

230-TP-002-003

# Interface Control Document Between the ECS and the Product Distribution System Information Server (PDSIS)

Technical Paper

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## RESPONSIBLE AUTHOR

Joan H. Schessler /s/	4/12/01
<hr/>	
Joan H. Schessler, Senior Systems Engineer EOSDIS Core System Project	Date

## RESPONSIBLE OFFICE

Valecia Maclin /s/	4/13/01
<hr/>	
Valecia Maclin, Manager, Systems Engineering Department EOSDIS Core System Project	Date

Raytheon Company  
Upper Marlboro, Maryland

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# Abstract

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Beginning with Release 5BX, physical media distribution of ECS products is done through the EDC Product Distribution System (PDS). ECS interfaces with the PDS via the Product Distribution System Information Server (PDSIS). This technical paper describes the operations concept for this implementation and specifies the relevant interfaces between the ECS and the EDC PDSIS.

**Keywords:** Command Line, Product Distribution, DORRAN, PDS, Interface, Physical Media, SCLI, V0 Gateway

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## Abstract

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## **Abbreviations and Acronyms**

# 1. Introduction

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## 1.1 Purpose

This technical paper is being published to ensure that the operations concept and interface specification for the integration of the EDC Product Distribution System (PDS) into the ECS are permanently documented and that the documentation is accessible to whomever may need it.

## 1.2 Status

This technical paper was originally published to document the initial implementation of the described capabilities in ECS Release 5BX and is updated as necessary to support further changes.

## 1.3 Organization

This paper is organized as follows:

- Introduction
- Operations Concept
- Science Data Server Command Line Interface
- ECS Database Interfaces
- Distribution Notice and Packing List
- Interface Requirements
- Abbreviations and Acronyms

Questions regarding technical information contained within this Paper should be addressed to the following ECS contact:

- Joan H. Schessler, Senior Systems Engineer, 301.925.0426,  
jschessl@eos.east.hitc.com

Questions concerning distribution or control of this document should be addressed to:

Data Management Office  
The ECS Project Office  
Raytheon Systems Company  
1616 McCormick Drive  
Upper Marlboro, MD 20774-5301

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## 2. Operations Concept

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### 2.1 Overview

When the ECS-V0 Gateway receives an order, it separates 8mm tape, DLT, DVD-ROM and CD-ROM delivery requests from other delivery requests. All order requests are entered in the ECS order tracking database. Deliveries of 8mm tape, DLT, DVD-ROM and CD-ROM are handled by the PDS (EDC Product Distribution System) through an interface with the PDSIS (Product Distribution System Information Server) in accordance with this specification. Other requests are forwarded to the ECS Science Data Server.

