HUYGENS

NASA PDS and ESA PSA Interface Control Document

Document No. : [HP-DISR-EAICD-1]

Issue/Rev. No.

Date : 30 Jan 2007

Page :

European Space Agency

Research and Science Support Department

Planetary Missions Division

Huygens-DISR

NASA PDS and ESA PSA Interface Control Document

[HP-DISR-EAICD-1]

Prepared by: Lisa McFarlane

Approved by: Martin Tomasko

Approved by: Lyle Huber

Table of Contents

1. Introduction

1.1 Purpose and Scope

The EAICD (Experimenter to Archive Interface Control Document) describes the DISR data and documentation submitted to the ESA PSA and the NASA PDS.

1.2 Contents

This document describes the data flow of the DISR instrument on the Huygens Probe. It includes information on how data were processed, formatted, labeled and uniquely identified. The document discusses general naming schemes for data volumes, data sets, data and label files. Standards used to generate the product are explained.

1.3 Intended Readership

The staff of archiving authority (Planetary Data System for NASA, Planetary Science Archive for ESA) design team and any potential user of the DISR data.

1.4 Applicable Documents

1.5 Relationships to Other Interfaces

This document completely describes the DISR data and documentation as submitted to the NASA PDS and ESA PSA. In the event that there is any conflict between this document and any other Cassini or Huygens data archiving document, this document will take precedence.

1.6 Acronyms and Abbreviations

ASCII = American Standard Code for Information Interchange
DCT = Discrete Cosine Transformation
DDB = Descent Data Broadcast
DISR = Descent Imager/Spectral Radiometer
DLIS = Downward-looking Infrared Spectrometer
DLV = Downward-looking Violet Photometer
DLVS = Downward-looking Visible Spectrometer
DTWG = Descent Trajectory Working Group
EAICD = Experimenter to Archive Interface Control Document
ESA = European Space Agency
ESOC = European Space Operation Center
HRI = High_Resolution Imager
IR = Infrared Wavelengths
ITAR = International Traffic and Arms Regulations
JPL = Jet Propulsion Laboratory
MRI = Medium Resolution Imager

NASA = National Aeronautics and Space Administration
N/A = not applicable or not available
PDF = Adobe Acrobat Format Documents
PDS = Planetary Data System
PNG = Portable Network Grahpics
PSA = Planetary Science Archive
SLI = Side-Looking Imager
SSL = Surface Science Lamp
T0 = time in the mission when pyros fire and the DDB is reset to 0
ULIS = Upward-looking Infrared Spectrometer
ULV = Upward-looking Violet Photometer
ULVS = Upward-looking Visible Spectrometer
XDR = External Data Representation Standard

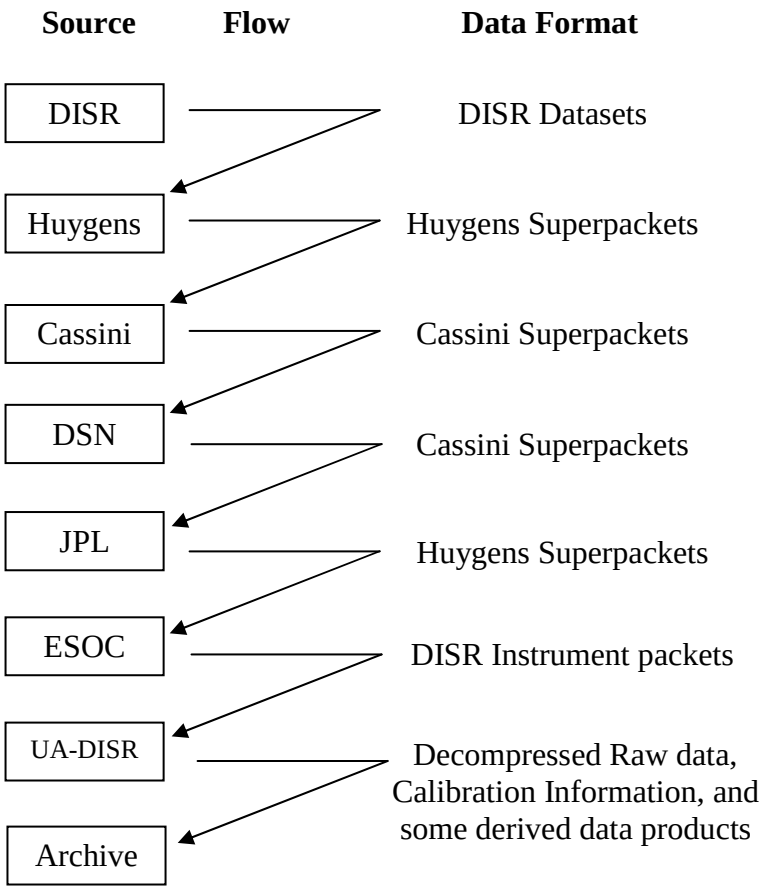
1.7 Contact Names and Addresses

Name	Affiliation	Phone #	email address
Lisa McFarlane	DISR	+1 520 621-8686	lmcfar@lpl.arizona.edu
Marty Tomasko	DISR	+1 520 621-6969	mtomasko@lpl.arizona.edu
Lyn Doose	DISR	+1 520 621-2127	ldoose@lpl.arizona.edu
Chuck See	DISR	+1 520 621-1097	csee@lpl.arizona.edu
Lyle Huber	PDS	+1 505 646-1862	lhuber@nmsu.edu
Diane Conner	JPL	+1 818 354-8586	Diane.Conner@jpl.nasa.gov
Jean-Pierre Lebreton	ESA	+31 71 565-3600	Jean-Pierre.Lebreton@rssd.esa.int

2. Overview of Process and Product Generation

The following chart describes the data flow from the Cassini spacecraft to the archive.

DISR Data Flow



DISR data is first processed on-board by the flight software. Various operations are performed (depending on the source of the data) to group the data into DISR data sets. This is explained in greater detail in the Experiment Users Manual (in the DOCUMENT folder called EXP_USERS_MANUAL_REV_C.PDF). For more information see also SP1177.PDF (in the DOCUMENTS folder) and Space Science Reviews 104: 469-551, 2002.

A data set is a single exposure of a single data product (data products are as defined in this document). A data cycle is a grouping of a set of measurements associated with a science goal. Thus, a group of data sets comprises a data cycle, which constitutes an organized group of measurements in close proximity of time and altitude. These sets are formatted into telemetry packets and delivered to the probe for transmission on one or both of the Huygens Probe's telemetry streams.

The Huygens Probe transmits the data to the Cassini Orbiter, which relays the data to the ground. The combined telemetry streams are delivered to ESOC, where they are distributed to the DISR team at the University of Arizona.

At the University of Arizona the telemetry is processed to reconstruct DISR data sets, which are expressed as data numbers

The data we will provide is at the 1b level, defined 'as data that have been sorted by instrument data types and instrument modes. Data are in scientifically useful form, such as images or individual spectra. These data are still uncalibrated'. DISR will include the raw data from the data stream converted into ASCII files when appropriate.

Thus, the archive will contain the decompressed data numbers and calibration reports. The calibration reports will contain all information necessary to obtain calibrated data. For detailed information see also SP1177.PDF (in the DOCUMENTS folder) and Space Science Reviews 104: 469-551, 2002.

Individuals involved in the generation of DISR data products are listed below.

* Note that all the below are in the Kuiper Space Sciences Building (#92) at the University of Arizona, Tucson Arizona

Name	Room	Responsibilities
Marty Tomasko	233	PI
Lyn Doose	239	Co-I
Bashar Rizk	213	Co-I
Chuck See	214	Engineering Operations
Mike Bushroe	235C	Telemetry Processing
Lisa McFarlane	235D	Analysis and Documentation
Steffi Engel	212	Data Analysis
Andrew Eibl	219	Data Analysis
Mike Prout	237	Management

2.1 Pre-Flight Data Products

No pre-flight data products or flight checkout data will be provided in accordance with this EAICD. All relevant information will be included in the calibration reports and/or white paper summaries.

2.2 Sub-System Tests

All relevant Sub-System Test data appear in the calibration reports or white paper summaries. No additional Sub-system data will be included.

2.3 Instrument Calibrations

The DISR PI will deliver calibration documents that clearly describe how to calibrate the raw data, approximately one per major instrument system. There is a calibration document for each major system listed below:

1) Imagers
2) Infrared Spectrometers
3) Solar Aureole
4) Sun Sensor
5) Surface Science Lamp
6) Violet Photometers
7) Visible Spectrometers and,
8) Calibration Standard

2.4 Other Files written during Calibration

The calibration reports and white paper summaries will contain all information necessary to obtain calibrated data.

2.5 In-Flight Data Products

Data will be organized as per the following categories and will be converted to ASCII, with the exception of the images. The images will be converted to 16 bit PNG format which should be identical to the 16 bit XDR images in use by the DISR team. Each image for the Image_Display product will be further converted to 8 bit PNG format, enlarged (x2), rotated and stretched for easier general viewing and access.

Data Product	Type	Comments
1) Dark	Text object	Dark exposures for each data cycle used to predict dark currents for items 4,7,8,12 and 13.
2) Descent	Text object	Header information for an entire cycle that is found nowhere else.
3) Hkeeping	Text object	Engineering data describing the internal function of the instrument and provide temperatures which are necessary for calibration.
4) Image	image object	Contains images of three main different types and sizes (High Resolution HRI: 160 by 256, Medium Resolution MRI: 176 by 256, Sidelooking SLI: 128 by 256)
5) Ir	Multiple Table objects	Infrared spectra (either the uplooking ULIS, downlooking DLIS or both in one)
6) Lamp	Text object	Information about the internal calibration lamps and the surface science lamp (SSL).
7) Solar	Table object	Solar Aureole data (24 or 4 by 50) divided into 4 channels (blue and red polarized horizontally and vertically)

8) Strip	Table object	A vertical strip from the right and left side of the sidelooking Imager (2 by 254).
9) Sun	Table object	Sun Sensor data (three time pulses and an amplitude, to determine spin rate, solar azimuth and solar zenith angles).
10) Time	Table object	Clock values (2 by 20) comparing probe mission time to DISR internal time.
11) Violet	Table object	Violet Photometer (either uplooking ULV or downlooking DLV). A single number.
12) Visible	Table object	Visible Spectra (either uplooking ULVS: always 2 by 200; or downlooking DLVS: variable by 200)
13) Visible_Ext	Table object	Reference measurements of stray light used with the visible data (always 2 by 200)

Elsewhere: Image_Display: Contains the same files as the Image directory, but converted to 8 bit PNG format, enlarged (x2) and stretched for easy viewing.

2.6 Software

N/A (No special software is needed since the data is provided in ASCII form or in industry standard TIFF or PNG files and the calibration documents do not require software). All information that is necessary to obtain calibrated data are provided in the calibration reports or white paper summaries. No special software is required to use the calibration documents or white paper summaries.

The DISR instrument calibration reports contain complete descriptions of each instrument detector system, the calibration data, methods, and algorithms for converting the instrument data numbers into physical units and intensities into data numbers.

Reduced mean intensities over the field of view (FOV) are provided for the spectrometers. However for the broad band instruments (imagers, SA camera) the mean intensity over the FOV is not a useful number since the spectral variation is important, and the bandpass changes significantly during the descent. It is felt that the best scientific approach is to create models which reproduce data numbers rather than mean intensities.

Although some lines of code exist as examples in the calibration reports, no generic calibration software is available. Interpretation of the DISR data is model dependent and selection of the model parameters (i.e. atmospheric composition, intensity spectrum, surface reflectance, variation over the field of view) is key in deciphering the data. The scientist is encouraged to develop their own software to explore the physical interpretations of the DISR data.

2.7 Documentation

The calibration reports or white paper summaries will contain all information necessary to obtain calibrated data. Calibration reports for each major DISR system will be provided in Adobe Acrobat PDF format with incorporated tables and figures as follows: 1) Imagers; 2) Solar Aureole; 3) Sun Sensor; 4) Surface Science Lamp; 5) Calibration Standard. White paper summaries will be provided in Adobe Acrobat PDF format with incorporated tables and figures for the following: 1) Infrared; 2) Violet; 3) Violet flux; 4) Visible.

The folder CALIBRATION_STANDARD contains the following three reports:
1) CALIBRATION_STANDARD_REVIEW, deals primarily with the monochrometer used in the absolute calibration of the DISR;
2) DARK_CURRENT, explains the method for determining dark current at a given time;
3) INTEGRATING_SPHERE_HOMOGENEITY, explores the uniformity of the light used for calibration.

Other documents include:
DOCINFO.TXT, describes all the documents in this section;
EAICD.PDF, which is this document;
EXP_USERS_MANUAL_REV_C.PDF, provides a detailed description of the DISR instrument (including, e.g., Science Overview, Instrument Overview, Operations, Instrument Commands, Software Architecture, Buffer Allocations, Bit Numbering, Telemetry Formats, etc. This document also provides an explanation of housekeeping information, e.g., ccd_flag, proc_flag, etc);
HEADER_DESCRIPTION.PDF, provides a description of the information that is associated with each data file in the header of the data;
IR_SW_AND_DATA_COLLECTION.DOC, provides a detailed explanation of the organization of the infrared data (including locations of shutter time, sample time, operation time, region, rotation, etc.).

The structure of the document section is shown below, and later in this document.

```
| - DOCUMENT
        | - BIBLIOGRAPHY
        | - DISR_CALIBRATION_DOCUMENTS
                | - CALIBRATION_STANDARD
                        | - CALIBRATION_STANDARD_REVIEW
                        | - DARK_CURRENT
                        | - INTEGRATING_SPHERE_HOMOGENEITY
                | - IMAGERS
                | - INFRARED_SPECTROMETERS
                | - SLI_STRIPS
                | - SOLAR_AUREOLE
```

| - SUN_SENSOR
| - SURFACE_SCIENCE_LAMP
| - VIOLET_PHOTOMETERS
| -VIOLET_FLUX_DETERMINATION
| -VIOLET_PHOTOMETER_CAL_DOC
| - VISIBLE_SPECTROMETERS
| - DISR SUPPORTING DOCUMENTS
| - EAICD
| - ESA_SP1177
| - DISR_INSTRUMENT
| - SUNLIGHT_PENETRATION_MODEL
| - EXPERIMENT_USERS_MANUAL
| - HEADER_DESCRIPTION
| - SPACE_SCIENCE_REVIEW
| - DOCINFO.TXT

2.8 Derived and other Data Products

Derived data products and schedules in support of the Descent Trajectory Working Group are presented in the DTWG archive.

The average intensity over the field of view is provided for the violet, visible and infrared systems. Also, mosaic presentations of the DISR images are provided as posters.

