

# User's Guide

## Earth Observing System (EOS) Data and Information System (EOSDIS) Test System (ETS) Operations Management Data Simulator (OMDSIM)

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# 1 – Introduction

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## 1.1 Purpose and Scope

This document provides guidance for using the Earth Observing System (EOS) Data and Information System (EOSDIS) Test System (ETS) Operations Management Data Simulator (OMDSIM).

## 1.2 Document Organization

This user's guide comprises three sections. Section 1 gives an introduction to the document and its conventions. Section 2 gives an overview of OMDSIM, and Section 3 describes in detail how to use OMDSIM.

## 1.3 Assumptions and Conventions

This user's guide assumes that you have a basic familiarity with graphical user interfaces (GUIs) such as OSF/Motif, Macintosh, or Microsoft Windows.

This user's guide assumes that a standard mouse will be used as the pointing device for controlling the interaction via the OMDSIM GUI. The information in this user's guide applies to any pointing device (e.g., track ball, arrow keypad) that will work with a UNIX workstation in an equivalent way.

The rest of this section explains the conventions that this user's guide uses to explain OMDSIM operation, and those that the OMDSIM user interface itself uses.

### 1.3.1 User's Guide Conventions

To indicate and represent certain kinds of OMDSIM user interface objects in the text, this user's guide uses the following conventions:

- Text that you should enter appears in the *Courier* typeface, with quotation marks around it. (Do not type the quotation marks.)
- *Pull-down menu options* appear in italic.
- **Pushbutton, radio button, and check button names** appear in boldface type.
- “Click on” a GUI object means position the pointer (usually an arrow) over that object, and press and release the left mouse button, without moving the mouse.

### 1.3.2 Overall Style

OMDSIM user interface objects that are standard OSF/Motif objects have the look and feel as described in the *OSF/Motif Style Guide* (MSG), version 1.2. This section describes some of these specifics.

OMDSIM includes some other kinds of user interface objects that are not described in MSG. These have the look and feel of analogous objects in Microsoft (MS) Windows 3.1.1. An example is a list field — a combination of an editable text field, a down-arrow pushbutton, and a popup list. (The list field resembles Windows' combination box — e.g., the MS Word font selector is a combination box.)

### 1.3.3 General Conventions

The title of a window or dialog box identifies the user task that the window or dialog box supports, and it may also identify the primary action and specific focus of that user task.

An ellipsis (“...”) at the end of a menu option name or pushbutton label indicates that additional information is needed for completion of the action that the option or pushbutton invokes. A dialog box will appear to collect that information.

A highlighted border surrounding an object (e.g., a text field or pushbutton) indicates that the object has keyboard focus, and that any key(s) you press will apply to that object. For example, if a pushbutton has keyboard focus, pressing the “Enter” key will activate that pushbutton. For another example, if a text field has keyboard focus, anything you type will go into that field (except that the “Enter” key has the behavior described above).

Any object that may be accessible or “clickable” under some conditions is “grayed out” or “dim” under conditions in which it is not accessible.

### 1.3.4 Dialog Boxes

#### 1.3.4.1 Primary dialog boxes

Some OMDSIM dialog boxes are controlled by the use of three pushbuttons:

- **OK** accepts all input and changes, and closes the dialog box. Any actions you have specified in the dialog are executed.
- **Cancel** closes the dialog box without accepting any input or changes (unless you have **Applied** or **Set** them; see Section 1.3.4.2). **Cancel** does not execute the task or any actions that you may have specified in the dialog.
- **Help** initiates the display of information about how to use the task dialog box (and any relevant subordinate dialog boxes).

The File Selection dialog box (Figure 1-3) is an example of a primary dialog box.

#### 1.3.4.2 Multiple modification dialog boxes

Some dialog boxes allow for modifications of many of the same type of item. Where it is practical, all items are displayed at the same time for editing. If there are too many items or if they contain too much information to be displayed in a simple way (e.g., several of the panels in the OMD Editor, Section 3.3.4), only one item is displayed at a time. These sections have a **Next** button and a **Prev** (“Previous”) button to enable you to work on different items of the same type. To display the next item in the list, click on **Next**. To display the previous item in the list, click on **Prev**.

The dialog boxes with **Next** and **Previous** buttons also have **Set** and **Reset** buttons for making your changes to an individual item. To save the values for later use, click on **Set**. To restore the parameters that were previously saved for that item, click on **Reset**.

#### 1.3.4.3 Confirmation dialog boxes

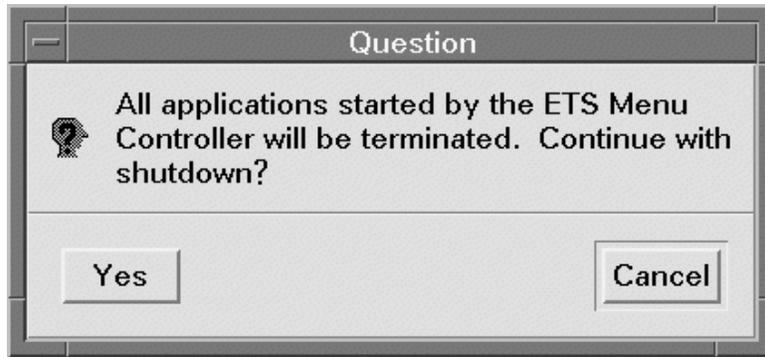
Some user actions must be confirmed before they can be executed. For these actions, a Confirmation dialog box (Figure 1-1) appears when you initiate the action.

Confirmation dialog boxes have **Yes** and **No** pushbuttons. To execute the action and close the confirmation dialog box, click on **Yes**. If the action was initiated via a click on the task dialog box’s **OK** pushbutton, the task dialog box is also closed. To close the confirmation dialog box and return to the task dialog box without executing the action, click on **No**.

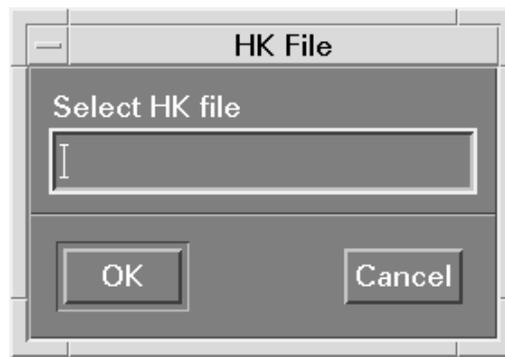
#### 1.3.4.4 Prompt dialog boxes

A prompt dialog box (Figure 1-2) is used to request more information.

Type the requested information into the field provided. To use that information, click on **OK**. To cancel the action and avoid entering the information, click on **Cancel**.



**Figure 1-1. Confirmation Dialog Box (Menu Controller example)**



**Figure 1-2. Prompt Dialog Box (MPS example)**

#### **1.3.4.5 File selection dialog boxes**

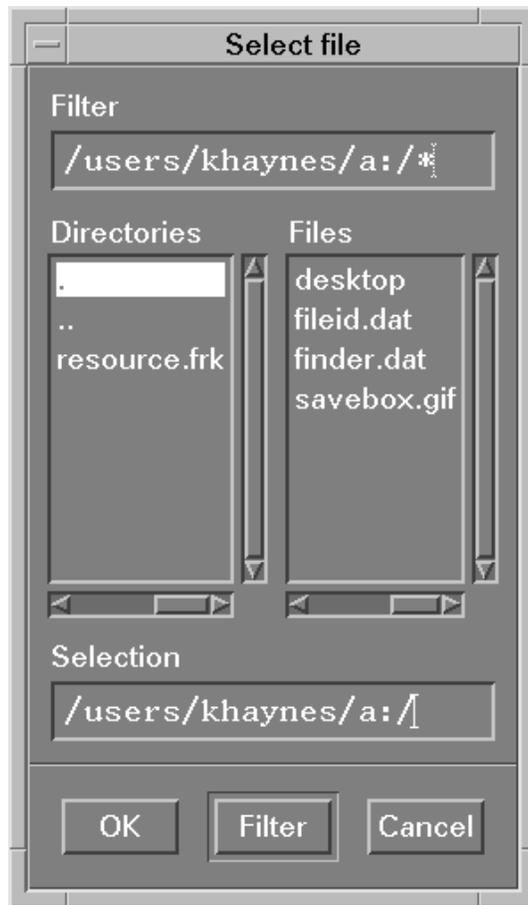
A file selection box (Figure 1-3) is used to select files for opening, saving, printing, and other OMDSIM task activities. Most of the file selection boxes have the name of the activity included in the title.