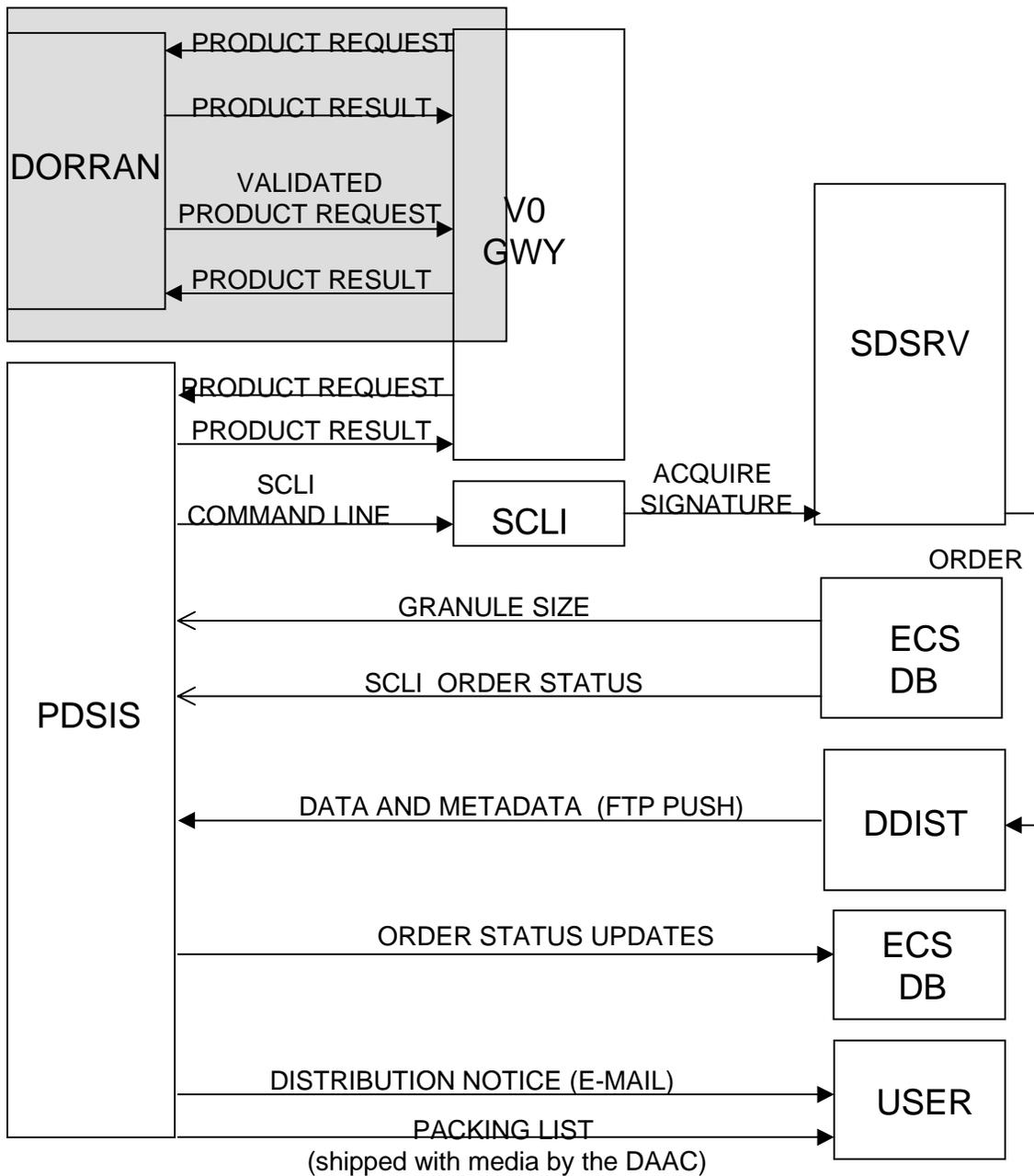
Figure 2-1 diagrams the data flows for the interface. The figure is limited to the physical media orders that are the subject of this specification, namely 8mm tape, DLT, DVD-ROM and CD-ROM. This specification uses the term "physical media" to mean these four delivery types.

If a physical media order is for other than Landsat-7 products (unshaded areas in the figure), the gateway forwards the order to the PDSIS. The interface is socket based and uses the same ODL message formats as the ECS-DORRAN interface. For Landsat-7 products, the V0 Gateway first forwards physical media orders to the DORRAN at EDC (see shaded area of figure); then when the Gateway receives a validated Product Request from DORRAN, it forwards the Landsat order to the PDS. The V0 Gateway-DORRAN interface messages are documented in the ICD Between ECS and the EDC DAAC, ESDIS document number 423-41-58.

For each order it receives from the V0 Gateway, the PDSIS orders the requested data from the ECS using the SCLI, a command line interface with the ECS Science Data Server. The PDSIS may break up large orders into smaller sets and may elect to order granules for a request individually. Orders from the PDSIS do not include Request IDs and are not tracked in the ECS Order Tracking Database. ECS delivers the data to the PDSIS using its standard ftp push data distribution capability. It should be noted that granule level access control is not in effect for orders from the PDSIS, which is viewed as a privileged user.

The PDS fills the order and delivers it. The PDSIS sends an e-mail data distribution notice (order shipment notification) to the user. It then updates the ECS order tracking database to completed status.

Operators may use the PDS operator interfaces to check on status of physical media requests and control the physical media distribution to users. ECS operator interfaces can be used to obtain status of PDSIS requests for data from ECS.



**Figure 2-1. Summary of Data Flows. Shaded area applies only to requests for Landsat-7 data. ECS creation of order tracking records is not shown.**

## 2.2 Orders for Non-Landsat-7 Products

After creating the ECS MSS order tracking information, the V0 Gateway forwards non-Landsat-7 physical media requests to the PDSIS. The forwarded requests include the original order ID and request ID, UR (geoID portion only; see Section 3.3) of the granules to be ordered, the shipping and contact information, and the media options. Granule and order size are not included. Note that the status of the ECS order and request are NULL at this point.