3. Archive Format and Content

3.1 Format and Conventions

3.1.1 Deliveries and Archive Volume Format

DISR will deliver the data to a PSA archive in electronic form within 18 months of the descent. Simultaneously the DISR team will deliver the data to the PDS in identical form. The proprietary period will extend for 18 months after the descent. During the proprietary period the data will not be disseminated without the approval of the DISR PI.

We anticipate that the DISR data will fit on one CD, and the calibration reports on another 2 CDs. Thus the logical archive volume would fit on one DVD. DISR will deliver the data to the PDS archive in electronic form and the archiving authority will write the physical volumes.

3.1.2 Data Set ID Formation

HP-SSA-DISR-2/3-EDR/RDR-V1.0

<Huygens Probe>-<Saturn Satellite>-<Descent Imager Spectral Radiometer>-<Level 2 is raw data>-<Experiment Data Record>-<version 1.0>

We will provide Level 2 data as defined in the table below:

Level Type	Data Processing Level Description
2	Edited Data Corrected for telemetry errors and split or decommutated into a data set for a given instrument. Sometimes called Experimental Data Record. Data are also tagged with time and location of acquisition. Corresponds to NASA Level 0 data.

3.1.3 Data Directory Naming Convention

The subdirectories will be named according to the data product. Data products are listed in section 2.5 of this document.

3.1.4 Filenaming Convention

1) DARK_0286_012044_2903.TAB
2) DESCENT_0286_012044_2903.TXT
3) HKEEPING_0286_012044_2903.TXT
4A) IMAGE_0286_012044_2903.IMG
4B) IMAGE_0286_012044_2903.TAB
5) IR_0286_012044_2903.TAB
6) LAMP_0286_012044_2903.TXT
7) SOLAR_0286_012044_2903.TAB
8) STRIP_0286_012044_2903.TAB
9) SUN_0286_012044_2903.TAB
10) TIME_0286_012044_2903.TAB
11) VIOLET_0286_012044_2903.TAB
12) VISIBLE_0286_012044_2903.TAB
13) VISIBLE_EX_0286_012044_2903.TAB (27.3)

In browse: IMG_DISPLY_0286_012044_2903.PNG

<data type>_<sequence number>_<mission time in hr min sec>_<fraction of a second>.<ext>

Where .TAB refers to a table, .TXT refers to text, .PNG refers to portable network graphics and .IMG is a non-compressed image file.

3.2 Standards Used in Data Product Generation

3.2.1 PDS Standards

We intend to comply with the PDS standards to the extent as defined in this document.

3.2.2 Time Standards

All start times are referenced to the probe on-board software mission time, T0. DISR mission time is synchronized to the Huygens probe mission timer T0.
An exception to this is for the first couple of message data products (which are generated before synchronization and are relative to when DISR was turned on. These first few messages are time stamped. Mission time is measured to 10 thousandths of a second.

3.2.3 Reference Systems

DISR derives azimuth information from the Sun Sensor instrument subsystem. The azimuth is measured relative to the sun in the instantaneous plane of the probe and is thus labeled an apparent solar azimuth angle.

All angles are measured within a right-handed system aligned to the Huygens Probe system, which is defined in the EID, Part A. Quoting from Issue 1, Rev 0, Sect. 3.1, page 3: "The Probe axes form a right-handed orthogonal system Xp, Yp, Zp that is fixed relative to the Probe geometry. The Probe Reference Frame has the same orientation as the Orbiter Reference Frame (i.e., no tilt angle). The
-Xp axis is pointing along the Probe centerline towards the nose of the Probe. The –Zp axis is pointing in the direction of the top SED strut. The origin of the Probe Reference Frame is on the lower side of the experiment platform (i.e., the side facing the Probe nose)."

The DISR mechanical system within which the apparent solar azimuth angle above is measured, is aligned to the Huygens Probe system described above but the origin of the DISR system is displaced from that of the Huygens system.

3.2.4 Other Applicable Standards

N/A

3.3 Data Validation

The internal validation of the scientific content will be performed by the science team. All DISR packets include Cyclic Redundancy Check codes. Packets with invalid codes are discarded. We will ensure data values are in the expected range and are valid numbers.

We agree to a peer review of the EAICD by a committee chaired by the Project Scientist and the PSA manager and consisting of the members of the HSWT, members of the DISR team and PSA and PDS personnel and to abide by their recommendations within the resources available.

3.4 Content

3.4.1 Volume Set

The DISR data set will be part of the Huygens Volume Set.

3.4.2 Data Set

All of the raw DISR data products (listed in section 2.5 of this document) will be combined to form one data set.

3.4.3 Directories

ROOT

```
| - BROWSE
        || - PNG
| - CATALOG
        || - CATINFO.TXT
        || - DATASET.CAT
        || - DISRINST.CAT
        || - INST_HOST.CAT
        || - MISSION.CAT
        || - PERSON.CAT
        || - REF.CAT
        || - (SOFT.CAT)
        || - (TARGET.CAT)
| - DATA
        || - DARK
        || - DERIVED_DATA_PRODUCTS
                ||| - DLIS
                ||| - DLV
                ||| - DLVS
                ||| - ULIS
                ||| - ULV
                ||| - ULVS
        || - DESCENT
        || - HIGHER_LEVEL_DATA
                ||| - POSTERS
        || - HKEEPING
        || - IMAGE
                ||| - IMG_FORMAT
                ||| - TABLE_FORMAT
        || - IR
        || - LAMP
        || - SOLAR
```

```
        || - STRIP
        || - SUN
        || - TIME
        || - VIOLET
        || - VISIBLE
        || - VISIBLE_EXT
| - DOCUMENT
        || - BIBLIOGRAPHY
        || - DISR_CALIBRATION_DOCUMENTS
                ||| - CALIBRATION_STANDARD
                        |||| - CALIBRATION_STANDARD_REVIEW
                        |||| - DARK_CURRENT
                        |||| - INTEGRATING_SPHERE_HOMOGENEITY
                ||| - IMAGERS
                ||| - INFRARED_SPECTROMETERS
                ||| - SLI_STRIPS
                ||| - SOLAR_AUREOLE
                ||| - SUN_SENSOR
                ||| - SURFACE_SCIENCE_LAMP
                ||| - VIOLET_PHOTOMETERS
                        |||| -VIOLET_FLUX_DETERMINATION
                        |||| -VIOLET_PHOTOMETER_CAL_DOC
                ||| - VISIBLE_SPECTROMETERS
        || - DISR SUPPORTING DOCUMENTS
                ||| - EAICD
                ||| - ESA_SP1177
                        |||| - DISR_INSTRUMENT
                        |||| - SUNLIGHT_PENETRATION_MODEL
                ||| - EXPERIMENT_USERS_MANUAL
                ||| - HEADER_DESCRIPTION
                ||| - SPACE_SCIENCE_REVIEW
        || - DOCINFO.TXT
| - EXTRAS
        || - MOSAICS
        || - MOVIES
                ||| - NARRATION_SCRIPTS
                ||| - TECH_MOVIE
                ||| - TITAN_DESCENT_MOVIE
        || - POSTERS
        || - PROBE_ATTITUDE
                ||| - DATA_AT_SOLAR_CROSSING
                ||| - HUYGENS_DESCENT_PARAMETERS
        || - PROCESSED IMAGES
                ||| - DISRSOFT_E_IMAGES
                ||| - DISRSOFT_G_IMAGES
                ||| - UNSMOOTHED_IMAGES
```

```
        || - RENDERINGS
| - INDEX
        || - INDEXINFO.TXT
        || - INDEX.LBL
        || - INDEX.TAB
| - AAREADME.TXT
| - ERRATA.TXT
| - VOLDESC.CAT
```

3.4.3.1 Root Directory

AAREADME.TXT	Volume Contents and format info in ASCII text format.
ERRATA.TXT	Cumulative listing of updates for all DISR volumes published thus far.
VOLDESC.CAT	Description of volume contents in a PDS format.

3.4.3.2 Calibration Directory

Detailed calibration reports will be provided for all the DISR Science instruments, approximately one per major instrument system as follows: 1) Imagers; 2) Infrared; 3) Solar Aureole; 4) Sun Sensor; 5) Surface Science Lamp; 6) Violet; 7) Visible; 8) Calibration Standard

3.4.3.3 Catalog Directory

CATINFO.TXT	ASCII description of the contents of this directory.
DATASET.CAT	Data set catalog object.
DISRINST.CAT	Instrument catalog object.
INST_HOST.CAT	Space craft catalog object (to be provided by ESA)
MISSION.CAT	Mission catalog object (to be provided by the Cassini Project)
PERSON.CAT	Listing of personnel involved in data production.
REF.CAT	References (published literature) catalog object.
SOFT.CAT	A placeholder since no software is archived.
(TARGET.CAT)	(to be provided by the ESA or the Cassini Project)

3.4.3.4 Index Directory

Index table of all label files this archive.

3.4.3.5 Browse Directory and Browse Files

We provide Thumbnails of all images in slightly modified raw form, in PNG format. The files are same images as are in the Image directory, but converted to 8 bit PNG format, enlarged by a factor of two and stretched for easy viewing. The directory contains about 600 images.

3.4.3.6 Geometry Directory

There is no Geometry Directory. Geometry data is included in the instrument calibration reports.

3.4.3.7 Software Directory

N/A - There is no software in the DISR archive. See section 2.6 for further discussion.

3.4.3.8 Gazetter Directory

N/A - There are no named features at this time.

3.4.3.9 Label Directory

There is no Label Directory. Label files are located with their targets in the DATA and DOCUMENT directories. The Index table shows the location of all label files.

3.4.3.10 Document Directory

Documents are provided in ASCII format. In most cases MS Word and Adobe PDF files are also available. The Calibration Reports are located in the Document directory. Other documents included in this directory are the DISR EAICD, Header Description, Users Manual, mission description documents and Bibliography.

3.4.3.11 Extras Directory

The Extras Directory contains six subdirectories:

1) MOSAICS: Assemblages of the DISR images to create views of Titan's surface. Filenames with numbers represent the resolution in meters/pixel (i.e. 4.png is a mosaic with 4 m/pixel resolution). These depictions were made using FORTRAN by Erich Karkoschka. The other 3 files (HIGH..., MEDIUM..., & TITAN.PNG) are earlier, hand made mosaics.

2) MOVIES: Two types of movies inhabit this directory.

The Titan Descent Movies are an extension of Erich's mosaic work. There are sequenced frames of mosaics at increasingly higher resolution (starting out with frames which orient the viewer from the Mees Solar Observaroty). A detailed description exists in the TITAN_DESCENT_MOVIE directory(TITAN_DESCENT_MOVIE.TXT). The Narration Scripts also describe these movies.

The Tech Movie combines all of the DISR data into one graphic dynamic display (with sound). A detailed description exists in the TECH_MOVIE directory as DESCRIPTION_OF_TECH_MOVIE.TXT.

3) POSTERS: This directory contains a variety of views of Titans surface as seen by the Huygens probe during the descent. Various projections at distinct altitudes are presented. There is more detailed description in the file TITAN_POSTERS_DESCRIPTION

4) PROBE_ATTITUDE: Measurements of the sun's position, and movement of features on Titan's surface allowed us to make of estimates of the Huygens probe's attitude and position during the descent. This information is provided in tabular form in this directory.

5) PROCESSED_IMAGES: The individual images taken by the DISR are presented in this directory with 3 levels of processing. The most basic (Unsmoothed Images) just have camera defects removed. The next step (E-Images) includes compressor artifact removal and some smoothing, while the G-Images also have geometric distortions removed and are photometrically normalized.

6) RENDERINGS: Movies of stereographic renderings of Titan's surface created by USGS using the DISR images.

3.4.3.12 Data Directory

The data directory will is organized according to the directory levels as listed in section 2.5 of this document.

4. Detailed Interface Specifications

4.1 Structure and Organization Overview

See preceding section.

4.2 Data Product Design

The data products will be in ASCII format, with the exception of the Image and Image_Display which will be in PNG format. Software will not be provided. There are often several types of data files within each data product type (such as with a different number of columns). The following lists each data product type, followed by a brief

description, with dimensions shown in parentheses where appropriate. For more specific details see the disrinst.cat, the Experiment Users Manual or the Space Science Reviews paper listed in the Bibliography.

1) Dark: Dark exposures for each data cycle (2 by 256) are from 4 adjacent columns on the CCD covered by an opaque coating. The first dark column is DN values for columns 7 and 8 summed, and the second dark column is DN values for columns 9 and 10 summed.

2) Descent: Header information for an entire cycle that is found nowhere else. Lists cycle types, start times, etc. The altitude entry is from real-time data and is not necessarily correct.

3) Hkeeping: Engineering data to check the internal function of the instrument. This is the only place where some types of temperature data exist (e.g. Electronics Assembly (EA) or Optics temperature specifically).

4) Image: Contains images of three main different types and sizes (HRI: 160 by 256 pixels, MRI: 176 by 256, SLI: 128 by 256). In addition, some images can be half this size, that is the number of columns by 128 (or half of 256 rows). The top and bottom row are copies of adjacent rows as the total number of rows needed to be a multiple of 16 to work with the data compressor. These will be provided in PNG format. Data will be in DN and will include exposure time.

5) Ir: Infrared spectra, either the ULIS (2 by 150), DLIS (2 by 150) or IR combined (24 by 150). Data will be a table of DN and will include sufficient information to compute effective exposure times.

6) Lamp: Current and Voltage Information about the internal calibration lamps and the SSL.

7) Solar: Solar Aureole data (24 or 4 by 50) divided into 4 channels (blue and red horizontal and vertical). The 4 by 50 array is summed within each of the 4 channels. Data will be in DN and will include exposure time.

8) Strip: A vertical strip from the right and left side of the SLI Imager (2 by 254). Data will be in DN and will include exposure time.

9) Sun: Sun Sensor data (three time pulses and an amplitude). Pulse time is in seconds, amplitude is in DN. There are three slits in the Sun Sensor, and so as the image of the sun crosses the slit, one pulse per slit. This data is used to determine the azimuth and rotation rate of the probe, as well as the zenith angle of the sun. There are a variable number of measurements in a file.