The File filter (e.g. "/users/khaynes/a:\*") appears in the field labeled "Filter" at the top of the dialog box. (A wildcard "\*" indicates that all files are listed.) The "Directories" section lists the directories below the directory shown in the "Filter" field. (Access to a directory is limited to authorized users of that directory.) The "File" section lists all files in the directory that match the file filter.

To change the filter and list only some of the files in a directory, just edit the "Filter" field and click on the **Filter** pushbutton. The "Directories" and "Files" list boxes change to reflect the new filter.

To see files in a different directory, click on the desired name in the "Directories" section. To see the contents of the directory that is one level above the current directory, click on the "." line. (A single dot ["."] is the UNIX way of indicating the current directory; clicking on it will just redisplay the directory information that you already see.) The "Filter" text field changes to reflect the new directory, and the "Files" section changes to show the files that are in the selected directory. The "Directories" section also changes to show the subdirectories of the selected directory.

To select a file and use it in the OMDSIM task activity, either double-click on the filename or click on the filename (which will then appear in the "Selection" text area) and then click on **OK**. To close the file selection box without selecting a file, click on **Cancel**.

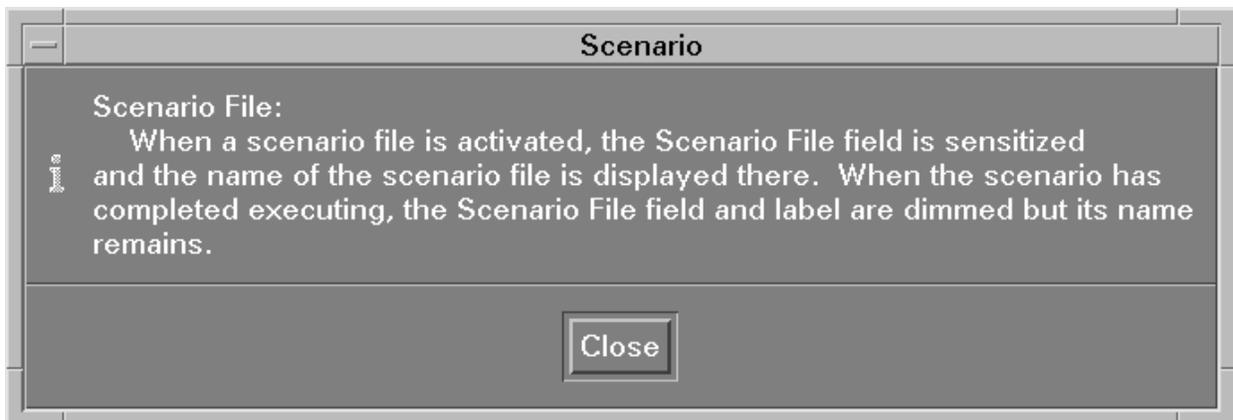


**Figure 1-3. File Selection Dialog Box**

#### 1.3.4.6 Display-only dialog boxes

Some dialog boxes are used for display only, rather than control or data entry. These dialog boxes have only a **Close** button (instead of **OK**, **Apply**, or **Cancel**) because there are no entries, changes, or actions to accept, execute, or cancel.

The information dialog box (Figure 1-4) is an example of a display-only dialog box.



**Figure 1-4. Display-only Dialog Box**

To close a display-only dialog box and continue with the task, click on **Close**.

### 1.3.5 Pull-Down Menus

Every menu title and many menu options have one character underlined. This character is called the “mnemonic” (memory aid) for that menu or menu option. A mnemonic allows access to that menu and menu option via the keyboard.

A right-pointing arrow (▶) at the end of a menu option indicates that a cascade menu (a submenu) will appear for selecting more details under that option.

### 1.3.6 Other Controls

#### 1.3.6.1 Check buttons

A check button represents an individual option that can be either selected or not selected (either “on” or “off”). A check button has a label with a square to the left, which appears raised (Figure 1-5a) when the option is not selected (“off”) and appears darkened and recessed (Figure 1-5b) when the option is selected (“on”).



**Figure 1-5. Check Buttons**

Check buttons may exist individually or in a group, according to their meanings, but they are always independent from one another (i.e., selecting or deselecting one has no effect on any of the others). A check button may appear in a window, dialog box, or pull-down menu. Select a check button by clicking on either the square or the label.

#### 1.3.6.2 Radio buttons

A radio button group represents a set of mutually exclusive options — i.e., only one of the options can be “on” at any one time, and selecting one of the radio buttons in a group automatically deselects the radio button that was selected beforehand. Each radio button has a label with a diamond to the left, which appears darkened and recessed when that particular option is selected. A radio button group may appear in a window, dialog box, or pull-down menu, and (except in a menu) may be aligned horizontally (Figure 1-6a) or vertically (Figure 1-6b). Select a radio button by clicking on either the diamond or the label.



**Figure 1-6. Radio Buttons**

### 1.3.6.3 Text fields

Text fields may be editable or not. Editable text fields (Figure 1-7a) appear recessed, and a text insertion cursor (an “I-beam”) is visible within the field to show where the typed text will appear. Text fields that cannot be edited (Figure 1-7b) do not appear recessed (although they may have a rectangular border), and they do not contain a text insertion cursor.



**a - Editable**



**b - Non-Editable**

**Figure 1-7. Text Field**

### 1.3.6.4 Spinners

A spinner (Figure 1-8 ) allows you the option of setting a value either by typing it into a text field or by clicking on up or down arrow pushbuttons to increase or decrease the value shown in the text field (usually  $\pm 1$  for each click).



**Figure 1-8 Spinner**

### 1.3.6.5 Panel sizing bars

Some windows have multiple panels that can be expanded and condensed via a panel sizing bar (Figure 1-9). A horizontal line marks the separation between one panel and the next. A small square at the right side of the horizontal line is the panel sizing button. To expand or shrink a panel in a paned window, move the mouse pointer over the sizing button, press the mouse button, and drag the sizing button up or down until the panel has the size you want.



**Figure 1-9. Panel Sizing Bar**

To expand the panel above the bar, move the bar down. To expand the panel below the bar, move the bar up. (Note: the bar cannot be moved if the panel is already at its full height.)

### 1.3.6.6 List fields

A list field (Figure 1-10) is a combination of a label, a text field, a list box, and a down-arrow pushbutton. You may type a value into the text field or select an item from the list.



**Figure 1-10. List Field**

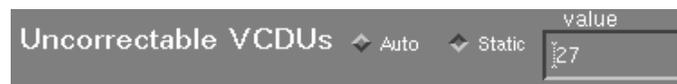
To activate the list, click on the down-arrow pushbutton. A list box showing the valid entries will appear below the field, and the pushbutton will change to an up arrow. To select one of the items, click on that item; to remove the list without changing the selected item, click on the up-arrow pushbutton.

### 1.3.6.7 Auto/static fields

OMDSIM uses Auto/Static fields for setting the values of count parameters. The RLPC, FLSB, and CCSDS VCDU panels include settings for a substantial number of count parameters. For each count parameter, you can specify that it be incremented automatically or remain constant for each successive transmission from the same CODA Report template. To make the count increment automatically, select the **Auto** radio button, and enter the increment and the period (in seconds) between applications of that increment to the present value of the counter. To make the count constant, select the **Static** radio button and enter its value.