The PDSIS parses the ODL Product Request Message and inserts the request into the PDS database. It returns a Product Result message to the V0 Gateway. The specifications for these messages are in the ICD Between ECS and EDC, 423-41-58.

When ready to process the order, the PDSIS uses the SCLI Acquire script to order the data from ECS. The PDSIS obtains granule size information from the ECS Science Data Server database to predict volumes of data to be received from the ECS. It paces SCLI requests to prevent its staging area from overflowing while at the same time trying to keep its own distribution system busy.

The SCLI order includes the following information:

- FTP Push parameters, such as host, account, password, and directory.
- A user profile reserved for PDSIS use. ECS operators then can readily identify PDSIS orders.
- An e-mail notification address that is reserved for ECS distribution notices to the PDSIS. ECS Distribution (DDIST) uses that e-mail address for all DN's (Distribution Notices) or Failed DN's it generates for PDS-submitted requests.
- The original RequestID. The RequestID is contained in the USERSTRING in the SCLI. The USERSTRING will appear in all DN / Failed DN that ECS creates for PDSIS requests. It can be used by operations to correlate a DN with the original request, should that prove necessary.
- A unique SCLI request ID (called the tag)

The SCLI does not create or update ECS order and request tracking information in the ECS MSS database.

The USERSTRING (containing the RequestID) is displayed on DDIST operator screens. For PDS requests that are currently being processed by ECS, this permits operators to determine the RequestID of the original user order.

ECS stages the requested data and metadata files via FTP Push to the designated PDSIS staging area. DDIST recognizes PDSIS requests and routes them through the an FTP Push server that is connected to a HiPPI interface if such a connection exists at the DAAC.

After the PDSIS has successfully submitted a SCLI order, it checks the DDIST database for completion status of the SCLI order and retrieves the ftp data from the staging area when it finds a status of Shipped.

The PDS generates a packing list and the media and sends an e-mail distribution notice (order shipment notification) to the user's designated e-mail address as specified in the original ODL order. The media are mailed with the packing list to the user's designated address.

On a regular basis (every 5 minutes, for example) the PDSIS checks the PDS database for order completions and certain status changes that are not yet reflected in the ECS MSS database. The PDSIS obtains the ECS Request ID of these orders from the PDS database and updates the corresponding request in the ECS order tracking database to a matching status. User Services can use the ECS order tracking GUI to check status of physical media orders.

## **2.3 Orders for Landsat-7 Products**

The V0 Gateway separates user requests for Landsat products from other requests and routes them to DORRAN at EDC. DORRAN sends a verified request back to the V0 Gateway. The gateway recognizes that this request is now coming from DORRAN because it contains a valid order ID and request ID. This interface is documented in the ICD Between ECS and EDC, 423-41-58.

In accordance with the scenario for non-Landsat-7 products, if the verified request is not a physical media order, the Gateway submits it to the Science Data Server. Otherwise, the V0 Gateway routes an ODL Product Request to the PDS, which responds to the Gateway with a Product Result.

The PDSIS eventually submits a SCLI Acquire for the requested Landsat data. If the request is for a floating scene, the SCLI includes the subsetting parameters. The PDSIS will not submit a floating scene subsetting request for more than one granule in a single SCLI Acquire.

The Science Data Server performs the subsetting and passes the resulting files to DDIST for FTP Push distribution to the PDSIS as described in the preceding section (2.2).

The DDIST special logic to recognize Landsat requests and send a Distribution Notice (order shipment notification) to DORRAN when Landsat orders have been filled is suppressed for PDS requests. The PDS notifies DORRAN of the completion.

## 3. The Science Data Server Command Line Interface

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### 3.1 Acquire Command

To submit an asynchronous acquire request to the Science Data Server, the PDS uses the command line interface client. The command line must be in the following format:

```
acquire mode -p parameterfile -f file -b subsetparmfile -t tag
```

The Acquire command initiates a product order for the granules listed in the referenced file, using the command line interface client to the SDSRV in a given mode. ECS distributes the data via Ftp push, using the request parameters specified in the parameterfile. The subsetparmfile option is present if the request is for subsetted data. The tag is used to assist operators in monitoring of the request.