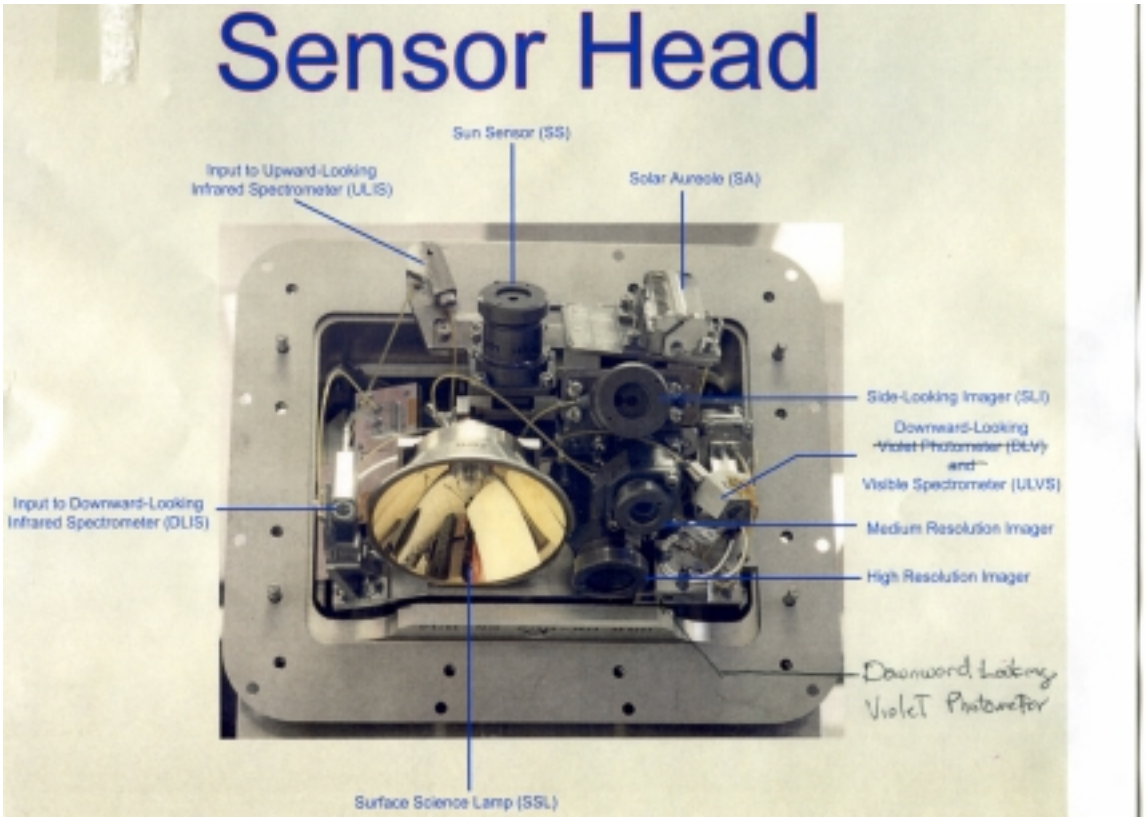
10) Time: Time values (2 by 20) comparing probe mission time to DISR internal time. It is used to record the correlation between mission time from the probe that is sent to DISR in the probe broadcast messages and the master time which is kept by a hardware clock. Broadcast time is mission time from the DDB in 0.0001 second increments from the beginning of the mission. The master time corresponds to mission time and is also in 0.0001 second increments. Since the DISR is powered-on post T0, the broadcast time from the probe is always the larger value.

11) Violet: Violet Photometer (either ULV or DLV). A single number. data will be in DN. The violet photometers are instruments that are reading continuously, so there is no exposure time or integration time.

12) Visible: Visible Spectra (either ULVS: always 2 by 200; or DLVS: 2, 5, 10 or 20 by 200). For DLVS, the 20 by 200 is unsummed. Otherwise, 10, 5 and 2 adjacent columns are summed for arrays with 2, 5 and 10 DLVS columns. Data will be in DN and will include exposure time.

13) Visible_Ext: Reference measurements of scattered light used with the visible data. This measures instrument crosstalk. This uses otherwise unused columns between the ULVS/DLVS and DLVS/Imagers. The dimensions are always 2 by 200. Data will be in DN and will include exposure time.

In the Browse directory: Image_Display contains the same files as the Image directory, but converted to 8 bit PNG format enlarged (x2) and stretched.

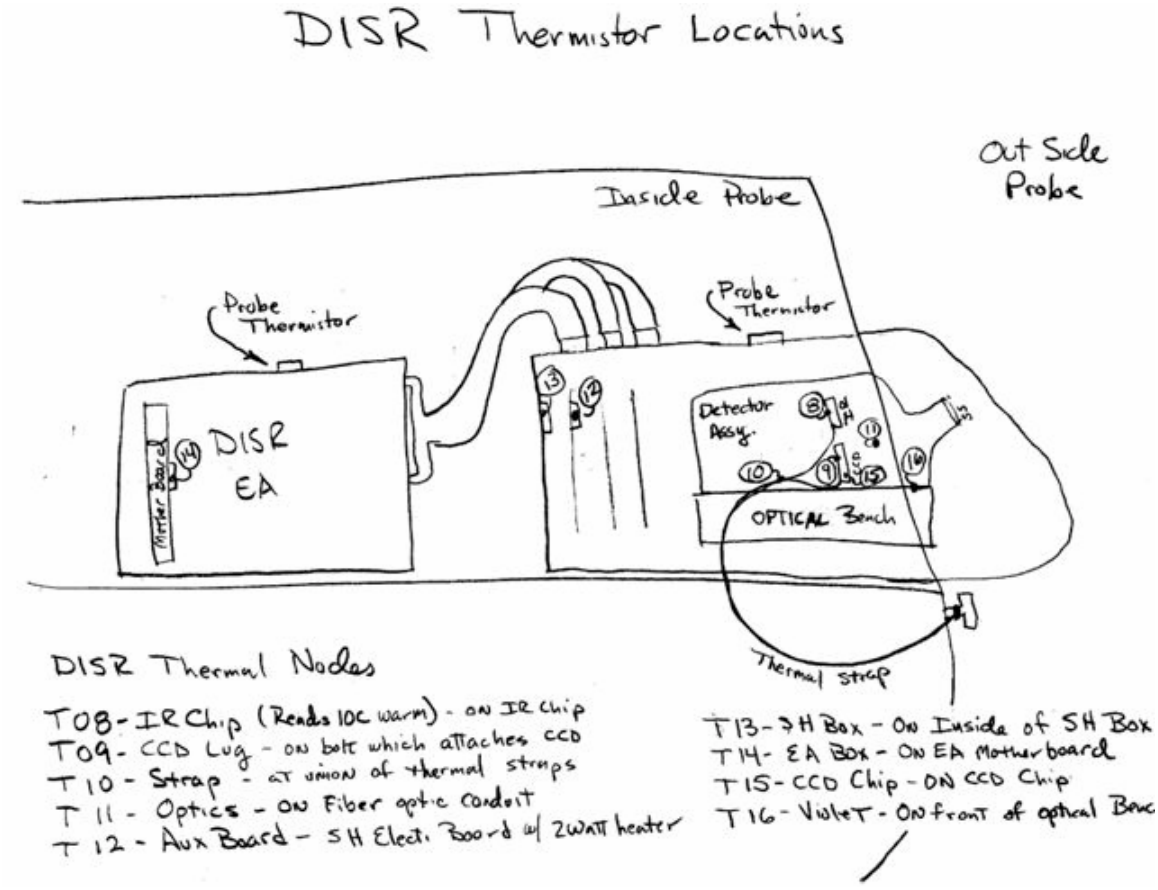


Some of the labels include a temperature array, referred to as the keyword INSTRUMENT_TEMPERATURE. The following is a description of each of the positions within this array, referred to as INSTRUMENT_TEMPERATURE_POINT.

4.4 Instrument Temperature (Thermistor Reading) Description

ccd_t1	CCD Chip - On edge of CCD chip (part of the chip).
ref_t2	Near CCD chip - MPAE reference.
irb_t3	IR Chip, beginning - Near the thermal strap to detector lug (biased +10C)*
ire_t4	IR Chip, ending - Near the thermal strap to detector lug (biased +10C)*
ccdlug_t5	CCD Lug - Where the thermal strap meets the CCD.
strap_t6	Strap - At strap split (IR/CCD), near DISR Strap Heater (not powered).
optics_t7	Optics - On fiber optic conduit, about 1/3 way from CCD to Optics.
violet_t8	Violet - Towards the Front of the optical bench, near cover (cooler).
sh_aux_t9	Aux Board - On SH Aux. Circuit Card, near heater (not powered).
sh_box_t10	SH Box - On Sensor Head (SH) back cover (facing EA), warm part of SH.
ea_box_t11	EA Box - In Electronics Ass'y (EA), on Motherboard (warm, lags housing)

* The temperature (thermistor reading) in this keyword is too high by +10 K because of the sensor bias. Note that these are all thermistor readings and **not** calibrated temperatures. A value of 47 corresponds to Absolute Responsivity Calibration.



4.5 Solar Aureole Columns, Rows, Filters, and Polarization

For DISR#3 the correspondence between columns and rows in a Solar Aureole data set and a Full data set are as follows:

Rows 0:49 in a Solar Aureole data set correspond to rows 204:253 in a Full data set.

SA data set columns	0:5	6:11	12:17	18:23
Full data set columns *	40:45	31:36	23:28	14:19
Filter	Blue	Blue	Red	Red
Polarization	Horizontal	Vertical	Vertical	Horizontal

* refers to full CCD output used during calibration; not applicable to Titan descent

4.6 Description of Possible values for Detector_ID keyword

UPPER HALF HRI: The upper half of the high resolution imager.
UPPER HALF MRI: The upper half of the medium resolution imager.
UPPER HALF SLI: The upper half of the side-looking imager.
LOWER HALF HRI: The lower half of the high resolution imager.
LOWER HALF MRI: The lower half of the medium resolution imager.
LOWER HALF SLI: The lower half of the side-looking imager.
DOWN LOOKING VIOLET: The downward looking violet photometer.
UP LOOKING VIOLET: The upward looking violet photometer.
DOWN LOOKING IR: The downward looking infrared spectrometer.
UP LOOKING IR: The upward looking infrared spectrometer.
IR_COMBINED: The infrared spectrometers combined, a 24 by 150 array including shutter closed and shutter open values.
IR_LONG: The long version of the infrared spectrometers.
DOWN LOOKING VISIBLE: Downward looking visible spectrometer is either 2, 5 10 or 20 by 200, where the 20 by 200 is unsummed.
UP LOOKING VISIBLE: Upward looking visible spectrometer, is always 2 by 200.
MRI: Medium resolution imager, is 176 by 256 pixels.
SLI: Side-looking imager, is 128 by 256 pixels.
HRI: High resolution imager is 160 by 256 pixels.
DOWN LOOK VISIBLE EX: Extra columns from the downward looking visible spectrometer.
UP LOOK VISIBLE EX: Extra columns from the downward looking visible spectrometer.

4.7 Description of Possible values for Cycle Type

(Cycle type is found, for example, in the Descent data set.)

1=Standard non-image
2=Standard image
3=Flat Field
4=Cal Cycle A
5=Cal Cycle B
6=Cal Cycle C
8=Dark current only
9=Spectrophotometric
10=Drain cycle
11=High near surface
12=Medium near surface
13=Low near surface
14=Very low near surface
15=Surface A
16=Surface B
17=Surface C
18=Surface D

4.3 SAMPLE LABELS

4.3.1 DARK LABEL

```
SAMPLE DARK

PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE          = "Tue Oct 03 00:07:57 2006 <UTC>, C. See"

RECORD_TYPE                  = FIXED_LENGTH
RECORD_BYTES                 = 22
FILE_RECORDS                 = 256

^TABLE                       = "DARK_0001_000310_5941.TAB"

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00001K_MMX_00-03-10_5941_DRK"
MISSION_NAME                 = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME         = "HUYGENS PROBE"
INSTRUMENT_HOST_ID           = HP
TARGET_NAME                  = TITAN
MISSION_PHASE_NAME           = DESCENT
INSTRUMENT_ID                = DISR
INSTRUMENT_NAME              = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE              = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                  = DISR
PRODUCER_INSTITUTION_NAME    = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME           = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                 = EDR
START_TIME                   = 2005-01-14T09:13:31.594
STOP_TIME                    = 2005-01-14T09:13:31.604
SPACECRAFT_CLOCK_START_COUNT = 190.594    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT  = 190.604    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME        = 2006-10-03T00:07:57 /*UTC*/

FILE_NAME                    = "DARK_0001_000310_5941.TAB"
EXPOSURE_DURATION            = 10.0000 <MILLISECONDS>
SPACECRAFT_ALTITUDE          = 140.34 <KM>
```

```
AZIMUTH                        =  33.39 <DEGREES>
HUYGENS:EW_TILT_ANGLE          =   3.96 <DEGREES>
INSTRUMENT_TEMPERATURE         = (259.1, "UNK", "UNK",
                                  "UNK", 266.5, "UNK",
                                  "UNK", "UNK", "UNK",
                                  "UNK", "UNK")
                                  /* KELVIN */
INSTRUMENT_TEMPERATURE_POINT   = ("CCD_T1","REF_T2","IRB_T3",
                                  "IRE_T4","CCDLUG_T5","STRAP_T6",
                                  "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                  "SH_BOX_T10","EA_BOX_T11")
LAMP_STATE                     = 0000
NATIVE_START_TIME              = 190.5941   <SECONDS>
NATIVE_STOP_TIME               = 190.6041   <SECONDS>

DESCRIPTION =
"A 2 by 256 array of dark measurements from the ccd.
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Dark\
filename: V_00001K_MMX_00%03%10_5941_Drk
dimensions:   2
num_cols:   2
num_rows:  256
date_replayed: Sun Jan 16 17:32:37 2005
set_name: Dark
ccd_t1:  259.1
detector: CCD
exp_time:    10.00 ms
coord_x2:  10
coord_y2:   0
coord_x:   8
coord_y:   0
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
units: dn
seq_num:      1
m_time:    190.59
cycle_num:    1
type:   18
```

```
altitude (km):   140.343
target_az:   180.000
actual_az:    33.387
lamp: 0000
ccd_stat:    0
ccd_flag: 1110
proc_flag: 111000
cols_sent:    2
null_col2:   86.0000
null_col3:   81.0000
ccdlug_t5:   266.500
"

OBJECT                        = TABLE

  INTERCHANGE_FORMAT            = ASCII
  COLUMNS                       = 3
  ROWS                          = 256
  ROW_BYTES                     = 22
  DESCRIPTION                   = "TWO SUMMED COLUMNS OF DARK VALUES
                                   FROM THE CCD"

  OBJECT                        = COLUMN
    NAME                        = "ROW"
    COLUMN_NUMBER               = 1
    UNIT                        = "N/A"
    DATA_TYPE                   = INTEGER
    START_BYTE                  = 1
    BYTES                       = 4
    FORMAT                      = "I4"
    DESCRIPTION                 = "ROW"
  END_OBJECT                    = COLUMN

  OBJECT                        = COLUMN
    NAME                        = "DARK1"
    COLUMN_NUMBER               = 2
    UNIT                        = "DN"
    DATA_TYPE                   = INTEGER
```

```
    START_BYTE                  = 5
    BYTES                       = 8
    FORMAT                      = "I8"
    DESCRIPTION                 = "THE SUM OF CCD COLUMNS 7 & 8"
  END_OBJECT                    = COLUMN

  OBJECT                        = COLUMN
    NAME                        = "DARK2"
    COLUMN_NUMBER               = 3
    UNIT                        = "DN"
    DATA_TYPE                   = INTEGER
    START_BYTE                  = 13
    BYTES                       = 8
    FORMAT                      = "I8"
    DESCRIPTION                 = "THE SUM OF CCD COLUMNS 9 & 10"
  END_OBJECT                    = COLUMN

END_OBJECT                    = TABLE

END

SAMPLE DARK DATA PRINTOUT

   1      20      21
   2      20      22
   3      21      21
   4      20      22
   5      21      22
to row:   256
```