**Figure 1-11. Auto/Static Field (set to “Auto”)**



**Figure 1-12. Auto/Static Field (set to “Static”)**

# 2 – Operations Management Data Simulator (OMDSIM) Introduction

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## 2.1 Functional Summary

The ETS Operations Management Data (OMD) Simulator (OMDSIM) is a software application that provides a source of OMD messages to supplement the capabilities of ETS-simulated mission data generation and reception. In particular, OMDSIM supports Customer Operations Data Accounting (CODA) reports, Spacecraft Contact Session (SCS) reports, PDS/EDS Delivery Records, and PDS/EDS Acceptance Notifications. OMDSIM runs on all three ETS hardware platforms: MPS, LRS, and HRS.

Although OMDSIM is capable of operating without support from MPS, LRS, or HRS, it is designed to communicate with the software of those ETS subsystems. Rather than requiring you to direct OMDSIM to start and stop OMD transmission, OMDSIM is designed to receive such directives from the other ETS subsystems. In this way, the transmission of CODA and SCS reports are synchronized with MPS/LRS/HRS processing and transmission of real-time and rate-buffered telemetry data, which are being sent to the EOC.

In addition, OMDSIM

- Keeps a log file of OMDSIM events
- Keeps a log file of OMD transmitted and received
- Displays OMD transmission and reception events
- Displays OMDSIM status and anomalous occurrences
- Maintains, displays, and logs OMD accounting statistics
- Responds to received OMD (acknowledges receipt of EDS or PDS delivery record OMD)
- Accepts OMD from other EOSDIS test elements and logs their receipt

## 2.2 Operational Summary

Operation of OMDSIM involves four types of activities (listed here and described in later sections):

- Establish the values of the data fields that constitute the working OMD template
- Indicate a transmission schedule (the interval between transmissions and the duration of the schedule) for the prepared OMD template
- Generate the signals to begin and terminate the testing phase of operations
- Delog the OMD transmitted and received

In the pretest phase of OMDSIM operation, you prepare OMD templates and establish transmission schedules for upcoming test sessions. OMDSIM uses the data and information you provide in the OMD template via the OMD Editor panels and combines them with values either generated by OMDSIM itself or from quality and accounting information supplied directly by the hardware, as in the case of the LRS and the MPS. The resulting OMD, based on the template directives and updating fields, is transmitted to other EOSDIS elements through EBnet during a testing session.

OMDSIM places very few restrictions (other than data type) on the information you can place into the OMD templates. For instance, a CODA has no consistency checks to ensure that the VCIDs used are

valid for EOS-AM1. This allows you to enter erroneous values to assess the error handling capabilities of the entity that is receiving the OMD.

Considerable data are associated with the various OMD simulated by OMDSIM, especially CODA and SCS reports. In the case of the LRS, most of the information contained in the OMD is directly supplied or derived from the quality and accounting indicators provided by the LRS hardware as it processes actual data received from an external source. Alternatively, you can control the setting of values in the created and transmitted OMD by establishing an initial value and time-varying relationship for each field in OMD templates using the OMD Editor panels. This is especially useful for setting counters to increment over time. This scripting feature is used when OMDSIM is used in a standalone mode or when the hardware does not provide the specific data contents (e.g., on the MPS platform). In the case of the LRS, hardware-provided values will override any value you might enter into the OMD template.

A nominal transmission schedule is associated with the EOSDIS OMD; some are transmitted on a regular basis and others are triggered by a predecessor event. For example, CODA are typically transmitted by EDOS to the EOC every five seconds while real-time telemetry is active; an SCS report is sent by EDOS to the EOC within five minutes of the completion of rate-buffered services; PDS/EDS delivery records are sent by EDOS to a DAAC within one minute of sending a data set; and a PDS/EDS acceptance notification is sent by a DAAC to EDOS after the data set and delivery record are received (15 to 45 minutes, depending on data set size). You can specify the frequency and duration of OMD transmission via the OMDSIM Main Window (see section tbd) or through the use of scenario files (see sections tbd and tbd). You may also use a scenario file to create OMD using more than OMD template in succession, each for a specified duration. This enables you to change the contents or timing of the resulting OMD in a predetermined fashion. If you choose to schedule OMD transmission by providing information only once, you will have no opportunity to change the underlying OMD template while the test is in progress.

During an OMDSIM test phase, OMD are transmitted and (possibly) received, depending on the test configuration. OMD transmission is controlled by an internal schedule, either specified by you or tied to internal signals associated with mission data. You can signal the one-time transmission of a selected OMD or specify the start and stop times of a transmission from the main window. Alternatively, OMD transmission can be coordinated with internally generated signals, triggering the synchronized starting and stopping of transmitted mission data or announcing the reception of a data set. For the LRS, the MPS, and the HRS, OMDSIM receives a start signal when any real telemetry format is first activated and receives a stop signal when telemetry is terminated. In this way, CODA are sent out as long as telemetry is active, and when telemetry stops the summary SCS report is transmitted. For the HRS, signals are generated for OMDSIM when a PDS/EDS is ready for delivery, which triggers a delivery record to be sent, or when a PDS/EDS is received, which triggers a PDS/EDS acceptance notification to be sent. It is important to note that the activities required before transmission can occur — creating and loading OMD templates, establishing the transmission schedule, and (optionally) opening log files — must be completed before the expected start of the test because OMDSIM will not recognize any signals from the hardware until these steps are complete.

During posttest operations, several log files created by OMDSIM are available for your analysis. All OMDSIM events are time-tagged and recorded in an automatically created ASCII text file, which can be printed directly on any attached printer. An OMD logging function is available under the *File* menu in the OMDSIM main window. The delogging function is under the *View* menu of the OMDSIM main window, and permits you to view or print any portion of the stored OMD log after logging is complete.

When OMDSIM is operating with MPS, LRS, or HRS, scenario files can be loaded and executed, and OMD of type CODA can be loaded and transmitted on a predetermined schedule. (You can modify the parameters for the OMD via the OMD Editor.) Both scenario execution tests and OMD transmission tests are controlled by signals from the simulator (MPS, LRS, or HRS) and by the transmission interval, test duration, and SCS Summary delay fields. In addition, scenario execution

tests are controlled by the **Start/Stop Scenario** pushbutton, and OMD transmission tests are controlled by the **Start/Stop Transmission** pushbutton.

## 2.3 Definitions

Throughout this section, the definitions outlined below have been adopted.

Counter — a type of OMD template message item, such as the number of CADUs received in a CODA

Loading a scenario — the process of selecting a scenario file and preparing it to regulate OMD transmission

Loading an OMD — the process of selecting an OMD template file and preparing it for OMD transmission

OMD file — a file containing OMD template information

OMD template — the definition of the OMD elements and of the associated information for the counter elements

OMD transmission — the activity that is started when you click on the **Start Transmission** pushbutton. An OMD template file is loaded and OMD are transmitted according to the transmission interval and duration defined in the OMD Transmission panel of the OMDSIM main window. OMD transmission ends when you click on the **Stop Transmission** button or OMDSIM receives a stop signal from MPS, LRS, or HRS.

Scenario execution — the activity that is started when you click on the **Start Scenario** pushbutton. A scenario file is loaded and is executed according to its directives. Scenario execution ends when you click on the **Stop Scenario** button or the end of the scenario file is reached

Scenario file — a file whose records contain transmission interval, transmission duration, and OMD filename

Summary delay — the number of seconds after the last OMD is transmitted or the scenario/transmission is stopped (by you or by a signal from MPS, LRS, or HRS)

Test duration — the length of time that the current OMD is repeatedly updated and transmitted. The test duration may be set to any positive integer value of time in units of minutes, but the duration 0 has a special meaning; transmit only one OMD. The longest test duration is limited (by the operating system) to be  $2^{31}-1$  (2,147,483,647) minutes.

Transmission interval — the number of seconds between successive transmission of OMD using the current OMD template

## 2.4 Setup

### 2.4.1 Hardware Configuration

On the MPS, OMDSIM executes on the MVME-187 single-board computer with a PC display executing the eXceed X Window System emulator software. On the LRS and HRS, OMDSIM executes on a Hewlett-Packard workstation running the X Window System.