All of the following command line options except for -b subsetparmfile are required to accompany the command.

#### 1. **mode**

Specifies the ECS mode for the request. This is a required parameter and must be set to a valid DAAC mode (typically OPS, TS1 or TS2)

#### 2. **-p parameterfile**

This option references a parameter file containing information required for the acquire request. The content of the parameter file is defined in Section 3.2.

#### 3. **-f file**

This option references a granule file containing the list of granule universal references (URs) for the files to be acquired.

#### 4. **-b subsetparmfile**

This option is present only for a floating scene subsetting request. It references a file containing the floating scene subsetting parameters for a single granule.

#### 5. **-t tag**

The tag is a request identifier of up to 20 characters that is used as a request tag to aid in monitoring of the request throughout the ECS. When ECS receives an order it checks whether an order with the same tag already exists and ignores resubmissions.

## Example

```
s4p% acquire TS1 -p acquireparms -f MOD01file -t S4PMOD01072600A
```

This command requests the granules listed in the file MOD01file from the SDSRV in TS1 mode, using the acquire parameters found in the file acquireparms, and tagging the request using the id S4PMOD01072600A.

## 3.2 Parameter File

ECSUSERPROFILE = <\$string>

FTPUSER = <string>

FTPPASSWORD = <string>

FTPHOST = <string>

FTPPUSHDEST = <string>

PRIORITY = HIGH | VHIGH | NORMAL | LOW | XPRESS

DDISTMEDIATYPE = FtpPush

DDISTNOTIFYTYPE = MAIL

NOTIFY = <string>

DDISTMEDIAFMT = FILEFORMAT

USERSTRING = <string>

Where:

ECSUSERPROFILE is a string specifying an ECS user profile id assigned to the PDS. The string must begin with a “\$” to indicate the request has been submitted by a system process.

FTPUSER is a string specifying the login ID for the destination ftp server

FTPPASSWORD is a string specifying the password for the destination ftp server.

FTPHOST is a string specifying the host name of the destination ftp server.

FTPPUSHDEST is a string specifying the destination pathname for the ftp push.

PRIORITY is the priority of the acquire request.

DDISTMEDIATYPE is the distribution media type. This must be set to “FtpPush”.

DDISTNOTIFYTYPE is the type of distribution notification to send. This must be set to “MAIL”.

NOTIFY is the PDS e-mail address to which the e-mail distribution notice is to be sent by ECS.

DDISTMEDIAFMT is the file format to use for the requested files. This must be set to "FILEFORMAT".

USERSTRING contains the original RequestID, from the Product Request message

The following is an example acquire parameter file for a non-Landsat-7 order:

```
ECSUSERPROFILE = $labuser
FTPUSER = labuser
FTPPASSWORD = 5BAug00
FTPHOST = f2dis01
FTPPUSHDEST = /tmp
PRIORITY = NORMAL
DDISTMEDIATYPE = FtpPush
DDISTNOTIFYTYPE = MAIL
NOTIFY = PDSreceiver@eos.hitc.com
DDISTMEDIAFMT = FILEFORMAT
USERSTRING = BN00023
```

Notes:

1. Parameters must appear on separate lines.
2. All parameter key words are case sensitive and must appear as shown above.
3. Parameters can appear in any order in the file.

### 3.3 Granule File

The granule file contains geoID UR's. A maximum of 100 UR's can be included in one file.

The geoID is the last portion of the ECS UR. It begins with the basetype (SC, for example) and includes in succession the ESDT shortname, versionID and databaseID. UR's are case sensitive.

Following are examples of geoID UR's

```
SC:AST_L1BT.001:5850
SC:AST_L1BT.001:6750
SC:AST_L1BT.001:6081
```

### 3.4 Subsetting Parameter File

The format for the subsetting parameter file is as follows:

```
{  
    PolygonLatVector =  
    {  
        Latitude = <string>;  
        .  
        .  
        .  
    }  
    PolygonLonVector =  
    {  
        Longitude = <string>;  
        .  
        .  
        .  
    }  
    BandFilesIncluded =  
    {  
        Band = <string>;  
        .  
        .  
        .  
    }  
}
```

Notes:

1. BandFilesIncluded is mandatory.
2. The possible BandFilesIncluded strings are the following:  
"QA\_BAND1\_PRESENT"  
"QA\_BAND2\_PRESENT"

"QA\_BAND3\_PRESENT"

"QA\_BAND4\_PRESENT"

"QA\_BAND5\_PRESENT"

"QA\_BAND6\_PRESENT\_F1"

"QA\_BAND6\_PRESENT\_F2"

"QA\_BAND7\_PRESENT"

"QA\_BAND8\_PRESENT"

3. If all bands are desired, all must be listed.
4. If a band that is not in the requested granule is specified, the request will not be failed.