4.3.2 DESCENT LABEL

```
SAMPLE DESCENT

PDS_VERSION_ID                = PDS3
LABEL_REVISION_NOTE           = "Tue Oct 03 00:08:05 2006 <UTC>, C. See"

RECORD_TYPE                   = STREAM
```

```
FILE_RECORDS                 = 16

^TEXT                        = "DESCENT_0001_000222_5863.TXT"

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00001D_MMX_00;02;22_5863_DST"
MISSION_NAME                 = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME         = "HUYGENS PROBE"
INSTRUMENT_HOST_ID           = HP
TARGET_NAME                  = TITAN
MISSION_PHASE_NAME           = DESCENT
INSTRUMENT_ID                = DISR
INSTRUMENT_NAME              = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE              = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                  = DISR
PRODUCER_INSTITUTION_NAME    = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME           = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                 = EDR
START_TIME                   = 2005-01-14T09:12:43.586
STOP_TIME                    = "N/A"
SPACECRAFT_CLOCK_START_COUNT = 142.586    /* DDB time in seconds.fff when cycle begins */
SPACECRAFT_CLOCK_STOP_COUNT  = "N/A"
PRODUCT_CREATION_TIME        = 2006-10-03T00:08:05 /*UTC*/

FILE_NAME                    = "DESCENT_0001_000222_5863.TXT"
SPACECRAFT_ALTITUDE          = 142.82 <KM>
AZIMUTH                      = 127.94 <DEGREES>
NATIVE_START_TIME            = 142.5863   <SECONDS>
NATIVE_STOP_TIME             = "N/A"

DESCRIPTION = "
A text file with 16 lines describing current descent cycle parameters.
"

OBJECT                      = TEXT
NOTE                        = "DISR DESCENT"
PUBLICATION_DATE            = 2006-10-03
END_OBJECT                  = TEXT
```

```
END

SAMPLE DESCENT DATA PRINTOUT

filename_pre: Z:\Log\stream_524a_alt_az_5-8-2006\DB\Descent\
filename: V_00001D_MMX_00%02%22_5863_Dst
date_taken: 2005-01-14T09:12:43.586
set_name: Descent
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
seq_num:       1
m_time:     142.59 seconds
cycle_num:     1
cycle_type:    2 (Standard image)
scen_step:    14 (cycle specifics)
spm_flag:      0
az_cycle_start:  111 (degrees, software value, not actual)
altitude:    142820 meters
altitude:   142.821 Kilometers
spin:         9.92 RPM

4.3.3 HKEEPING LABEL

SAMPLE HKEEPING

PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE          = "Tue Oct 03 00:08:13 2006 <UTC>, C. See"

RECORD_TYPE                  = STREAM
FILE_RECORDS                 = 28

^TEXT                        = "HKEEPING_0001_000442_0074.TXT"

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00001H_MMX_00|04|42_0074_HKP"
MISSION_NAME                 = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME         = "HUYGENS PROBE"
```

```
INSTRUMENT_HOST_ID            = HP
TARGET_NAME                   = TITAN
MISSION_PHASE_NAME            = DESCENT
INSTRUMENT_ID                 = DISR
INSTRUMENT_NAME               = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE               = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCT_TYPE                  = EDR
PRODUCER_ID                   = DISR
PRODUCER_INSTITUTION_NAME     = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME            = "DR. ELISABETH MCFARLANE"
START_TIME                    = 2005-01-14T09:15:03.007
STOP_TIME                     = 2005-01-14T09:15:03.007
SPACECRAFT_CLOCK_START_COUNT  = 282.007    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 282.007    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME         = 2006-10-03T00:08:13 /*UTC*/

FILE_NAME                     = "HKEEPING_0001_000442_0074.TXT"
SPACECRAFT_ALTITUDE           = 135.93 <KM>
INSTRUMENT_TEMPERATURE        = (259.5, "UNK", "UNK",
                                 "UNK", 261.8, 259.0,
                                 264.1, 263.7, 275.7,
                                 274.0, 287.2)
                                 /* KELVIN */
INSTRUMENT_TEMPERATURE_POINT  = ("CCD_T1","REF_T2","IRB_T3",
                                 "IRE_T4","CCDLUG_T5","STRAP_T6",
                                 "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                 "SH_BOX_T10","EA_BOX_T11")
NATIVE_START_TIME             = 282.0074   <SECONDS>
NATIVE_STOP_TIME              = 282.0074   <SECONDS>

DESCRIPTION = "A text file containing 27 elements that describe the DISRs
condition including temperatures, voltages and processor performance."

OBJECT                       = TEXT
NOTE                         = "DISR HOUSEKEEPING"
PUBLICATION_DATE             = 2006-10-03
END_OBJECT                   = TEXT
```

```
END

SAMPLE HKEEPING DATA PRINTOUT

filename_pre: Z:\Log\stream_524a_alt_az_5-8-2006\DB\HKeeping\
filename: V_00001H_MMX_00%04%42_0074_Hkp
date_taken: 2005-01-14T09:15:03.007
set_name: HKeeping
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
seq_num:      1

m_time:           282.01 seconds
altitude (km):    135.935
t_sensor_curr:    0.00204600 amps
ccd_t1:        259.50 degK
ccdlug_t5:     261.8 degK
strap_t6:      259.0 degK
optics_t7:     264.1 degK
violet_t8:     263.7 degK
sh_aux_t9:     275.7 degK
sh_box_t10:    274.0 degK
ea_box_t11:    287.2 degK
aux_brd_volt:       11.9311 volts
cpu_brd_volt:       4.96505 volts
adc_offset:      0.00244000 volts
adc_gain:          0.000000
dispq_size:          6
alrmq_size:         10
tlmq_size:           0
sciprq_size:         5
stack_size:       1471
```

4.3.4 IMAGE LABEL

SAMPLE IMAGE

```
PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE          = "Tue Oct 03 00:08:17 2006 <UTC>, C. See"

RECORD_TYPE                  = FIXED_LENGTH
RECORD_BYTES                 = 898
FILE_RECORDS                 = 256

^TABLE                       = "IMAGE_0002_000223_5790.TAB"

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00002I_MMX_00=02=23_5790_IMG"
MISSION_NAME                 = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME         = "HUYGENS PROBE"
INSTRUMENT_HOST_ID           = HP
TARGET_NAME                  = TITAN
MISSION_PHASE_NAME           = DESCENT
INSTRUMENT_ID                = DISR
INSTRUMENT_NAME              = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE              = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                  = DISR
PRODUCER_INSTITUTION_NAME    = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME           = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                 = EDR
START_TIME                   = 2005-01-14T09:12:44.579
STOP_TIME                    = 2005-01-14T09:12:44.586
SPACECRAFT_CLOCK_START_COUNT = 143.579    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT  = 143.586    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME        = 2006-10-03T00:08:17 /*UTC*/

FILE_NAME                    = "IMAGE_0002_000223_5790.TAB"
EXPOSURE_DURATION            = 7.00000 <MILLISECONDS>
SPACECRAFT_ALTITUDE          = 142.77 <KM>
AZIMUTH                      = 157.44 <DEGREES>
HUYGENS:EW_TILT_ANGLE        =   6.57 <DEGREES>
INSTRUMENT_TEMPERATURE       = (258.7, "UNK", "UNK",
                                "UNK", 266.1, "UNK",
                                "UNK", "UNK", "UNK",
                                "UNK", "UNK")
```

```
                                 /* KELVIN */
INSTRUMENT_TEMPERATURE_POINT  = ("CCD_T1","REF_T2","IRB_T3",
                                 "IRE_T4","CCDLUG_T5","STRAP_T6",
                                 "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                 "SH_BOX_T10","EA_BOX_T11")
LAMP_STATE                    = 0000
NATIVE_START_TIME             = 143.5790   <SECONDS>
NATIVE_STOP_TIME              = 143.5860   <SECONDS>
DETECTOR_ID                   = "SLI"

DESCRIPTION = "
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Image\
filename: V_00002I_MMX_00%02%23_5790_Img
dimensions:      2
num_cols:      128
num_rows:      256
date_replayed: Sun Jan 16 17:32:37 2005
ccd_t1:        258.70
detector:      CCD
exp_time:         7.00 ms
coord_x:      361
coord_y:        0
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
units:          dn
seq_num:           2
m_time:          143.58
cycle_num:         1
type:             22
altitude (km):   142.774
target_az:      152.000
actual_az:      157.436
lamp:           0000
ccd_stat:          0
dcs_stat:          1
ccd_flag:       1110
proc_flag:    100111
null_col2:     79
```

```
null_col3:     76
ccd_tgt_pct:   60
ccd_prctile:   97
ccdlug_t5:    266.1
sqrt_min:      286
sqrt_max:     1738
"

OBJECT                    = TABLE

  INTERCHANGE_FORMAT      = ASCII
  COLUMNS                 = 128
  ROWS                    = 256
  ROW_BYTES               = 898
  DESCRIPTION             = "SLI READING FOR EACH PIXEL
                             IN DATA NUMBERS (DN)."

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 0"
    COLUMN_NUMBER           = 1
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 1
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 1"
    COLUMN_NUMBER           = 2
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 8
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
  NAME                  = "COLUMN 2"
  COLUMN_NUMBER         = 3
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 15
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 3"
  COLUMN_NUMBER         = 4
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 22
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 4"
  COLUMN_NUMBER         = 5
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 29
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 5"
  COLUMN_NUMBER         = 6
  UNIT                  = "DN"
```

```
    DATA_TYPE               = INTEGER
    START_BYTE              = 36
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 6"
    COLUMN_NUMBER           = 7
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 43
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 7"
    COLUMN_NUMBER           = 8
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 50
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 8"
    COLUMN_NUMBER           = 9
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 57
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
```

```
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 9"
    COLUMN_NUMBER           = 10
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 64
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 10"
    COLUMN_NUMBER           = 11
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 71
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 11"
    COLUMN_NUMBER           = 12
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 78
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 12"
    COLUMN_NUMBER           = 13
```

```
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 85
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 13"
    COLUMN_NUMBER           = 14
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 92
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 14"
    COLUMN_NUMBER           = 15
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 99
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 15"
    COLUMN_NUMBER           = 16
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 106
    BYTES                   = 7
    FORMAT                  = "I7"
```

```
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 16"
    COLUMN_NUMBER            = 17
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 113
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 17"
    COLUMN_NUMBER            = 18
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 120
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 18"
    COLUMN_NUMBER            = 19
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 127
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 19"
```

```
    COLUMN_NUMBER           = 20
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 134
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 20"
    COLUMN_NUMBER           = 21
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 141
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 21"
    COLUMN_NUMBER           = 22
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 148
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 22"
    COLUMN_NUMBER           = 23
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 155
    BYTES                   = 7
```

```
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 23"
    COLUMN_NUMBER          = 24
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 162
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 24"
    COLUMN_NUMBER          = 25
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 169
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 25"
    COLUMN_NUMBER          = 26
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 176
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
```

```
    NAME                    = "COLUMN 26"
    COLUMN_NUMBER           = 27
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 183
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 27"
    COLUMN_NUMBER           = 28
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 190
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 28"
    COLUMN_NUMBER           = 29
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 197
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 29"
    COLUMN_NUMBER           = 30
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 204
```

```
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 30"
    COLUMN_NUMBER            = 31
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 211
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 31"
    COLUMN_NUMBER            = 32
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 218
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 32"
    COLUMN_NUMBER            = 33
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 225
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN
```

```
OBJECT                  = COLUMN
  NAME                  = "COLUMN 33"
  COLUMN_NUMBER         = 34
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 232
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 34"
  COLUMN_NUMBER         = 35
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 239
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 35"
  COLUMN_NUMBER         = 36
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 246
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 36"
  COLUMN_NUMBER         = 37
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
```

```
    START_BYTE              = 253
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 37"
    COLUMN_NUMBER           = 38
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 260
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 38"
    COLUMN_NUMBER           = 39
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 267
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 39"
    COLUMN_NUMBER           = 40
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 274
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
  NAME                  = "COLUMN 40"
  COLUMN_NUMBER         = 41
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 281
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 41"
  COLUMN_NUMBER         = 42
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 288
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 42"
  COLUMN_NUMBER         = 43
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 295
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 43"
  COLUMN_NUMBER         = 44
  UNIT                  = "DN"
```

```
    DATA_TYPE               = INTEGER
    START_BYTE              = 302
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 44"
    COLUMN_NUMBER           = 45
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 309
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 45"
    COLUMN_NUMBER           = 46
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 316
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 46"
    COLUMN_NUMBER           = 47
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 323
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
```

```
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 47"
    COLUMN_NUMBER           = 48
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 330
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 48"
    COLUMN_NUMBER           = 49
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 337
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 49"
    COLUMN_NUMBER           = 50
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 344
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 50"
    COLUMN_NUMBER           = 51
```

```
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 351
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 51"
    COLUMN_NUMBER           = 52
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 358
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 52"
    COLUMN_NUMBER           = 53
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 365
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 53"
    COLUMN_NUMBER           = 54
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 372
    BYTES                   = 7
    FORMAT                  = "I7"
```

```
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 54"
    COLUMN_NUMBER            = 55
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 379
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 55"
    COLUMN_NUMBER            = 56
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 386
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 56"
    COLUMN_NUMBER            = 57
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 393
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 57"
```

```
    COLUMN_NUMBER           = 58
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 400
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 58"
    COLUMN_NUMBER           = 59
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 407
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 59"
    COLUMN_NUMBER           = 60
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 414
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 60"
    COLUMN_NUMBER           = 61
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 421
    BYTES                   = 7
```

```
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 61"
    COLUMN_NUMBER          = 62
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 428
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 62"
    COLUMN_NUMBER          = 63
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 435
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 63"
    COLUMN_NUMBER          = 64
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 442
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
```

```
    NAME                    = "COLUMN 64"
    COLUMN_NUMBER           = 65
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 449
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 65"
    COLUMN_NUMBER           = 66
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 456
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 66"
    COLUMN_NUMBER           = 67
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 463
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 67"
    COLUMN_NUMBER           = 68
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 470
```

```
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 68"
    COLUMN_NUMBER          = 69
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 477
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 69"
    COLUMN_NUMBER          = 70
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 484
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 70"
    COLUMN_NUMBER          = 71
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 491
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN
```

```
OBJECT                  = COLUMN
  NAME                  = "COLUMN 71"
  COLUMN_NUMBER         = 72
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 498
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 72"
  COLUMN_NUMBER         = 73
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 505
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 73"
  COLUMN_NUMBER         = 74
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 512
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 74"
  COLUMN_NUMBER         = 75
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
```

```
    START_BYTE              = 519
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 75"
    COLUMN_NUMBER           = 76
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 526
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 76"
    COLUMN_NUMBER           = 77
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 533
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 77"
    COLUMN_NUMBER           = 78
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 540
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
  NAME                  = "COLUMN 78"
  COLUMN_NUMBER         = 79
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 547
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 79"
  COLUMN_NUMBER         = 80
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 554
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 80"
  COLUMN_NUMBER         = 81
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 561
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 81"
  COLUMN_NUMBER         = 82
  UNIT                  = "DN"
```

```
    DATA_TYPE               = INTEGER
    START_BYTE              = 568
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 82"
    COLUMN_NUMBER           = 83
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 575
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 83"
    COLUMN_NUMBER           = 84
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 582
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 84"
    COLUMN_NUMBER           = 85
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 589
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
```

```
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 85"
    COLUMN_NUMBER           = 86
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 596
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 86"
    COLUMN_NUMBER           = 87
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 603
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 87"
    COLUMN_NUMBER           = 88
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 610
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 88"
    COLUMN_NUMBER           = 89
```

```
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 617
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 89"
    COLUMN_NUMBER           = 90
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 624
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 90"
    COLUMN_NUMBER           = 91
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 631
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 91"
    COLUMN_NUMBER           = 92
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 638
    BYTES                   = 7
    FORMAT                  = "I7"
```

```
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 92"
    COLUMN_NUMBER            = 93
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 645
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 93"
    COLUMN_NUMBER            = 94
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 652
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 94"
    COLUMN_NUMBER            = 95
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 659
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "COLUMN 95"
```

```
    COLUMN_NUMBER           = 96
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 666
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 96"
    COLUMN_NUMBER           = 97
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 673
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 97"
    COLUMN_NUMBER           = 98
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 680
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 98"
    COLUMN_NUMBER           = 99
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 687
    BYTES                   = 7
```

```
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 99"
    COLUMN_NUMBER          = 100
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 694
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 100"
    COLUMN_NUMBER          = 101
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 701
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
    NAME                   = "COLUMN 101"
    COLUMN_NUMBER          = 102
    UNIT                   = "DN"
    DATA_TYPE              = INTEGER
    START_BYTE             = 708
    BYTES                  = 7
    FORMAT                 = "I7"
    DESCRIPTION            = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT               = COLUMN

  OBJECT                   = COLUMN
```

```
    NAME                    = "COLUMN 102"
    COLUMN_NUMBER           = 103
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 715
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 103"
    COLUMN_NUMBER           = 104
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 722
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 104"
    COLUMN_NUMBER           = 105
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 729
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 105"
    COLUMN_NUMBER           = 106
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 736
```

```
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 106"
    COLUMN_NUMBER           = 107
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 743
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 107"
    COLUMN_NUMBER           = 108
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 750
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 108"
    COLUMN_NUMBER           = 109
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 757
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN
```

```
  OBJECT                      = COLUMN
    NAME                      = "COLUMN 109"
    COLUMN_NUMBER             = 110
    UNIT                      = "DN"
    DATA_TYPE                 = INTEGER
    START_BYTE                = 764
    BYTES                     = 7
    FORMAT                    = "I7"
    DESCRIPTION               = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                  = COLUMN

  OBJECT                      = COLUMN
    NAME                      = "COLUMN 110"
    COLUMN_NUMBER             = 111
    UNIT                      = "DN"
    DATA_TYPE                 = INTEGER
    START_BYTE                = 771
    BYTES                     = 7
    FORMAT                    = "I7"
    DESCRIPTION               = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                  = COLUMN

  OBJECT                      = COLUMN
    NAME                      = "COLUMN 111"
    COLUMN_NUMBER             = 112
    UNIT                      = "DN"
    DATA_TYPE                 = INTEGER
    START_BYTE                = 778
    BYTES                     = 7
    FORMAT                    = "I7"
    DESCRIPTION               = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                  = COLUMN

  OBJECT                      = COLUMN
    NAME                      = "COLUMN 112"
    COLUMN_NUMBER             = 113
    UNIT                      = "DN"
    DATA_TYPE                 = INTEGER
```

```
    START_BYTE              = 785
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 113"
    COLUMN_NUMBER           = 114
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 792
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 114"
    COLUMN_NUMBER           = 115
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 799
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 115"
    COLUMN_NUMBER           = 116
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 806
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
  NAME                  = "COLUMN 116"
  COLUMN_NUMBER         = 117
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 813
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 117"
  COLUMN_NUMBER         = 118
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 820
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 118"
  COLUMN_NUMBER         = 119
  UNIT                  = "DN"
  DATA_TYPE             = INTEGER
  START_BYTE            = 827
  BYTES                 = 7
  FORMAT                = "I7"
  DESCRIPTION           = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "COLUMN 119"
  COLUMN_NUMBER         = 120
  UNIT                  = "DN"
```

```
    DATA_TYPE               = INTEGER
    START_BYTE              = 834
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 120"
    COLUMN_NUMBER           = 121
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 841
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 121"
    COLUMN_NUMBER           = 122
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 848
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 122"
    COLUMN_NUMBER           = 123
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 855
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
```

```
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "COLUMN 123"
  COLUMN_NUMBER           = 124
  UNIT                    = "DN"
  DATA_TYPE               = INTEGER
  START_BYTE              = 862
  BYTES                   = 7
  FORMAT                  = "I7"
  DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "COLUMN 124"
  COLUMN_NUMBER           = 125
  UNIT                    = "DN"
  DATA_TYPE               = INTEGER
  START_BYTE              = 869
  BYTES                   = 7
  FORMAT                  = "I7"
  DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "COLUMN 125"
  COLUMN_NUMBER           = 126
  UNIT                    = "DN"
  DATA_TYPE               = INTEGER
  START_BYTE              = 876
  BYTES                   = 7
  FORMAT                  = "I7"
  DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "COLUMN 126"
  COLUMN_NUMBER           = 127
```

```
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 883
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "COLUMN 127"
    COLUMN_NUMBER           = 128
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 890
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IMAGER PIXEL READING, 0 TO 4056"
  END_OBJECT                = COLUMN

END_OBJECT                = TABLE

END
```