### 2.4.2 Software Configuration

The OMDSIM software comprises a user interface software component and other(s), which communicate to enable you to initiate and control OMDSIM's functions. However, this software structure does not affect how the OMDSIM is used, and this document does not discuss it further.

### 2.4.3 Files and Environment Variables

OMDSIM depends on a number of predefined files and environment variables.

The OMDSIM scenario file contains records with a minimum of three fields that are separated by any standard "C" language delimiters (one or more blanks, one or more tabs, one or more line feeds, etc). The fields are, in order:

- Time interval in seconds between CODA transmissions (an integer value)
- Duration in minutes of the transmission (an integer value)
- Fully qualified name of the OMD template file to be used for this duration

OMDSIM requires an OMD template for any transmitted OMD. The template file provides the default values to be used in the transmitted OMD for fields that are to remain constant, and it supplies controlling information about the optional fields of OMD. For LRS and HRS, the hardware supplies the contents of the OMD fields. For MPS, the contents of all OMD fields are simulated rather than hardware-supplied, so the OMD template can also be used to script ramping functions for various counters and data quality fields in a CODA or SCS OMD transmission scenario. You create the OMD template using the OMD Editor, which you invoke from the *Setup* menu in the OMDSIM main window. See sections tbd for information on creating an OMD template, defining OMD contents, and loading an OMD template.

OMDSIM uses the contents of the OMD template only as a source of data values for transmitted OMD. These contents do not control any aspect of the actual OMD transmission. For example, specifying the destination field in the ground message header of a CODA template will not cause the OMD to be sent to that destination, because that function is controlled by the environment variables OMD\_TRANSMIT\_TOHOSTNAME and OMD\_TRANSMIT\_PORTNAME. This gives you the flexibility to inject errors into the OMD.

OMDSIM generates a session log file, which is created when OMDSIM starts. Its name is <timestamp>.omd\_log, where <timestamp> is the start time of OMDSIM. Every entry that appears in the status log area of the OMDSIM main window is stamped with its time of occurrence and is entered into the session log.

OMDSIM can also create a log of all OMD received and transmitted (see sections tbd and tbd). These log files are created in the directory designated by the ETS\_PROC\_LOG\_DIR environment variable. The files may be delogged at the completion of a test using the OMD delogger (see section tbd).

Table 2-1 shows the OMDSIM environment variables and their expected values.

### 2.4.4 Starting OMDSIM

To start OMDSIM, use the predefined command provided by the system administrator to bring up the ETS Menu Controller, and click on the **OMDSIM** pushbutton in the Menu Controller (see section tbd for details about the Menu Controller).

Alternatively, you can enter "omdsim" at the UNIX command line prompt. The Menu Controller, however, is the recommended method. It is simpler because it sets up the execution environment automatically and does not require any intervention from you.

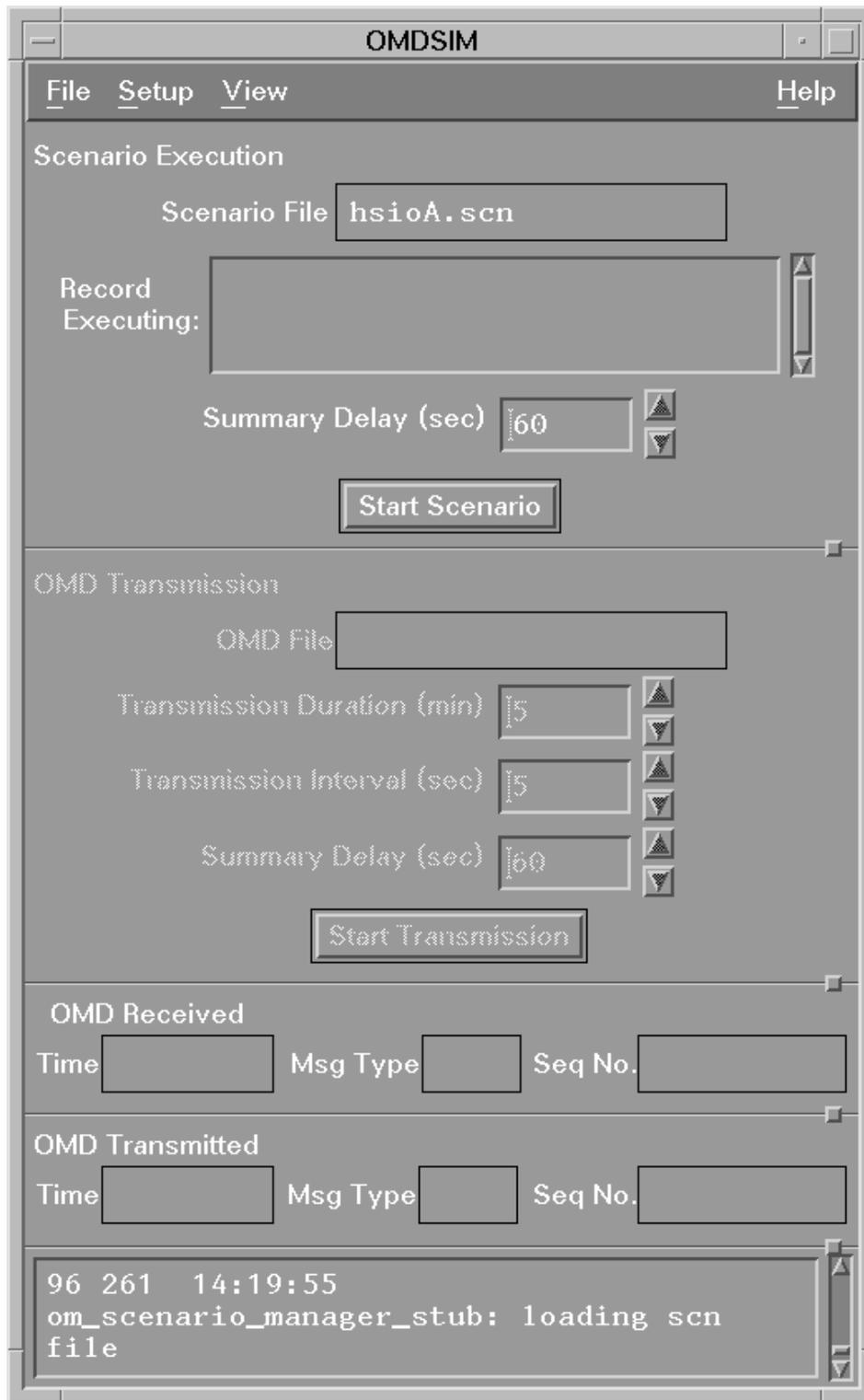
<u>MPS Environment Variable</u>	<u>Expected Value</u>
<u>Menu controller variables</u>	
ETS_ICON_FILE	\$ETS_RUN_ROOT/runtime/mmc_sample_icon_file
ETS_TEMP_DIR	\$ETS_RUN_ROOT/runtime/temp
<u>ETS execution variables</u>	
ETS_HELP_DIR	\$ETS_RUN_ROOT/runtime/help
ETS_LOG_DIR	\$ETS_RUN_ROOT/runtime/log
ETS_OMD_DIR	\$ETS_RUN_ROOT/runtime/omd
ETS_PARAMS_DIR	\$ETS_RUN_ROOT/runtime/params
ETS_PROC_LOG_DIR	\$ETS_RUN_ROOT/runtime/log
ETS_SCN_DIR	\$ETS_RUN_ROOT/runtime/scenario
ETS_SUBSYSTEM	"MPS" or "LRS" or "HRS" (uppercase text string, without quotes)
<u>OMDSIM variables</u>	
OM_DELOG	\$ETS_RUN_ROOT/om_delog
OM_RECEIVER	\$ETS/RUN/ROOT/om_receiver task
OM_RECEIVER_SUB	\$ETS/RUN/ROOT/om_receiver_sub
OM_SCENARIO_MANAGER	\$ETS/RUN/ROOT/om_scenario_manager
OM_SCHEDULER	\$ETS/RUN/ROOT/om_scheduler
OM_TRANSMISSION_TASK	\$ETS/RUN/ROOT/om_transmission_task
OMD_RECEIVER_PORTNAME	port number of socket on which incoming OMD may received from other EOSDIS test elements
OMD_TRANSMIT_PORTNAME	port number on which outgoing OMD of type CODA are to be transmitted via UDP protocol
OMD_TRANSMIT_TOHOSTNAME	host name of destination device, as known to domain name server resident on MPS, LRS, or HRS computer
OMDSIM_HOSTNAME	name of host computer executing the MPS, LRS, or HRS user interface component (i.e., the MVME-187)
OMDSIM_PORTNAME	port number of socket on which MPS, LRS, or HRS user interface communicates with OMDSIM