The following is an example subsetting parameter file:

```
{
    PolygonLatVector =
    {
        Latitude = 79.6443;
        Latitude = 78.4660;
        Latitude = 74.8875;
        Latitude = 75.7831;
    }
    PolygonLonVector =
    {
        Longitude = 159.2251;
        Longitude = 165.1426;
        Longitude = 151.5611;
        Longitude = 146.1926;
    }
    BandFilesIncluded =
    {
        Band = "QA_BAND1_PRESENT";
        Band = "QA_BAND2_PRESENT";
        Band = "QA_BAND3_PRESENT";
        Band = "QA_BAND4_PRESENT";
        Band = "QA_BAND5_PRESENT";
        Band = "QA_BAND6_PRESENT_F1";
        Band = "QA_BAND6_PRESENT_F2";
        Band = "QA_BAND7_PRESENT";
        Band = "QA_BAND8_PRESENT";
    }
}
```

### **3.5 Return Values**

Upon successful submittal of the acquire request to the SDSRV, a value of 0 is returned. Otherwise, a value of 1 is returned.

### **3.6 Errors**

The acquire interface to the SCLI issues an asynchronous acquire to the SDSRV. Error codes indicate the success or failure of the submittal but not of the resulting distribution request. The SCLI.log file contains messages for both successful and unsuccessful submittals of the acquire command. SCLI.log messages consist of a time stamp and the return value. If the return value is 1 (failure), then the log message includes descriptive text of the error. If the error was found during parsing of a command line option, the option is included in the text.

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## 4. ECS Database Interfaces

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### 4.1 MSS Order Tracking Database

For each Request ID, the PDSIS uses a script to update the MSS Order Tracking Database for the events in Table 4-1. Following is the necessary access information:

MSS database server: x0mssnn\_srvr.[localname].ecs.nasa.gov (Note: the database name contains characters that vary with the DAAC. "Localname" is the component of the database path that identifies the DAAC)

sybase login id: PDS

password: Obtained from the DAAC

database: mss\_acct\_db{\_MODE}

table: EcAcRequest

Column to search on: RequestID

column updated requestStatus

**Table 4-1. Order Tracking Database Updates by PDSIS**

Event	requestStatus Column
The PDSIS has accepted the request and it is queued	Pending
Data is being written to media by PDS.	Transferring
The entire order has been canceled.	Canceled
The request has been successfully completed and shipped by the PDS. Distribution Notice has been sent.	Shipped

## 4.2 Granule Sizes

The PDSIS regularly accesses the ECS Science Data Server Database to obtain granule size information to aid in throttling data flow from the ECS. Following is the necessary access information:

Science Data Server database:	x0acgnn_srvr.[localname].ecs.nasa.gov (Note: the database name contains characters that vary with the DAAC. "Localname" is the component of the database path that identifies the DAAC)
sysbase login id:	PDS
password:	Obtained from the DAAC
database:	EcDsScienceDataServer1{_MODE}
table:	DsMdGranules
column to search on:	dbID (Note: dbID is the last, numeric portion, after ShortName and VersionID, of the geoID that the PDSIS receives in the Product Request message from the ECS V0 Gateway.)
column read:	SizeMBECSDataGranule (Note: This is a floating point number giving the granule size in Megabytes.)

## 4.3 SCLI Order Status

After the PDSIS successfully submits an order through the SCLI, it accesses the STMGT/DDIST database to obtain status of the order and thus determine whether the data files can be obtained from the ftp staging area. It first checks for status in the working database; if no status is found, it then checks the archive database. In each case, it matches the UserString for the order; extracts the requestID; then obtains the State for that RequestID. Following is the access information.