4.3.14 IMAGE DISPLAY LABEL

```
SAMPLE IMAGE DISPLAY

PDS_VERSION_ID              = PDS3
LABEL_REVISION_NOTE         = "Mon Sep 25 22:31:35 2006 <UTC>, C. See"

RECORD_TYPE                 = UNDEFINED

^PNG_DOCUMENT               = "IMG_DISPLY_0002_000223_5790.PNG"

DATA_SET_ID                 = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                  = "V_00002I_MMX_00:02:23_5790_DIS"
```

```
SOURCE_PRODUCT_ID             = "V_00002I_MMX_00:02:23_5790_DIS"
MISSION_NAME                  = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME          = "HUYGENS PROBE"
INSTRUMENT_HOST_ID            = HP
TARGET_NAME                   = TITAN
MISSION_PHASE_NAME            = DESCENT
INSTRUMENT_ID                 = DISR
INSTRUMENT_NAME               = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE               = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                   = DISR
PRODUCER_INSTITUTION_NAME     = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME            = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                  = EDR
START_TIME                    = 2005-01-14T09:12:44.579
STOP_TIME                     = 2005-01-14T09:12:44.586
SPACECRAFT_CLOCK_START_COUNT  = 143.579    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 143.586    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME         = 2006-09-25T22:31:35 /*UTC*/

FILE_NAME                     = "IMG_DISPLY_0002_000223_5790.PNG"
EXPOSURE_DURATION             = 7.00000 <MILLISECONDS>
SPACECRAFT_ALTITUDE           = 142.77 <KM>
AZIMUTH                       = 157.44 <DEGREES>
HUYGENS:EW_TILT_ANGLE         =   6.57 <DEGREES>
INSTRUMENT_TEMPERATURE        = (258.7, "UNK", "UNK",
                                 "UNK", 266.1, "UNK",
                                 "UNK", "UNK", "UNK",
                                 "UNK", "UNK") /*KELVIN*/
INSTRUMENT_TEMPERATURE_POINT  = ("CCD_T1","REF_T2","IRB_T3",
                                 "IRE_T4","CCDLUG_T5","STRAP_T6",
                                 "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                 "SH_BOX_T10","EA_BOX_T11")
LAMP_STATE                    = 0000
NATIVE_START_TIME             = 143.5790   <SECONDS>
NATIVE_STOP_TIME              = 143.5860   <SECONDS>
DETECTOR_ID                   = "SLI"

DESCRIPTION = "
```

```
Imager display 128 by 256.
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Image\
filename: V_00002I_MMX_00%02%23_5790_Img
dimensions:        2
num_cols:        128
num_rows:        256
date_replayed: Sun Jan 16 17:32:37 2005
ccd_t1:        258.70
detector:         CCD
exp_time:     7.00000 ms
coord_x:         361
coord_y:           0
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
units:            dn
seq_num:           2
m_time:          143.58
cycle_num:         1
type:             22
altitude (km):   142.774
target_az:      152.000
actual_az:      157.436
lamp:         0000
ccd_stat:            0
dcs_stat:            1
ccd_flag:     1110
proc_flag:    100111
null_col2:        79
null_col3:        76
ccd_tgt_pct:      60
ccd_prctile:      97
ccdlug_t5:    266.10
sqrt_min:        286
sqrt_max:       1738
"

OBJECT                      = PNG_DOCUMENT
  DOCUMENT_NAME               = "DISR Huygens Descent Image"
```

```
  PUBLICATION_DATE           = 2006-09-25
  DOCUMENT_TOPIC_TYPE        = "MISSION RESULTS"
  FILES                      = 1
  DOCUMENT_FORMAT            = PNG
  ENCODING_TYPE              = "PNG1.0"
  INTERCHANGE_FORMAT         = BINARY
  SAMPLE_TYPE                = UNSIGNED_INTEGER
  SAMPLE_BITS                = 16
  DESCRIPTION                = "PNG representation of DISR camera image
                                taken during the Titan Descent,
                               SLI - 256 by 512 pixels."
END_OBJECT                 = PNG_DOCUMENT

END
```