**Table 2-1. OMDSIM Environment Variables and their Expected Values**

## 2.5 Operational Overview

### 2.5.1 Main Window

When you start OMDSIM, the OMDSIM main window(Figure 2-1), appears. The main window provides access to OMDSIM functions and presents status information and important configuration information. On startup, the contents of the fields in the main window are blank and the



**Figure 2-1. OMDSIM Main Window**

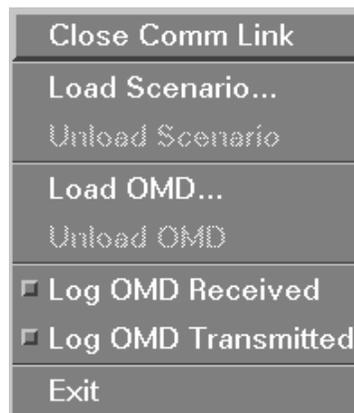
The OMDSIM main window contains five panels:

- **Scenario Execution** provides control and status information about the OMDSIM scenario being executed. This panel is accessible after a scenario file has been loaded.
- **OMD Transmission** provides control for individual OMD transmission. This panel is accessible after an OMD file has been loaded.
- **OMD Received** provides information on the most recent OMD received. This panel is available only when received OMD are being logged to a file.
- **OMD Transmitted** provides information on the most recent OMD transmitted. This panel is available only when transmitted OMD are being logged to a file.
- The **status log** area at the bottom includes process status, command directives, and errors. Every entry in the log is stamped with the time of its occurrence. This panel is always available. (See section 3.1.5 for details.)

See Section 3.1 for details on using the OMDSIM main window and its panels.

### 2.5.2 File Menu

The OMDSIM File menu (Figure 2-2) provides access to disk files and communication links associated with the OMDSIM.



**Figure 2-2. OMDSIM File Menu**

The OMDSIM File menu provides the following functions:

- Open Comm Link** — Enable/initiate communications with EBnet and MPS (required for scenario and OMD loads). (See Section 3.2.1 for details.)
- Close Comm Link** — Close/terminate communications with EBnet/MPS (loading scenarios and OMD no longer possible). (See Section 3.2.2 for details.)
- Load Scenario** — Select a scenario file and prepare it for execution. (See Section 3.2.3 for details.)
- Unload Scenario** — Remove the current scenario file from the execution context. (See Section 3.2.4 for details.)
- Load OMD** — Select an OMD template file and prepare it for execution. (See Section 3.2.5 for details.)
- Unload OMD** — Remove the OMD template file from the execution context. (See Section 3.2.6 for details.)

**Log OMD Received** — Store into a log file a record of all OMD that OMDSIM receives (required for responding to incoming OMD). (See Section 3.2.7 for details.)

**Log OMD Transmitted** — Store into a log file a record of all OMD that OMDSIM transmits. (See Section 3.2.8 for details.)

**Exit** — Shut down the OMD Simulator; close/terminate any open communications links. (See Section 3.2.9 for details.)

### 2.5.2 Setup Menu

The OMDSIM Setup menu (Figure 2-3) provides for setting up a scenario that OMDSIM can execute or an OMD file that it can transmit.



**Figure 2-3. OMDSIM Setup Menu**

The Setup menu provides the following functions:

**Open Scenario** — Create or edit a scenario file. (See Section 3.3.1 for details.)

**New OMD:**

**CODA Report** — Create a new CODA report template file. (See Section 3.3.2.1 for details.)

**PDS Delivery Record** — Create a new PDS delivery record template file. (See Section 3.3.2.2 for details.)

**EDS Delivery Record** — Create a new EDS delivery record template file. (See Section 3.3.2.3 for details.)

**Open OMD** — Select and open an OMD template file. (See Section 3.3.3 for details.)

### 2.5.2 View Menu

The OMDSIM View menu (Figure 2-4) provides for viewing logs of received or transmitted OMD.



**Figure 2-4. OMDSIM View Menu**

### 2.5.2 Help Menu

The OMDSIM Help menu (Figure 2-5) provides help on using the OMDSIM main window.



**Figure 2-5. OMDSIM Help Menu**

The OMDSIM Help menu options provide the following functions:

**About OMDSIM** — Display help about the OMDSIM main window in general.

**On context** — Display help about a specific area of the OMDSIM main window.

## 2.6 Operational Procedures and User Tasks

OMDSIM can generate OMD of various types. When using OMDSIM with MPS or LRS, you will most be generating CODA; when using it with HRS, you will be generating OMD associated with PDS and EDS delivery and receipt. On all of these systems, you initially establish the content of the OMD (except EDS and PDS acknowledgments) by creating templates using the various OMD editors available from the OMDSIM *Setup* menu. These templates contain the information that is constant for the duration of the test and parameters for generating information that is time varying during the test. The templates generally allow you great freedom in selecting the values to be transmitted in the corresponding OMD so that with few exceptions, anomalous conditions that are presently unforeseen may be introduced. You may, for instance, use the template to create CODA that indicate that the spacecraft ID is EOS-PM1, when all other indications and formats in the CODA are valid for EOS-AM1.

OMDSIM fills the contents of CODA and SCS reports very differently, depending on whether it is running on the MPS or on the LRS or HRS. The LRS and HRS are used to process external sources of return- and forward-link data. Thus, the quality and accounting indicators that go into the CODA and SCS OMD message are obtained directly or are derived from data supplied by the hardware. CODA and SCS reports accurately reflect the processed data on the LRS or HRS, and you do not have the option of overriding OMD values provided by the hardware. For the MPS, however, contents of CODA and SCS reports are completely simulated. Therefore, for the MPS you may simulate the values of the counters using information entered into the template. In general, you specify a value as static (constant) for the duration of the template, or as automatic (ramping) to be incremented over a period by an amount you specify. The amount of time to increment a variable can be independent of the CODA transmission time interval.

In broad overview, you direct the course of the OMD transmissions, both in the sense of determining the values that are to be placed in the OMD sent to other EOSDIS elements and in timing the transmissions. Many of the tasks involved are automated or may require information established and saved only once before any specific test.

Assume that a useful OMD template exists and is available for use in a specific test. You have two options to execute the test:

The most straightforward test is the transmission test. A transmission test involves the following steps:

- 1) Establish communication with entities outside OMDSIM: From the *File* menu, select the *Open Comm Link* option.
- 2) Load an OMD template: From the *File* menu, select the *Load OMD* option and specify the OMD file name in the dialog box.
- 3) Set the OMD transmission parameters: In the OMD Transmission panel of the OMDSIM main window, set an interval between subsequent OMD transmission events and set a duration for the test.
- 4) Start OMD transmission: Click on the **Start Transmission** pushbutton or wait for the signal from MPS/LRS/HRS (when telemetry is started).
- 5) End the test: Click on the **Stop Transmission** pushbutton or wait for the stop signal from MPS/LRS/HRS.