STMGT/DDIST database server:	x0acgnn_srvr.[localname].ecs.nasa.gov (Note: the database name contains characters that vary with the DAAC. "Localname" is the component of the database path that identifies the DAAC.)
sybase login id:	PDS
password:	Obtained from the DAAC
database:	stmgtdb1{_MODE}

## **Working Database**

table: DsDdParameterList  
Column to search on: UserString  
Column to compare: RequestId

table: DsDdRequest  
Column to compare: RequestId  
Column read: State

## **Archive Table**

table: DsDdParameterListArchive  
Column to search on: UserString  
Column to compare: RequestId

table: DsDdRequestArchive  
Column to compare: RequestId  
Column read: State

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## 5. Distribution Notice and Packing List

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For each physical media shipment, the PDSIS sends an e-mail distribution notice to the customer as soon as the shipment is made. The same notice is produced as a hard copy packing list and included in each shipment.

The standard distribution notice for physical media distributions by the PDSIS, defined in Table 5-1, differs from the standard distribution notice sent for ECS ftp distributions and documented in the ICDs for various ECS external interfaces. Figure 5-1 is an example distribution notice.

The customer address information is included on the distribution notice.

There are no "Failed" distribution notices. Rather, the final status of each granule is reported as Complete or Canceled.

A separate directory is dedicated to each unit (granule) on the media. The directory is named by the Unit ID for that granule. The physical media distribution notice points to the correct directory for each granule. The PDSIS uses the granule file names obtained in the distributions received from ECS, which thus follow standard ECS naming conventions.

The Packing List that is included in each order is simply a printed copy of the distribution notice content with addition of a NASA logo.

**Table 5-1. Physical Media Distribution Notice Content (1 of 3)**

Item	Description	Format/Size	Example
Preamble	Free text explanation customized by the DAAC.	Variable length text file Note: delimiter characters are part of the customized text.	(See Figure 5-1.)
Completion Date	Date Distribution Notice was generated	Fixed String (36B) MM/DD/YYYY <blank>HH:MM:SS	Completion<space>Date:<space>12/21/2000 12:18:22
Shipping Address	Information from the SHIPPING_ADDRESS group in ODL Product_Request received from V0 Gateway	Variable Strings Shipping Address: <First_Name><space><Middle_Initial><space><Last-Name> <Title> <Organization> <Address> <City>,<space><State> <space><Zip> <Country>	(See Figure 5-1)

**Table 5-1. Physical Media Distribution Notice Content (2 of 3)**

Item	Description	Format/Size	Example
Phone	Information from the SHIPPING_ADDRESS group in ODL Product Request received from V0 Gateway	Fixed String (19B) Phone:<space><phone>	Phone:<space>555-555-5555
Fax	Information from the SHIPPING_ADDRESS group in ODL Product Request received from V0 Gateway	Fixed String (17B) Fax:<space><fax>	Fax:<space>555-555-5555
e-Mail	Information from the SHIPPING_ADDRESS group in ODL Product Request received from V0 Gateway	Variable String (8B plus variable e-mail address) e-Mail:<space><e-mail>	e-Mail:<space>jkirk@starfleet.com
PDS Order Number	Order tracking number from PDS database	Fixed String (31B)  nnnYYMMDDmmmm where "nnn" is the Order Node from the PDS database, the date is the order date from the ODL Product Request and "mmmm" is system generated by PDS.	PDS<space>Order<space>Number:<space>0011224010001
OrderID/RequestID	ECS Customer Order number and Request ID as assigned by ECS in ECS Order Tracking Database	Fixed String (40B, including 10 for OrderID, 1 colon and 10 for RequestID)	OrderID/RequestID:<space>0000009055:0000012914
Unit Number	ID assigned to a granule by the PDS and also used as the name of the directory containing that granule on the media	Fixed String (5B) The Unit Number restarts at 00001 for each RequestID	00002
Unit Status	Processing status of the granule: either Complete or Canceled	Fixed String (8B)	Canceled
Dataset	ECS granule ID as furnished in the ODL Product Request message from the V0 Gateway to PDSIS (geID)	Variable String (32B max)	SC:AST_L1BT.001:6081

**Table 5-1. Physical Media Distribution Notice Content (3 of 3)**

<b>Item</b>	<b>Description</b>	<b>Format/Size</b>	<b>Example</b>
Media_type	8 MM, CD-ROM, DLT, DVD	Variable String (6B max)	CD-ROM
Media_ID	Composite of PDS Order Number, Unit Number and Media Volume	Variable String (25B) <PDS Order Number>_<Unit Number>_<Volume Number>	0011224010001_00002_2

\*\*\*\*\*

Thank you for using the Earth Observing System Distribution System.