4.3.5 IR LABEL

```
SAMPLE IR (4 bins)

PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE          = "Tue Oct 03 00:14:52 2006 <UTC>, C. See"

RECORD_TYPE                  = FIXED_LENGTH
RECORD_BYTES                 = 46
FILE_RECORDS                 = 159

^DATA_TABLE                  = "IR_0005_001155_2621.TAB"
^REGIONS_TABLE               = ("IR_0005_001155_2621.TAB",152)
^READING_TABLE               = ("IR_0005_001155_2621.TAB",154)
^BINS_TABLE                  = ("IR_0005_001155_2621.TAB",156)

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00005R_MMX_00=11=55_2621_IR"
MISSION_NAME                 = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME         = "HUYGENS PROBE"
INSTRUMENT_HOST_ID           = HP
TARGET_NAME                  = TITAN
```

```
MISSION_PHASE_NAME            = DESCENT
INSTRUMENT_ID                 = DISR
INSTRUMENT_NAME               = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE               = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                   = DISR
PRODUCER_INSTITUTION_NAME     = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME            = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                  = EDR
START_TIME                    = 2005-01-14T09:22:16.262
STOP_TIME                     = 2005-01-14T09:22:16.272
SPACECRAFT_CLOCK_START_COUNT  = 715.262    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 715.272    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME         = 2006-10-03T00:14:52 /*UTC*/

FILE_NAME                     = "IR_0005_001155_2621.TAB"
EXPOSURE_DURATION             = "N/A"
SPACECRAFT_ALTITUDE           = 117.66 <KM>
HUYGENS:EW_TILT_ANGLE         = -13.23 <DEGREES>
INSTRUMENT_TEMPERATURE        = ("UNK", "UNK", 272.6,
                                 272.6, "UNK", "UNK",
                                 "UNK", "UNK", "UNK",
                                 "UNK", "UNK")
                                 /* KELVIN */
INSTRUMENT_TEMPERATURE_POINT  = ("CCD_T1","REF_T2","IRB_T3",
                                 "IRE_T4","CCDLUG_T5","STRAP_T6",
                                 "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                 "SH_BOX_T10","EA_BOX_T11")
LAMP_STATE                    = 1110
NATIVE_START_TIME             = 715.2621   <SECONDS>
NATIVE_STOP_TIME              = 715.2721   <SECONDS>
DETECTOR_ID                   = "IR_COMBINED"
COLUMNS                       = 4
ROWS                          = 150

DESCRIPTION = "
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Ir\
filename: V_00005R_MMX_00%11%55_2621_Ir
dimensions:   2
```

```
num_cols: 150
num_rows:    4
date_replayed: Sun Jan 16 17:32:37 2005
set_name: Ir
detector: IR
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
units: dn
seq_num:      5
m_time:    715.26
cycle_num:    5
type:   10
altitude (km):   117.656
lamp: 1110
ir_stat:    0
ir_flags:    1
irb_t3:  272
ire_t4:  272
p_chrg_volt: 12592
ir_col_time (ms):   10.00
num_rots:   1
num_regions:   1
dc_offset_u: 9468
dc_offset_d: 9618
tgt_pct_u:  50
tgt_pct_d:  50
pct_u:   7
pct_d:   7
num_bins:   4
"

OBJECT                      = DATA_TABLE

  INTERCHANGE_FORMAT        = ASCII
  COLUMNS                   = 5
  ROWS                      = 150
  ROW_BYTES                 = 34
  DESCRIPTION               = "AN ARRAY OF IR MEASUREMENTS
```

```
                          150 BY 4 FROM THE IR SPECTROMETER."

  OBJECT                  = COLUMN
    NAME                  = "ROW"
    COLUMN_NUMBER         = 1
    UNIT                  = "N/A"
    DATA_TYPE             = INTEGER
    START_BYTE            = 1
    BYTES                 = 4
    FORMAT                = "I4"
    DESCRIPTION           = "ROW"
  END_OBJECT              = COLUMN

  OBJECT                  = COLUMN
    NAME                  = "DLIS SHUTTER OPEN"
    COLUMN_NUMBER         = 2
    UNIT                  = "DN"
    DATA_TYPE             = INTEGER
    START_BYTE            = 5
    BYTES                 = 7
    FORMAT                = "I7"
    DESCRIPTION           = "IR_COMBINED COUNTS WHILE SHUTTER OPEN"
  END_OBJECT              = COLUMN

  OBJECT                  = COLUMN
    NAME                  = "DLIS SHUTTER CLOSED"
    COLUMN_NUMBER         = 3
    UNIT                  = "DN"
    DATA_TYPE             = INTEGER
    START_BYTE            = 12
    BYTES                 = 7
    FORMAT                = "I7"
    DESCRIPTION           = "IR_COMBINED COUNTS WHILE SHUTTER CLOSED"
  END_OBJECT              = COLUMN

  OBJECT                  = COLUMN
    NAME                  = "ULIS SHUTTER OPEN"
    COLUMN_NUMBER         = 4
```

```
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 19
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IR_COMBINED COUNTS WHILE SHUTTER OPEN"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "ULIS SHUTTER CLOSED"
    COLUMN_NUMBER           = 5
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 26
    BYTES                   = 7
    FORMAT                  = "I7"
    DESCRIPTION             = "IR_COMBINED COUNTS WHILE SHUTTER CLOSED"
  END_OBJECT                = COLUMN

END_OBJECT                = DATA_TABLE

END


OBJECT                    = REGIONS_TABLE

  INTERCHANGE_FORMAT      = ASCII
  ROWS                    = 1
  COLUMNS                 = 5
  ROW_BYTES               = 38
  DESCRIPTION             = "AN ARRAY OF 5 COLS BY THE NUMBER OF
                             REGIONS EACH ROTATION IS DIVIDED INTO"

  OBJECT                    = COLUMN
    NAME                    = "REGION NUMBER"
    COLUMN_NUMBER           = 1
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
```

```
    START_BYTE              = 1
    BYTES                   = 4
    FORMAT                  = "I4"
    DESCRIPTION             = "NUMBER OF THE REGION"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "STARTING AZIMUTH"
    COLUMN_NUMBER           = 2
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
    START_BYTE              = 7
    BYTES                   = 6
    FORMAT                  = "I6"
    DESCRIPTION             = "STARTING AZIMUTH OF REGION"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "ENDING AZIMUTH"
    COLUMN_NUMBER           = 3
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
    START_BYTE              = 15
    BYTES                   = 6
    FORMAT                  = "I6"
    DESCRIPTION             = "ENDING AZIMUTH OF REGION"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "UP BIN INDEX"
    COLUMN_NUMBER           = 4
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
    START_BYTE              = 23
    BYTES                   = 6
    FORMAT                  = "I6"
    DESCRIPTION             = "TELLS PART OF ARRAY IN WHICH THE
                               ULIS SUM IS ACCUMULATED"
```

```
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "DOWN BIN INDEX"
    COLUMN_NUMBER           = 5
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
    START_BYTE              = 31
    BYTES                   = 6
    FORMAT                  = "I6"
    DESCRIPTION             = "TELLS PART OF ARRAY IN WHICH THE
                               DLIS SUM IS ACCUMULATED."
  END_OBJECT                = COLUMN

END_OBJECT                = REGIONS_TABLE


OBJECT                    = READING_TABLE

  INTERCHANGE_FORMAT      = ASCII
  ROWS                    = 1
  COLUMNS                 = 6
  ROW_BYTES               = 46
  DESCRIPTION             = "AN ARRAY OF 6 COLS BY THE NUMBER OF REGIONS
                             EACH ROTATION IS DIVIDED INTO TIMES THE
                             NUMBER OF ROTATIONS USED FOR DATA GATHERING."

  OBJECT                    = COLUMN
    NAME                    = "ROTATION NUMBER"
    COLUMN_NUMBER           = 1
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
    START_BYTE              = 1
    BYTES                   = 3
    FORMAT                  = "I3"
    DESCRIPTION             = "ROTATION NUMBER"
  END_OBJECT                = COLUMN
```

```
OBJECT                  = COLUMN
  NAME                  = "REGION"
  COLUMN_NUMBER         = 2
  UNIT                  = "N/A"
  DATA_TYPE             = INTEGER
  START_BYTE            = 6
  BYTES                 = 3
  FORMAT                = "I3"
  DESCRIPTION           = "REGION OF ROTATION USED"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "MISSION TIME START"
  COLUMN_NUMBER         = 3
  UNIT                  = "N/A"
  DATA_TYPE             = INTEGER
  START_BYTE            = 11
  BYTES                 = 10
  FORMAT                = "I10"
  DESCRIPTION           = "MISSION TIME AT START OF ROTATION IN SEC X 1E4"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "IR DURATION"
  COLUMN_NUMBER         = 4
  UNIT                  = "8.064 MILLISECOND STEPS"
  DATA_TYPE             = INTEGER
  START_BYTE            = 23
  BYTES                 = 6
  FORMAT                = "I6"
  DESCRIPTION           = "COLLECTION TIME IN THIS ROTATION REGION
                           IN UNITS OF 8.064 MILISECOND STEPS"
END_OBJECT              = COLUMN

OBJECT                  = COLUMN
  NAME                  = "IR SHUTTER TIME"
  COLUMN_NUMBER         = 5
  UNIT                  = 8.064 MILISECONDS PERIODS
```

```
    DATA_TYPE               = INTEGER
    START_BYTE              = 31
    BYTES                   = 6
    FORMAT                  = "I6"
    DESCRIPTION             = "TIME THE SHUTTER IS OPEN IN UNITS OF
                               8.064 MILISECOND STEPS (N*SAMPLE TIME)"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "IR SAMPLE TIME"
    COLUMN_NUMBER           = 6
    UNIT                    = 8.064 MILLISECOND STEPS
    DATA_TYPE               = INTEGER
    START_BYTE              = 39
    BYTES                   = 6
    FORMAT                  = "I6"
    DESCRIPTION             = "TIME BETWEEN READS IN UNITS OF 8.064
                               MILISECOND INCREMENTS (I.E. EXPOSURE TIME)"
  END_OBJECT                = COLUMN

END_OBJECT                  = READING_TABLE


OBJECT                      = BINS_TABLE

  INTERCHANGE_FORMAT        = ASCII
  ROWS                      = 4
  COLUMNS                   = 6
  ROW_BYTES                 = 46
  DESCRIPTION               = "AN ARRAY OF 6 COLS BY THE NUMBER
                               OF ROWS OF DATA IN THE DATA ARRAY."

  OBJECT                    = COLUMN
    NAME                    = "BIN NUMBER"
    COLUMN_NUMBER           = 1
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
    START_BYTE              = 1
```

```
    BYTES                   = 4
    FORMAT                  = "I4"
    DESCRIPTION             = "THE NUMBER OF THE BIN "
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "DLIS OR ULIS"
    COLUMN_NUMBER           = 2
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
    START_BYTE              = 7
    BYTES                   = 6
    FORMAT                  = "I6"
    DESCRIPTION             = "IDENTIFIES THE DOWN (0) OR UP (1)
                               LOOKING INSTRUMENT"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "SHUTTER STATE"
    COLUMN_NUMBER           = 3
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
    START_BYTE              = 15
    BYTES                   = 6
    FORMAT                  = "I6"
    DESCRIPTION             = "TELLS IF THE SHUTTER IS OPEN (0) OR
                               CLOSED (1) FOR THIS REGION AND ROTATION"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "SHUTTER OPEN INTEGRATION TIME"
    COLUMN_NUMBER           = 4
    UNIT                    = "SECONDS*10**-4"
    DATA_TYPE               = INTEGER
    START_BYTE              = 23
    BYTES                   = 6
    FORMAT                  = "I6"
    DESCRIPTION             = "INTEGRATION OF SHUTTER OPEN TIME OVER
```

```
                                ALL ROTATIONS FOR THAT BIN"
  END_OBJECT                  = COLUMN

  OBJECT                      = COLUMN
    NAME                      = "NUMBER SAMPLES TAKEN"
    COLUMN_NUMBER             = 5
    UNIT                      = "SECONDS*10**-4"
    DATA_TYPE                 = INTEGER
    START_BYTE                = 31
    BYTES                     = 6
    FORMAT                    = "I6"
    DESCRIPTION               = "TOTAL SAMPLES TAKEN WITH THE SHUTTER
                                OPEN (OR CLOSED) FOR THAT BIN"
  END_OBJECT                  = COLUMN

  OBJECT                      = COLUMN
    NAME                      = "DATA ROW FOR BIN"
    COLUMN_NUMBER             = 6
    UNIT                      = "SECONDS*10**-4"
    DATA_TYPE                 = INTEGER
    START_BYTE                = 39
    BYTES                     = 6
    FORMAT                    = "I6"
    DESCRIPTION               = "ROW OF THE PIXEL ARRAY THAT CORRESPONDS
                                TO BIN"
  END_OBJECT                  = COLUMN

END_OBJECT                  = BINS_TABLE

END


SAMPLE IR 4 DATA PRINTOUT

   0   49041   49032   53054   53040
   1   48914   48905   53020   53006
   2   48407   48401   52289   52278
   3   48565   48560   52745   52734
```

```
   4   48572   48567   52803   52792
   5   48649   48644   52665   52652
   6   48531   48526   52703   52693
   7   48526   48520   52586   52573
   8   48462   48457   52726   52712
   9   47756   47750   52748   52736
  10   48648   48640   52223   52210
  11   48565   48558   52627   52614
  12   48559   48553   52853   52841
  13   48551   48543   52491   52479
  14   48578   48572   52735   52723
to row:   149


   1   13500   22500      11       1

  1    1     7152827    1234      12       1

   1       0       0   42577     528       0
   1       0       1   42577     528       1
  11       1       0   42577     528       2
  11       1       1   42577     528       3
```

4.3.6 LAMP LABEL

SAMPLE LAMP

```
PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE          = "Tue Oct 03 00:15:05 2006 <UTC>, C. See"

RECORD_TYPE                  = STREAM
FILE_RECORDS                 = 18

^TEXT                        = "LAMP_0001_001141_7062.TXT"

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00001L_MMX_00=11=41_7062_LMP"
```

```
MISSION_NAME                  = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME          = "HUYGENS PROBE"
INSTRUMENT_HOST_ID            = HP
TARGET_NAME                   = TITAN
MISSION_PHASE_NAME            = DESCENT
INSTRUMENT_ID                 = DISR
INSTRUMENT_NAME               = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE               = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                   = DISR
PRODUCER_INSTITUTION_NAME     = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME            = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                  = EDR
START_TIME                    = 2005-01-14T09:22:02.706
STOP_TIME                     = 2005-01-14T09:22:02.706
SPACECRAFT_CLOCK_START_COUNT  = 701.706    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 701.706    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME         = 2006-10-03T00:15:05 /*UTC*/

FILE_NAME                     = "LAMP_0001_001141_7062.TXT"
SPACECRAFT_ALTITUDE           = 118.33 <KM>
LAMP_STATE                    = 1110
NATIVE_START_TIME             = 701.7062   <SECONDS>
NATIVE_STOP_TIME              = 701.7062   <SECONDS>

DESCRIPTION = "
A text file with 18 elements describing the DISR calibration and
surface science lamps' performance (voltages and currents).
"

OBJECT                       = TEXT
NOTE                         = "DISR LAMP"
PUBLICATION_DATE             = 2006-10-03
END_OBJECT                   = TEXT

END

SAMPLE LAMP DATA PRINTOUT
```

```
filename_pre: Z:\Log\stream_524a_alt_az_5-8-2006\DB\Lamp\
filename: V_00001L_MMX_00%11%41_7062_Lmp
date_taken: 2005-01-14T09:22:02.706
set_name: Lamp
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
seq_num:      1
m_time:    701.71
altitude (km):   118.329
lamp:       1110
cal1_volt: 4.98492
cal1_curr: 0.11446
cal2_volt: 4.89708
cal2_curr: 0.10990
cal3_volt: 4.91172
cal3_curr: 0.11674
ssl_volt:      0.000000
ssl_curr:      0.000000
```

4.3.7 SOLAR LABEL

```
SAMPLE SOLAR

PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE          = "Tue Oct 03 00:16:33 2006 <UTC>, C. See"

RECORD_TYPE                  = FIXED_LENGTH
RECORD_BYTES                 = 34
FILE_RECORDS                 = 50

^TABLE                       = "SOLAR_0002_000312_9812.TAB"

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00002A_MMX_00=03=12_9812_SLR"
MISSION_NAME                 = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME         = "HUYGENS PROBE"
INSTRUMENT_HOST_ID           = HP
TARGET_NAME                  = TITAN
```

```
MISSION_PHASE_NAME            = DESCENT
INSTRUMENT_ID                 = DISR
INSTRUMENT_NAME               = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE               = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                   = DISR
PRODUCER_INSTITUTION_NAME     = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME            = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                  = EDR
START_TIME                    = 2005-01-14T09:13:33.981
STOP_TIME                     = 2005-01-14T09:13:34.041
SPACECRAFT_CLOCK_START_COUNT  = 192.981    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 193.041    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME         = 2006-10-03T00:16:33 /*UTC*/

FILE_NAME                     = "SOLAR_0002_000312_9812.TAB"
EXPOSURE_DURATION             = 60.0000 <MILLISECONDS>
SPACECRAFT_ALTITUDE           = 140.23 <KM>
AZIMUTH                       =  96.11 <DEGREES>
HUYGENS:EW_TILT_ANGLE         =   5.21 <DEGREES>
INSTRUMENT_TEMPERATURE        = (259.1, "UNK", "UNK",
                                 "UNK", 266.5, "UNK",
                                 "UNK", "UNK", "UNK",
                                 "UNK", "UNK")
                                 /* KELVIN */
INSTRUMENT_TEMPERATURE_POINT  = ("CCD_T1","REF_T2","IRB_T3",
                                 "IRE_T4","CCDLUG_T5","STRAP_T6",
                                 "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                 "SH_BOX_T10","EA_BOX_T11")
LAMP_STATE                    = 0000
NATIVE_START_TIME             = 192.9812   <SECONDS>
NATIVE_STOP_TIME              = 193.0412   <SECONDS>

DESCRIPTION = "
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Solar\
filename: V_00002A_MMX_00%03%12_9812_Slr
dimensions:   2
num_cols:   4
num_rows:   50
```

```
date_replayed: Sun Jan 16 17:32:37 2005
set_name: Solar
ccd_t1:  259.10
detector: CCD
exp_time:    60.00 ms
coord_x2:  36
coord_y2: 203
coord_x3:  28
coord_y3: 203
coord_x4:  19
coord_y4: 203
coord_x:  45
coord_y: 203
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
units: dn
seq_num:      2
m_time:    192.98
cycle_num:    1
type:         14
altitude (km):   140.226
target_az:   174.000
actual_az:    96.113
lamp:        0000
ccd_stat:    0
ccd_flag:    1110
proc_flag:   111001
cols_sent:    4
null_col2:   67.0000
null_col3:   56.0000
targt_pct:   50
ccd_pct:     97
ccdlug_t5:   266.500
"

OBJECT                      = TABLE

  INTERCHANGE_FORMAT        = ASCII
```

```
COLUMNS                 = 5
ROWS                    = 50
ROW_BYTES               = 34
DESCRIPTION             = "A 4 BY 50 ARRAY OF PIXEL VALUES
                           FROM THE SOLAR AUREOLE CAMERA."

OBJECT                    = COLUMN
  NAME                    = "ROW"
  COLUMN_NUMBER           = 1
  UNIT                    = "N/A"
  DATA_TYPE               = INTEGER
  START_BYTE              = 1
  BYTES                   = 4
  FORMAT                  = "I4"
  DESCRIPTION             = "ROW"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "BLUE HORIZONTAL SUMMED"
  COLUMN_NUMBER           = 2
  UNIT                    = "DN"
  DATA_TYPE               = INTEGER
  START_BYTE              = 5
  BYTES                   = 7
  FORMAT                  = "I7"
  DESCRIPTION             = "500 NM, HORIZONTAL POLARIZED, 6 COLUMN SUM"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "BLUE VERTICAL SUMMED"
  COLUMN_NUMBER           = 3
  UNIT                    = "DN"
  DATA_TYPE               = INTEGER
  START_BYTE              = 12
  BYTES                   = 7
  FORMAT                  = "I7"
  DESCRIPTION             = "500 NM, VERTICAL POLARIZED, 6 COLUMN SUM"
END_OBJECT                = COLUMN
```

```
  OBJECT                     = COLUMN
    NAME                     = "RED VERTICAL SUMMED"
    COLUMN_NUMBER            = 4
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 19
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "935 NM, VERTICAL POLARIZED, 6 COLUMN SUM"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "RED HORIZONTAL SUMMED"
    COLUMN_NUMBER            = 5
    UNIT                     = "DN"
    DATA_TYPE                = INTEGER
    START_BYTE               = 26
    BYTES                    = 7
    FORMAT                   = "I7"
    DESCRIPTION              = "935 NM, HORIZONTAL POLARIZED, 6 COLUMN SUM"
  END_OBJECT                 = COLUMN

END_OBJECT                 = TABLE

END


SAMPLE SOLAR 4 DATA PRINTOUT

   0     102     111     160     109
   1      99     109     200     102
   2     157     136     107      86
   3     147     118      97     139
   4     105     107     141     130
   5    1463      90     100     113
   6     120     107      94     127
   7     138      92     110     109
```

```
   8     163      96     167     112
   9     108     122     127     144
  10     100     125     112     151
  11     103      86     108     103
  12     143     116     118     148
  13     105     105      95     118
  14     141     109     106     122
etc, on to row 50
```