The other test method is scenario execution. It provides more flexibility than the transmission test because you can chain together more than one OMD template (serially) to transmit different OMD during the test. You can also transmit more than one OMD template (serially) during the test. Scenario execution involves the following steps:

- 1) Create a scenario file: From the *Setup* menu, select the *Open Scenario* option. (See section 3.1.4.3 for the format of an OMDSIM scenario file.) Ensure that the OMD files you reference in the scenario file actually exist.
- 2) Establish communication with entities outside OMDSIM: From the *File* menu, select the *Open Comm Link* option.
- 3) Load a scenario file: From the *File* menu, select the *Load Scenario* option and specify the scenario file name in the dialog box.
- 4) Set scenario execution parameters: In the Scenario Execution section of the OMDSIM main window, set the delay after the last OMD transmission for the test summary to be transmitted.
- 5) Start scenario execution: Click on the **Start Scenario** pushbutton or wait for the start signal from MPS/LRS/HRS (when telemetry is started).
- 6) End the test: Click on the **Stop Scenario** pushbutton, wait for the stop signal from MPS/LRS/HRS (when telemetry is stopped).

The OMDSIM *File* menu provides the following additional functions:

- *Unload OMD* and *Unload Scenario* allow you to “undo” the OMD or scenario preparation. To load a different OMD or scenario before starting transmission or execution, you must first unload whatever is loaded.
- *Log OMD Received* enables the monitoring and logging of incoming OMD. This option must be enabled if OMDSIM is to respond to incoming OMD.
- *Log OMD Transmitted* option provides a record of OMD transmitted during the session.

## 3 - Using OMDSIM

### 3.1 Main Window

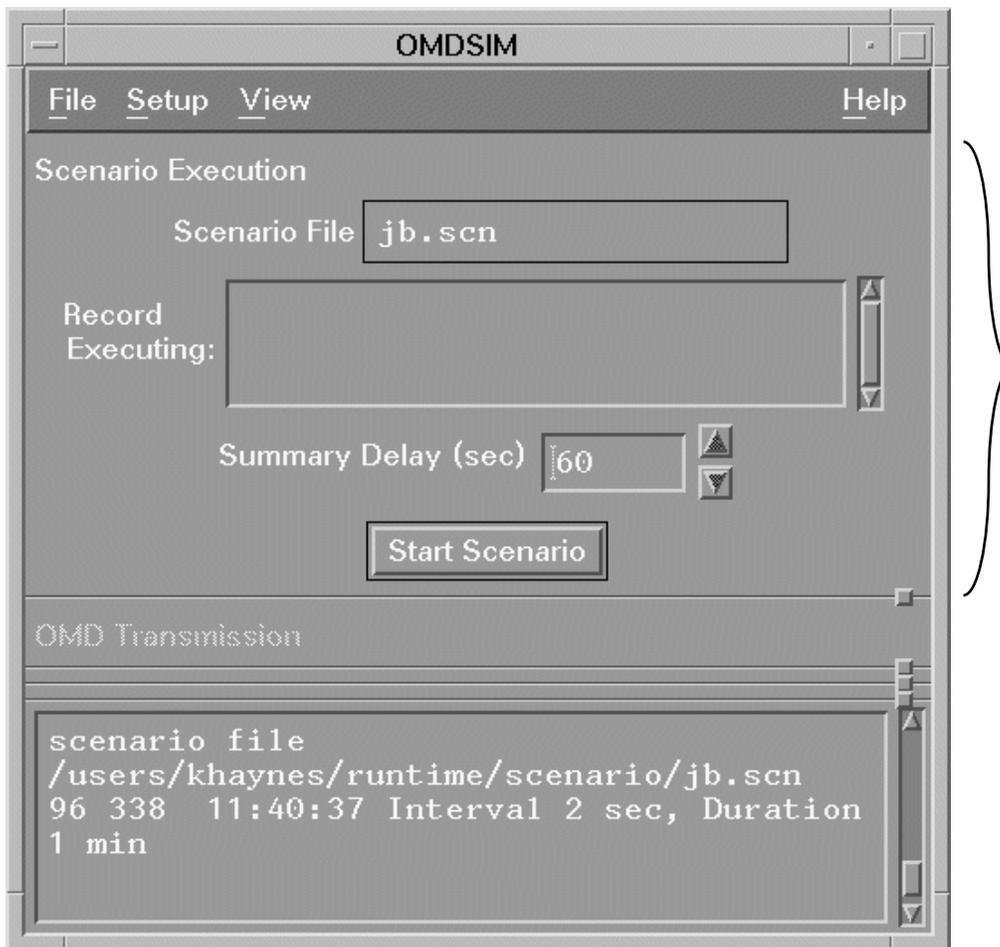
The OMDSIM main window consists of five panels (Figure 2-1). Normally, not all of these are visible simultaneously. This section discusses the panels separately, although more than one of them may be visible. In each of the figures about the panels, a brace (“}”) to the side of the screen picture indicates the specific panel that the section covers.

To show or hide all or part of the Scenario Execution panel or any of the OMD panels in the OMDSIM main window, use the panel sizing bar (see section 1.3.6.5). The status log panel is always visible.

#### 3.1.1 Scenario Execution Panel

The OMDSIM Scenario Execution panel (Figure 3-1) provides the interaction for controlling the execution of scenarios. The Scenario Execution panel is active when a scenario is loaded (see the *Load Scenario* option in the File menu, Section 3.2.3).

The Scenario Execution panel shows the name of the scenario file that is being executed. A scenario may call for a sequence of more than one OMD template to be used to generate OMD in succession,



**Figure 3-1. Scenario Execution Panel (OMDSIM Main Window)**

each with different characteristics, so this panel lists each record in the scenario file as it is executed. (Once an OMD file is specified, subsequent records in the scenario file may contain directives for how the OMD template is to be modified for the following transmission sequences.) Before starting the scenario, you can use the “Summary Delay” spinner” to change the summary delay. The Summary Delay is the interval in seconds between the transmission of the last OMD and the transmission of the SCS via Kerberos FTP (KFTP) to other EOSDIS test elements.

To execute the scenario, click on the **Start Scenario** pushbutton.

While the scenario is executing, the pushbutton has the name **Stop Scenario**. To stop the scenario before it has finished executing, click on **Stop Scenario**.

If you wait for the scenario to play itself out or for OMDSIM to receive a stop signal from MPS (sent by MPS when telemetry generation is stopped), the scenario will end by itself.

Note: If you stop the scenario, either by using the **Stop Scenario** button or by stopping MPS telemetry generation, the test summary will not be transmitted. The test summary is transmitted only when the scenario plays itself out because it is assumed that you will start another scenario again, continuing the transmission of OMD soon after the interruption.

When the scenario ends, the Scenario Execution panel is no longer active, and its fields and controls are dim and unavailable.

If the scenario ended by being stopped before completion, the *Load OMD* and *Load Scenario* options in the File menu are available again immediately. If the scenario ended by playing to completion, the summary delay will determine the number of seconds before those options are available again, because a scenario is not considered fully complete until its test summary has been transmitted.