For more information on your request contact the DAAC.

\*\*\*\*\*

PDS Order Number: 0011224010022

OrderID/RequestID: 0000009055:0000012914

Completion Date: 12/21/2000 12:18:22

Shipping Address:

James T. Kirk  
Captain  
Star Fleet  
123 ABC St  
Washington, DC 22222  
USA

Phone: 555-555-5555

Fax: 555-555-5555

E-Mail: jkirk@starfleet.com

Unit No. / Media Directory	Unit Status	Dataset	Media_Type	Media_ID
00001	Complete	SC:AST_L1BT.0 01:5850	CD-ROM	0011224010022_ 00001_1
00001	Complete	SC:AST_L1BT.0 01:5850	CD-ROM	0011224010022_ 00001_2
00002	Complete	SC:AST_L1BT.0 01:6750	CD-ROM	0011224010022_ 00002_1

**Figure 5-1. Example Physical Media Distribution Notice**

# Appendix A. Interface Requirements

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## A.1 ECS Requirements

- PDS-0010 The ECS shall send Product Request messages to the PDSIS in the format specified in the ICD Between ECS and the EDC DAAC, 423-41-58.
- PDS-0020 The ECS shall receive Product Result messages from the PDSIS in the format specified in the ICD Between ECS and the EDC DAAC, 423-41-58.
- PDS-0024 The ECS shall receive PDSIS granule size queries to the Science Data Server Database.
- PDS-0030 The ECS shall receive data orders from the PDSIS through the Science Data Server Command Line Interface defined in this specification.
- PDS-0040 The ECS shall send e-mail notices of ftp data distributions to the PDSIS using the format for order shipment notification specified in the ICD Between ECS and the EDC DAAC, 423-41-58.
- PDS-0050 The ECS shall make ftp deliveries of ordered data and metadata to the PDSIS.
- PDS-0060 The ECS shall route ftp deliveries to the PDSIS through HiPPI at DAACs where that connection is available.
- PDS-0070 The ECS shall receive order tracking database updates for status of physical media orders from the PDSIS.

## A.2 PDS Requirements

- PDS-0110 The PDSIS shall receive Product Request messages from ECS in the format specified in the ICD Between ECS and the EDC DAAC, 423-41-58.
- PDS-0120 The PDSIS shall send Product Result messages to ECS in the format specified in the ICD Between ECS and the EDC DAAC, 423-41-58.
- PDS-0124 The PDSIS shall obtain granule sizes from the ECS Science Data Server
- PDS-0130 The PDSIS shall submit data orders to the ECS using the Science Data Server Command Line Interface defined in this specification.
- PDS-0140 The PDSIS shall receive e-mail notices of ftp data distributions from the ECS.
- PDS-0142 The PDSIS shall obtain status of its SCLI orders for ftp data distributions from the DDIST databases.

- PDS-0150 The PDSIS shall receive ftp deliveries of data and metadata it has ordered from the ECS.
- PDS-0160 The PDSIS shall update the ECS order tracking database with the following status codes: Pending, Transferring, Canceled, Aborted, Shipped
- PDS-0170 The PDSIS shall send an e-mail notice of data distribution to the user for each physical media delivery it ships using the format for order shipment notification specified in the ICD Between ECS and the EDC DAAC, 423-41-58.
- PDS-0230 The PDSIS shall include a packing list in each physical media shipment to the user.
- PDS-0240 The PDSIS shall include in the packing list the same information that is on the order shipment notification specified in the ICD Between ECS and the EDC DAAC, 423-41-58.

# Abbreviations and Acronyms

---

DAAC	Distributed Active Archive Center
DDIST	Data Distribution
DN	Distribution Notice
DORRAN	Distributed Ordering, Research, Reporting and Accounting Network
ECS	EOSDIS Core System
EDC	EROS Data Center
EDG	EOS Data Gateway
EOSDIS	Earth Observing System Data and Information System
EROS	Earth Resources Observation System
HiPPI	High Performance Parallel Interface
LGID	Local Granule ID
ODL	Object Description Language
PDS	(EDC) Product Distribution System
SCLI	Science data server Command Line Interface
UR	Universal Reference
V0	Version 0

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