4.3.8 STRIP LABEL

SAMPLE STRIP

```
PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE          = "Tue Oct 03 00:16:43 2006 <UTC>, C. See"

RECORD_TYPE                  = FIXED_LENGTH
RECORD_BYTES                 = 22
FILE_RECORDS                 = 254

^TABLE                       = "STRIP_0001_000713_2492.TAB"

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00001P_MMX_00=07=13_2492_STP"
MISSION_NAME                 = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME         = "HUYGENS PROBE"
INSTRUMENT_HOST_ID           = HP
TARGET_NAME                  = TITAN
MISSION_PHASE_NAME           = DESCENT
INSTRUMENT_ID                = DISR
INSTRUMENT_NAME              = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE              = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                  = DISR
PRODUCER_INSTITUTION_NAME    = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME           = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                 = EDR
START_TIME                   = 2005-01-14T09:17:34.249
STOP_TIME                    = 2005-01-14T09:17:34.252
```

```
SPACECRAFT_CLOCK_START_COUNT  = 433.249    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 433.252    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME         = 2006-10-03T00:16:43 /*UTC*/

FILE_NAME                     = "STRIP_0001_000713_2492.TAB"
EXPOSURE_DURATION             = 2.50000 <MILLISECONDS>
SPACECRAFT_ALTITUDE           = 129.10 <KM>
AZIMUTH                       = 191.36 <DEGREES>
HUYGENS:EW_TILT_ANGLE         =   6.27 <DEGREES>
INSTRUMENT_TEMPERATURE        = (260.2, "UNK", "UNK",
                                 "UNK", 262.3, "UNK",
                                 "UNK", "UNK", "UNK",
                                 "UNK", "UNK")
                                 /* KELVIN */
INSTRUMENT_TEMPERATURE_POINT  = ("CCD_T1","REF_T2","IRB_T3",
                                 "IRE_T4","CCDLUG_T5","STRAP_T6",
                                 "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                 "SH_BOX_T10","EA_BOX_T11")
LAMP_STATE                    = 0000
NATIVE_START_TIME             = 433.2492   <SECONDS>
NATIVE_STOP_TIME              = 433.2517   <SECONDS>

DESCRIPTION = "
A vertical strip   2 by 254 from the right and left side of the sli imager.
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Strip\
filename: V_00001P_MMX_00%07%13_2492_Stp
dimensions:    2
num_cols:    2
num_rows:    254
date_replayed: Sun Jan 16 17:32:37 2005
set_name: Strip
ccd_t1:  260.20
detector: CCD
exp_time:     2.50 ms
coord_x: 359
coord_y:   1
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
```

```
units: dn
seq_num:      1
m_time:    433.25
cycle_num:    3
type:   12
altitude (km):   129.102
target_az:   315.000
actual_az:   191.363
lamp:        0000
ccd_stat:    0
ccd_flag:    1110
proc_flag:   111001
cols_sent:    2
null_col2:   71
null_col3:   69
targt_pct:   60
ccd_pct:             97
strp_cnt_col:       232
first_col_strp:     240
ccdlug_t5:          262.300
"

OBJECT                      = TABLE

  INTERCHANGE_FORMAT        = ASCII
  COLUMNS                   = 3
  ROWS                      = 254
  ROW_BYTES                 = 22
  DESCRIPTION               = "SUM OF PIXEL VALUES FOR 13 COLUMNS
                               NEAR EACH SIDE OF THE SLI"

  OBJECT                      = COLUMN
    NAME                      = "ROW"
    COLUMN_NUMBER             = 1
    UNIT                      = "N/A"
    DATA_TYPE                 = INTEGER
    START_BYTE                = 1
    BYTES                     = 4
```

```
    FORMAT                  = "I4"
    DESCRIPTION             = "ROW"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "DN"
    COLUMN_NUMBER           = 2
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 5
    BYTES                   = 8
    FORMAT                  = "I8"
    DESCRIPTION             = "SUM OF PIXEL VALUES FOR 13 COLUMNS
                               (COLUMN 6 THRU COLUMN 18) NEAR THE
                               LEFT EDGE OF THE SLI"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "DN"
    COLUMN_NUMBER           = 3
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 13
    BYTES                   = 8
    FORMAT                  = "I8"
    DESCRIPTION             = "SUM OF PIXEL VALUES FOR 13 COLUMNS
                               (COLUMN 109 THRU COLUMN 123) NEAR THE
                               RIGHT EDGE OF THE SLI"
  END_OBJECT                = COLUMN

END_OBJECT                = TABLE

END
```

SAMPLE STRIP DATA PRINTOUT

1	0	0
2	0	0
3	139	138
4	142	139
5	141	143
6	143	143
7	143	142
8	147	145

4.3.09 SUN LABEL

SAMPLE SUN

```
PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE          = "Tue Oct 03 00:16:50 2006 <UTC>, C. See"

RECORD_TYPE                  = FIXED_LENGTH
RECORD_BYTES                 = 47
FILE_RECORDS                 = 1

^TABLE                       = "SUN_0001_000425_0610.TAB"

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00001S_MMX_00=04=25_0610_SUN"
MISSION_NAME                 = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME         = "HUYGENS PROBE"
INSTRUMENT_HOST_ID           = HP
TARGET_NAME                  = TITAN
MISSION_PHASE_NAME           = DESCENT
INSTRUMENT_ID                = DISR
INSTRUMENT_NAME              = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE              = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                  = DISR
PRODUCER_INSTITUTION_NAME    = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME           = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                 = EDR
```

```
START_TIME                    = 2005-01-14T09:14:46.724
STOP_TIME                     = 2005-01-14T00:04:25.724
SPACECRAFT_CLOCK_START_COUNT  = 265.724    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 265.724    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME         = 2006-10-03T00:16:50 /*UTC*/

FILE_NAME                     = "SUN_0001_000425_0610.TAB"
NATIVE_START_TIME             = 265.724 <SECONDS>
NATIVE_STOP_TIME              = 265.724 <SECONDS>


DESCRIPTION = "
THREE TIME PULSES AND AN AMPLITUDE FROM THE SUN SENSOR.
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Sun\
filename: V_00001S_MMX_00%04%25_0610_Sun
dimensions:    1
num_cols:    4
num_rows:      1
date_replayed: Sun Jan 16 17:32:37 2005
set_name: Sun
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
units: dn
seq_num:      1
num_triplets:   1
"

OBJECT                      = TABLE

  INTERCHANGE_FORMAT        = ASCII
  COLUMNS                   = 5
  ROWS                      = 1
  ROW_BYTES                 = 47
    DESCRIPTION             = "THE TIME OF THE THREE SUN SENSOR PULSES
                               AND THE AMPLITUDE FROM THE SUN SENSOR."

  OBJECT                      = COLUMN
    NAME                      = "ROW"
```

```
    COLUMN_NUMBER           = 1
    UNIT                    = "N/A"
    DATA_TYPE               = INTEGER
    START_BYTE              = 1
    BYTES                   = 4
    FORMAT                  = "I4"
    DESCRIPTION             = "ROW NUMBER"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "TIME 1"
    COLUMN_NUMBER           = 2
    UNIT                    = "SECOND*10**-4"
    DATA_TYPE               = INTEGER
    START_BYTE              = 5
    BYTES                   = 11
    FORMAT                  = "I11"
    DESCRIPTION             = "FIRST SUN PULSE TIME"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "TIME 2"
    COLUMN_NUMBER           = 3
    UNIT                    = "SECOND*10**-4"
    DATA_TYPE               = INTEGER
    START_BYTE              = 16
    BYTES                   = 11
    FORMAT                  = "I11"
    DESCRIPTION             = "SECOND SUN PULSE TIME"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "TIME 3"
    COLUMN_NUMBER           = 4
    UNIT                    = "SECOND*10**-4"
    DATA_TYPE               = INTEGER
    START_BYTE              = 27
    BYTES                   = 11
```

```
    FORMAT                  = "I11"
    DESCRIPTION             = "THIRD SUN PULSE TIME"
  END_OBJECT                = COLUMN

  OBJECT                    = COLUMN
    NAME                    = "DN"
    COLUMN_NUMBER           = 5
    UNIT                    = "DN"
    DATA_TYPE               = INTEGER
    START_BYTE              = 38
    BYTES                   = 8
    FORMAT                  = "I8"
    DESCRIPTION             = "AMPLITUDE"
  END_OBJECT                = COLUMN

END_OBJECT                = TABLE

END
```

SAMPLE SUN DATA PRINTOUT

1	6823086	6827181	6831277	1616
2	6954158	6958253	6962349	1617
3	7085230	7089325	7093421	1615