### 3.1.2 OMD Transmission Panel

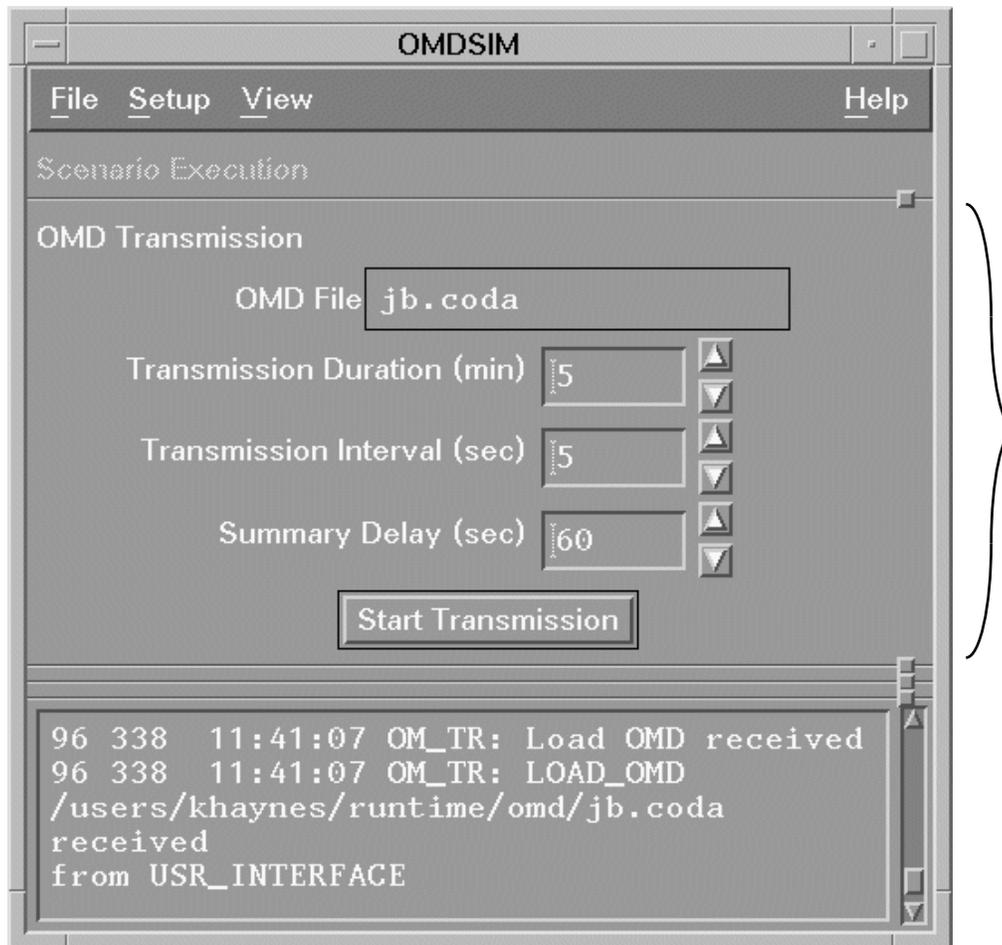
The OMDSIM OMD Transmission panel (Figure 3-2) provides the interaction for controlling the transmission of a single OMD template. The OMD Transmission panel is active when an OMD template file is loaded (see the *Load OMD* option in the File menu, Section 3.2.5).

The OMD Transmission panel shows the name of the OMD template file that is being used to guide OMD transmission and generate OMD counter values. A single type of OMD may be transmitted using the dialog available on this panel, according to the “interval” and “duration” values. (The characteristics of the template cannot be changed from this panel during the course of a test — i.e., after you have clicked on **Start Transmission**.) Before starting OMD transmission, you can use the various spinners to change the transmission duration, transmission interval, or summary delay.

To transmit OMD, click on the **Start Transmission** pushbutton. Alternatively, you can wait for OMDSIM to receive a signal from MPS/LRS/HRS that telemetry generation has been started. (If you click on the **Start Transmission** pushbutton before telemetry generation has begun, the signal from MPS/LRS/HRS will have no effect on OMDSIM.)

While the transmission is proceeding, the pushbutton has the name **Stop Transmission**. To stop the transmission before it has finished, click on **Stop Transmission**. Alternatively, you can wait for OMDSIM to receive a signal from MPS/LRS/HRS that telemetry generation has been stopped. (If you click on the **Stop Transmission** pushbutton before telemetry generation has ended, the signal from MPS/LRS/HRS will have no effect on OMDSIM.)

When the transmission is complete, the OMD Transmission panel is no longer active, and its fields and controls are dim.



**Figure 3-2. OMD Transmission Panel (OMDSIM Main Window)**

### 3.1.3 OMD Received Panel

The OMD Received Panel (Figure 3-3) displays information about OMD that OMDSIM receives. The OMD Received Panel is active only when OMDSIM is logging the OMD it receives (see the *Log OMD Received* option in the File menu, Section 3.2.7).

This panel contains no controls, and is for information display only.

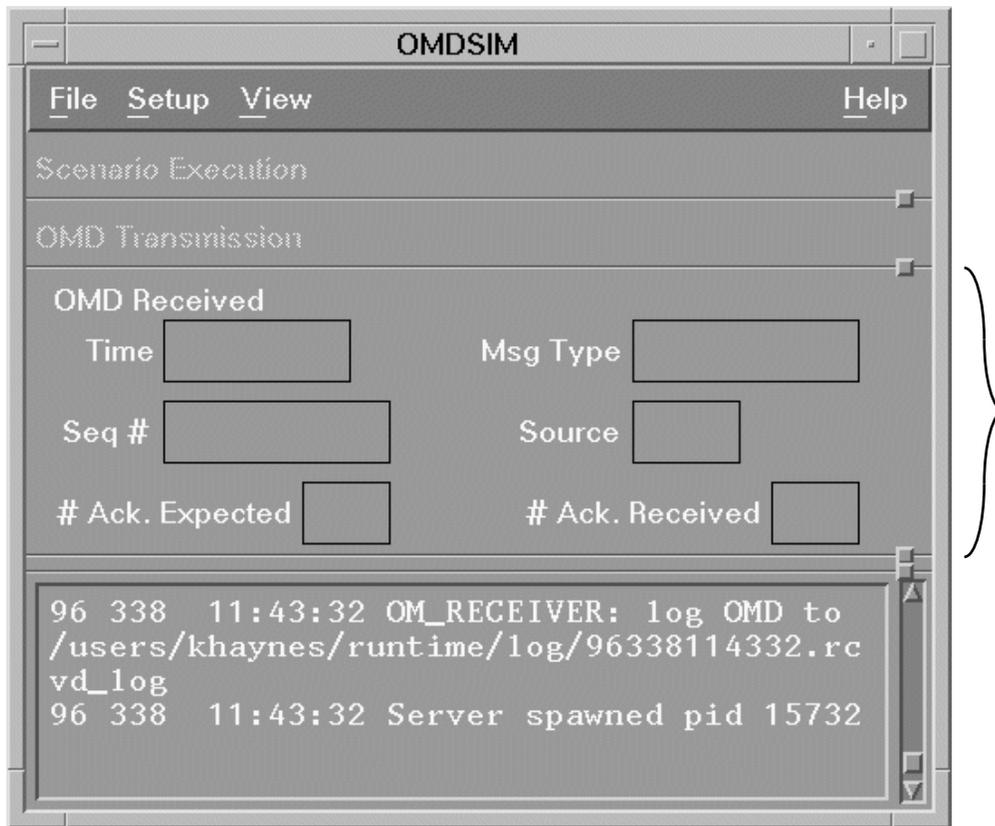
### 3.1.4 OMD Transmitted Panel

The OMD Transmitted Panel (Figure 3-4) displays information about OMD that OMDSIM transmits. The OMD Transmitted Panel is active only when OMDSIM is logging the OMD it transmits (see the *Log OMD Transmitted* option in the File menu, Section 3.2.8).