4.3.10 TIME LABEL

SAMPLE TIME

```
PDS_VERSION_ID              = PDS3
LABEL_REVISION_NOTE         = "Tue Oct 03 00:16:51 2006 <UTC>, C. See"

RECORD_TYPE                 = FIXED_LENGTH
RECORD_BYTES                = 26
FILE_RECORDS                = 20

^TABLE                      = "TIME_0001_000142_0000.TAB"
```

```
DATA_SET_ID                   = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                    = "V_00001T_MMX_00=01=42_0000_TME"
MISSION_NAME                  = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME          = "HUYGENS PROBE"
INSTRUMENT_HOST_ID            = HP
TARGET_NAME                   = TITAN
MISSION_PHASE_NAME            = DESCENT
INSTRUMENT_ID                 = DISR
INSTRUMENT_NAME               = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE               = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                   = DISR
PRODUCER_INSTITUTION_NAME     = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME            = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                  = EDR
START_TIME                    = 2005-01-14T09:12:03.000
STOP_TIME                     = 2005-01-14T09:12:41.000
SPACECRAFT_CLOCK_START_COUNT  = 102.000    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 140.000    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME         = 2006-10-03T00:16:51 /*UTC*/

FILE_NAME                     = "TIME_0001_000142_0000.TAB"
NATIVE_START_TIME             = 102.000 <SECONDS>
NATIVE_STOP_TIME              = 140.000 <SECONDS>

DESCRIPTION = "
A   2 by  20 array comparing probe mission time
to disr internal time.
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Time\
filename: V_00001T_MMX_00%01%42_0000_Tme
dimensions: 2
num_cols: 2
num_rows: 20
date_replayed: Sun Jan 16 17:32:37 2005
set_name: Time
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
seq_num:      1
```

```
num_time_pairs:   20
"


OBJECT                  = TABLE

  INTERCHANGE_FORMAT       = ASCII
  COLUMNS                  = 3
  ROWS                     = 20
  ROW_BYTES                = 26
  DESCRIPTION              = "TABLE COMPARING PROBE DDB TIME TO
                              DISR INTERNAL CLOCK TIME."

  OBJECT                     = COLUMN
    NAME                     = "ROW"
    COLUMN_NUMBER            = 1
    UNIT                     = "N/A"
    DATA_TYPE                = INTEGER
    START_BYTE               = 1
    BYTES                    = 4
    FORMAT                   = "I4"
    DESCRIPTION              = "ROW NUMBER "
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "TIME 1"
    COLUMN_NUMBER            = 2
    UNIT                     = "SECOND*10**-4"
    DATA_TYPE                = INTEGER
    START_BYTE               = 5
    BYTES                    = 10
    FORMAT                   = "I10"
    DESCRIPTION              = "HUYGENS PROBE DDB TIME"
  END_OBJECT                 = COLUMN

  OBJECT                     = COLUMN
    NAME                     = "TIME 2"
    COLUMN_NUMBER            = 3
```

```
    UNIT                    = "SECOND*10**-4"
    DATA_TYPE               = INTEGER
    START_BYTE              = 16
    BYTES                   = 10
    FORMAT                  = "I10"
    DESCRIPTION             = "INTERNAL DISR CLOCK TIME"
  END_OBJECT                = COLUMN

END_OBJECT                = TABLE

END


SAMPLE TIME DATA PRINTOUT

   1   3000000   2210392
   2   3020000   2230392
   3   3040000   2250392
   4   3060000   2270392
   5   3080000   2290392
   6   3100000   2310392
   7   3120000   2330392
   8   3140000   2350392
   9   3160000   2370392
  10   3180000   2390392
  11   3200000   2410392
  12   3220000   2430392
  13   3240000   2450393
  14   3260000   2470393
  15   3280000   2490393
  16   3300000   2510393
  17   3320000   2530393
  18   3340000   2550393
  19   3360000   2570393
  20   3380000   2590393

4.3.11 VIOLET LABEL
```

```
SAMPLE VIOLET OUTPUT

PDS_VERSION_ID               = PDS3
LABEL_REVISION_NOTE          = "Tue Oct 03 00:17:10 2006 <UTC>, C. See"

RECORD_TYPE                  = FIXED_LENGTH
RECORD_BYTES                 = 11
FILE_RECORDS                 = 1

^TABLE                       = "VIOLET_0001_000224_2528.TAB"

DATA_SET_ID                  = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                   = "V_00001V_MMX_00=02=24_2528_VLT"
MISSION_NAME                 = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME         = "HUYGENS PROBE"
INSTRUMENT_HOST_ID           = HP
TARGET_NAME                  = TITAN
MISSION_PHASE_NAME           = DESCENT
INSTRUMENT_ID                = DISR
INSTRUMENT_NAME              = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE              = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                  = DISR
PRODUCER_INSTITUTION_NAME    = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME           = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                 = EDR
START_TIME                   = 2005-01-14T09:12:45.253
STOP_TIME                    = 2005-01-14T09:12:45.253
SPACECRAFT_CLOCK_START_COUNT = 144.253    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT  = 144.253    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME        = 2006-10-03T00:17:10 /*UTC*/

FILE_NAME                    = "VIOLET_0001_000224_2528.TAB"
SPACECRAFT_ALTITUDE          = 142.74 <KM>
AZIMUTH                      = 177.41 <DEGREES>
HUYGENS:EW_TILT_ANGLE        =   4.95 <DEGREES>
INSTRUMENT_TEMPERATURE       = ("UNK", "UNK", "UNK",
                                "UNK", "UNK" , "UNK",
                                "UNK", 269.5, "UNK",
```

```
                                "UNK", "UNK")
                                /* KELVIN */
INSTRUMENT_TEMPERATURE_POINT  = ("CCD_T1","REF_T2","IRB_T3",
                                "IRE_T4","CCDLUG_T5","STRAP_T6",
                                "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                "SH_BOX_T10","EA_BOX_T11")
LAMP_STATE                    = 0000
NATIVE_START_TIME             = 144.2528   <SECONDS>
NATIVE_STOP_TIME              = 144.2528   <SECONDS>
DETECTOR_ID                   = "DLV"

DESCRIPTION = "
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Violet\
filename: V_00001V_MMX_00%02%24_2528_Vlt
date_replayed: Sun Jan 16 17:32:37 2005
set_name: Violet
detector: DLV
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
units: dn
seq_num:      1
m_time:    144.25
cycle_num:    1
type:    6
altitude (km):   142.743
target_az:   180.000
actual_az:   177.409
lamp: 0000
violet_t8:  269.5
A single measurement from the violet photometer.
"


OBJECT                        = TABLE
  INTERCHANGE_FORMAT          = ASCII
  ROWS                        = 1
  COLUMNS                     = 1
  ROW_BYTES                   = 11
```

```
  DESCRIPTION               = "A SINGLE MEASUREMENT FROM THE VIOLET PHOTOMETER"

  OBJECT                      = COLUMN
    NAME                      = "DN"
    COLUMN_NUMBER             = 1
    UNIT                      = "N/A"
    DATA_TYPE                 = INTEGER
    START_BYTE                = 1
    BYTES                     = 11
    DESCRIPTION               = "A SINGLE READING FROM THE DLV PHOTOMETER"
  END_OBJECT                  = COLUMN
END_OBJECT                  = TABLE

END

SAMPLE VIOLET DATA PRINTOUT

       44

4.3.12 VISIBLE LABEL

SAMPLE VISIBLE

PDS_VERSION_ID              = PDS3
LABEL_REVISION_NOTE         = "Tue Oct 03 00:17:50 2006 <UTC>, C. See"

RECORD_TYPE                 = FIXED_LENGTH
RECORD_BYTES                = 22
FILE_RECORDS                = 200

^TABLE                      = "VISIBLE_0003_000228_9236.TAB"

DATA_SET_ID                 = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                  = "V_00003B_MMX_00=02=28_9236_VIS"
MISSION_NAME                = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME        = "HUYGENS PROBE"
INSTRUMENT_HOST_ID          = HP
TARGET_NAME                 = TITAN
```

```
MISSION_PHASE_NAME            = DESCENT
INSTRUMENT_ID                 = DISR
INSTRUMENT_NAME               = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE               = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                   = DISR
PRODUCER_INSTITUTION_NAME     = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME            = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                  = EDR
START_TIME                    = 2005-01-14T09:12:49.924
STOP_TIME                     = 2005-01-14T09:12:50.061
SPACECRAFT_CLOCK_START_COUNT  = 148.924    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 149.061    /* DDB time in seconds.fff */

PRODUCT_CREATION_TIME         = 2006-10-03T00:17:50 /*UTC*/
FILE_NAME                     = "VISIBLE_0003_000228_9236.TAB"
EXPOSURE_DURATION             = 137.000 <MILLISECONDS>
SPACECRAFT_ALTITUDE           = 142.52 <KM>
AZIMUTH                       = 314.92 <DEGREES>
HUYGENS:EW_TILT_ANGLE         =   0.91 <DEGREES>
INSTRUMENT_TEMPERATURE        = (258.7, "UNK", "UNK",
                                 "UNK", 266.1, "UNK",
                                 "UNK", "UNK", "UNK",
                                 "UNK", "UNK")
                                 /* KELVIN */
INSTRUMENT_TEMPERATURE_POINT  = ("CCD_T1","REF_T2","IRB_T3",
                                 "IRE_T4","CCDLUG_T5","STRAP_T6",
                                 "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                 "SH_BOX_T10","EA_BOX_T11")
LAMP_STATE                    = 0000
NATIVE_START_TIME             = 148.9236   <SECONDS>
NATIVE_STOP_TIME              = 149.0606   <SECONDS>
DETECTOR_ID                   = "ULVS"


DESCRIPTION = "
Upward Looking Visible Spectrometer 2 by 200 summed
filename_pre: Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Visible\
filename: V_00003B_MMX_00%02%28_9236_Vis
```

```
dimensions:    2
num_cols:    2
num_rows:    200
date_replayed: Sun Jan 16 17:32:37 2005
ccd_t1:  258.70
detector: CCD
exp_time:     137.00 ms
coord_x:  45
coord_y:   1
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
units: dn
seq_num:      3
m_time:    148.92
cycle_num:    1
type:   17
altitude (km):   142.524
target_az:     5.000
actual_az:   314.924
lamp:      0000
ccd_stat:    0
ccd_flag: 1110
proc_flag: 111001
 bad_pixels:        replaced
 summing:           summed
 S/W Compression:   compressed
 Square Root Proc:  not square rooted
 H/W Compression:   not compressed
 Exposure Control:  automatic
cols_sent:    2
null_col2:  66
null_col3:  55
H_CCD_TGT_PRC       target %age for CCD  25.000000
H_CCD_PRCTILE       %ile point for CCD   97.000000
ccdlug_t5: 266.1
"

OBJECT                     = TABLE
```

```
INTERCHANGE_FORMAT       = ASCII
COLUMNS                  = 3
ROWS                     = 200
ROW_BYTES                = 22
  DESCRIPTION            = "ULVS DATA SUMMED INTO TWO COLUMNS"

OBJECT                     = COLUMN
  NAME                     = "ROW"
  COLUMN_NUMBER            = 1
  UNIT                     = "N/A"
  DATA_TYPE                = INTEGER
  START_BYTE               = 1
  BYTES                    = 4
  FORMAT                   = "I4"
  DESCRIPTION              = "ROW NUMBER"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
  NAME                     = "LEFT ULVS DATA"
  COLUMN_NUMBER            = 2
  UNIT                     = "DN"
  DATA_TYPE                = INTEGER
  START_BYTE               = 5
  BYTES                    = 8
  FORMAT                   = "I8"
  DESCRIPTION              = "SUM OF COLS 38 TO 41"
END_OBJECT                 = COLUMN

OBJECT                     = COLUMN
  NAME                     = "RIGHT ULVS DATA"
  COLUMN_NUMBER            = 3
  UNIT                     = "DN"
  DATA_TYPE                = INTEGER
  START_BYTE               = 13
  BYTES                    = 8
  FORMAT                   = "I8"
  DESCRIPTION              = "SUM OF COLS 42 TO 45"
```

```
  END_OBJECT                 = COLUMN

END_OBJECT                 = TABLE

END

SAMPLE VISIBLE 2 DATA PRINTOUT

   1      55      53
   2      49      55
   3      53      46
   4      58      49
   5     125      45
   6      44      75
   7      55      49
   8      54      48
   9      48      48
  10      50      50
to row:   199
```

4.3.13 VISIBLE_EX LABEL

```
SAMPLE VISIBLE_EXT

PDS_VERSION_ID             = PDS3
LABEL_REVISION_NOTE        = "Tue Oct 03 00:19:39 2006 <UTC>, C. See"

RECORD_TYPE                = FIXED_LENGTH
RECORD_BYTES               = 22
FILE_RECORDS               = 200

^TABLE                     = "VISIBLE_EX_0001_000223_0117.TAB"

DATA_SET_ID                = "HP-SSA-DISR-2/3-EDR/RDR-V1.0"
PRODUCT_ID                 = "V_00001O_MMX_00=02=23_0117_VEX"
MISSION_NAME               = "CASSINI-HUYGENS"
INSTRUMENT_HOST_NAME       = "HUYGENS PROBE"
INSTRUMENT_HOST_ID         = HP
```

```
TARGET_NAME                   = TITAN
MISSION_PHASE_NAME            = DESCENT
INSTRUMENT_ID                 = DISR
INSTRUMENT_NAME               = "DESCENT IMAGER SPECTRAL RADIOMETER"
INSTRUMENT_TYPE               = {"IMAGER","RADIOMETER","SPECTROMETER"}
PRODUCER_ID                   = DISR
PRODUCER_INSTITUTION_NAME     = "UNIVERSITY OF ARIZONA"
PRODUCER_FULL_NAME            = "DR. ELISABETH MCFARLANE"
PRODUCT_TYPE                  = EDR
START_TIME                    = 2005-01-14T09:12:44.012
STOP_TIME                     = 2005-01-14T09:12:44.310
SPACECRAFT_CLOCK_START_COUNT  = 143.012    /* DDB time in seconds.fff */
SPACECRAFT_CLOCK_STOP_COUNT   = 143.310    /* DDB time in seconds.fff */
PRODUCT_CREATION_TIME         = 2006-10-03T00:19:39 /*UTC*/

FILE_NAME                     = "VISIBLE_EX_0001_000223_0117.TAB"
EXPOSURE_DURATION             = 298.500 <MILLISECONDS>
SPACECRAFT_ALTITUDE           = 142.79 <KM>
AZIMUTH                       = 140.59 <DEGREES>
HUYGENS:EW_TILT_ANGLE         =   7.87 <DEGREES>
INSTRUMENT_TEMPERATURE        = (258.6, "UNK", "UNK",
                                 "UNK", 266.1, "UNK",
                                 "UNK", "UNK", "UNK",
                                 "UNK", "UNK")
                                 /* KELVIN */
INSTRUMENT_TEMPERATURE_POINT  = ("CCD_T1","REF_T2","IRB_T3",
                                 "IRE_T4","CCDLUG_T5","STRAP_T6",
                                 "OPTICS_T7","VIOLET_T8","SH_AUX_T9",
                                 "SH_BOX_T10","EA_BOX_T11")
LAMP_STATE                    = 0000
NATIVE_START_TIME             = 143.0117   <SECONDS>
NATIVE_STOP_TIME              = 143.3102   <SECONDS>
DETECTOR_ID                   = "DLVS_EXT"

DESCRIPTION = "
Reference measurements of scattered light used with the visible data.
This measures instrument crosstalk using otherwise unused columns
between the ulvs and dlvs, and dlvs and imagers,always 2 by 200.
```

```
filename_pre:
Y:\14Jan05\Log\stream_524a_alt_az_5-8-2006_new_alts\DB\Visible_Ext\
filename: V_00001O_MMX_00%02%23_0117_Vex
dimensions:           2
num_cols:     2
num_rows:     200
date_replayed: Sun Jan 16 17:32:37 2005
ccd_t1:     258.60
detector: CCD
exp_time:    298.50 ms
coord_x2:   36
coord_y2:    1
coord_x:     9
coord_y:     1
gse_ver: Release 6.5
test_log: /descent/14Jan05/Log/stream_524
units: dn
seq_num:        1
m_time:       143.01
cycle_num:    1
type:        30
altitude (km):   142.794
target_az:   152.000
actual_az:   140.591
lamp: 0000
ccd_stat:     0
ccd_flag: 1110
proc_flag: 001000
cols_sent:    2
null_col2:  66
null_col3:  55
"

OBJECT                      = TABLE

  INTERCHANGE_FORMAT        = ASCII
  COLUMNS                   = 3
```

```
ROWS                    = 200
ROW_BYTES               = 22
DESCRIPTION             = "CCD READINGS ON EACH SIDE OF THE
                           DLVS COLUMNS"

OBJECT                    = COLUMN
  NAME                    = "ROW"
  COLUMN_NUMBER           = 1
  UNIT                    = "N/A"
  DATA_TYPE               = INTEGER
  START_BYTE              = 1
  BYTES                   = 4
  FORMAT                  = "I4"
  DESCRIPTION             = "ROW"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "COLUMN1"
  COLUMN_NUMBER           = 2
  UNIT                    = "DN"
  DATA_TYPE               = INTEGER
  START_BYTE              = 5
  BYTES                   = 8
  FORMAT                  = "I8"
  DESCRIPTION             = "CCD READINGS IN COLUMN 39"
END_OBJECT                = COLUMN

OBJECT                    = COLUMN
  NAME                    = "COLUMN2"
  COLUMN_NUMBER           = 3
  UNIT                    = "DN"
  DATA_TYPE               = INTEGER
  START_BYTE              = 13
  BYTES                   = 8
  FORMAT                  = "I8"
  DESCRIPTION             = "CCD READINGS IN COLUMN 49"
END_OBJECT                = COLUMN
```

```
END_OBJECT                  = TABLE

END

SAMPLE VISIBLE_EX DATA PRINTOUT

   1      11      13
   2      14      24
   3      11      15
   4      15      11
   5      12      13
   6      12      10
   7      12      10
   8      18      11
   9      71      10
to row:   200
```