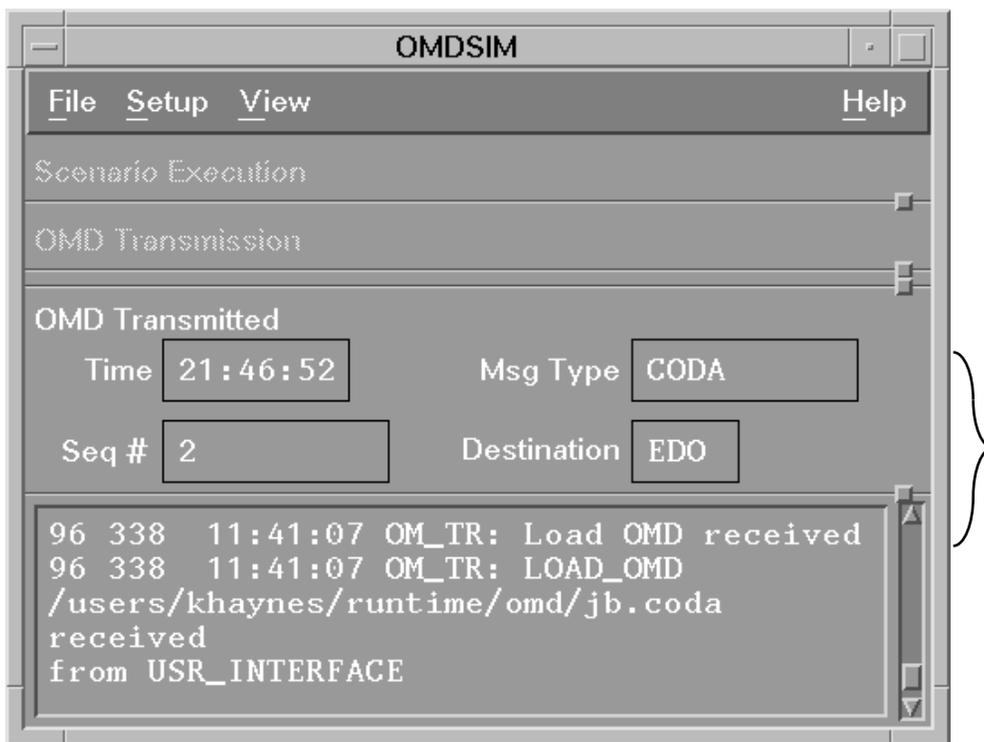
This panel contains no controls, and is for information display only.

### 3.1.5 Status Log Panel

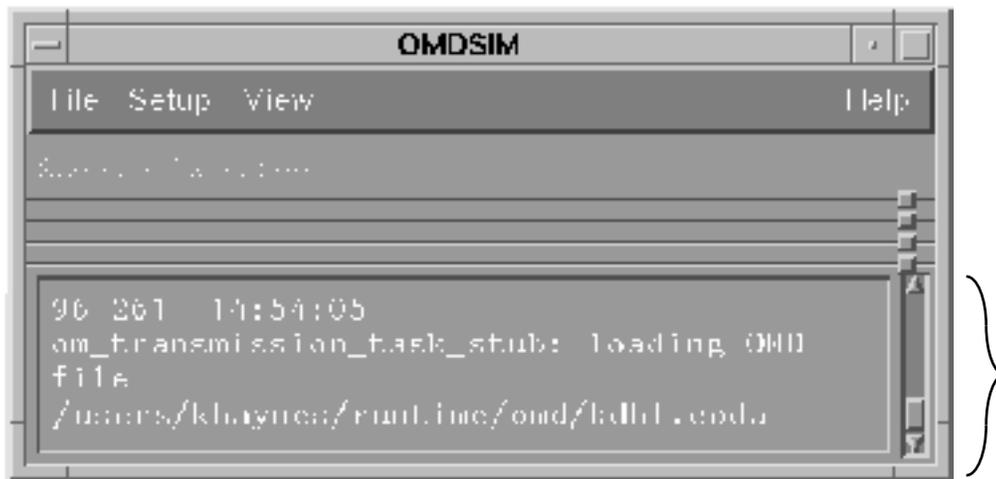
The OMDSIM Status Log Panel (Figure 3-5) shows the OMDSIM messages that indicate the status and progress of OMDSIM activities.



**Figure 3-3. OMD Received Panel (OMDSIM Main Window)**



**Figure 3-4. OMD Transmitted Panel (OMDSIM Main Window)**



**Figure 3-5. Status Log Panel (OMDSIM Main Window)**

OMDSIM stamps each status log entry with its date and time of occurrence and records it in a log file. When you start OMDSIM, it creates the status log file and gives it a name that includes the date and time of the beginning of the OMDSIM session.

The Status Log panel shows four lines or more, in time order. To see earlier or later messages, use the scroll bar along the right side of the panel. To change the number of lines shown, resize the window vertically.

## 3.2 File Menu Functions

The OMDSIM File menu provides options for access to disk files and communication links associated with the OMDSIM.

### 3.2.1 Open Comm Link

The *Open Comm Link* option in the OMDSIM File menu opens a communications link to the entities with which OMDSIM needs to communicate (EBnet and MPS/LRS/HRS). OMDSIM checks all communications ports and enables communications with external systems (EBnet and MPS/LRS/HRS). You must open a communications link before you can load a scenario or an OMD file.

When a communications link is open, this item is named *Close Comm Link* (see Section 3.2.2).

OMDSIM acts as a client process to MPS/LRS/HRS, and connects via socket with MPS/LRS/HRS when you select *Open Comm Link*. You can make this connection any time after MPS/LRS/HRS has been invoked; you can break it (via *Close Comm Link*) and reestablish it without affecting the MPS/LRS/HRS. (The environment variable ETS\_SUBSYSTEM must be set to “MPS,” “LRS,” or “HRS” to enable the communication with the MPS, LRS, or HRS, respectively.)

### 3.2.2 Close Comm Link

The *Close Comm Link* option in the OMDSIM File Menu terminates communications with the entities with which OMDSIM has been communicating (EBnet and MPS/LRS/HRS).

When a communications link is closed or before a link has been opened, this menu item is named *Open Comm Link* (see Section 3.2.1).

### 3.2.3 Load Scenario

The *Load Scenario* option in the OMDSIM File menu enables you to select a scenario file to be prepared for execution. Select the desired scenario file from the Load Scenario File dialog box (Figure 3-6). (See Section 1.5.5 for details on using file selection dialog boxes.)

Only one scenario can be loaded at any one time, and both a scenario and an OMD file cannot be loaded simultaneously. Therefore, the *Load Scenario* option is available only when no scenario or OMD file is loaded; it is dim otherwise.

### 3.2.4 Unload Scenario

The *Unload Scenario* option in the OMDSIM File menu removes the current scenario from the OMDSIM execution context. The *Unload Scenario* option is available only when a scenario is loaded; it is dim otherwise. If a scenario is loaded, you must unload it before you can load an OMD file.

### 3.2.5 Load OMD

The *Load OMD* option in the OMDSIM File menu enables you to select an OMD file to be prepared for transmission. Select the desired OMD file from the Select OMD File dialog box (Figure 3-7).

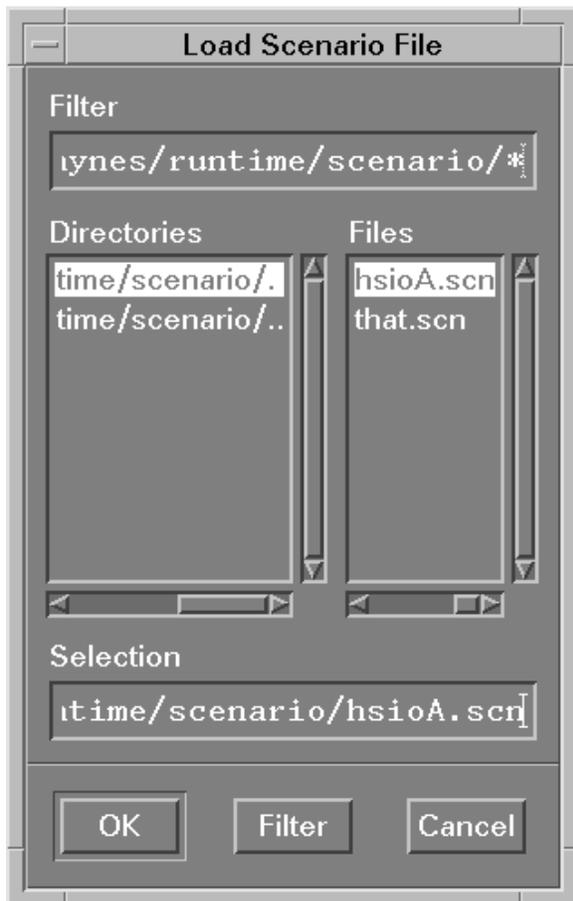


Figure 3-6. Load Scenario File Dialog Box

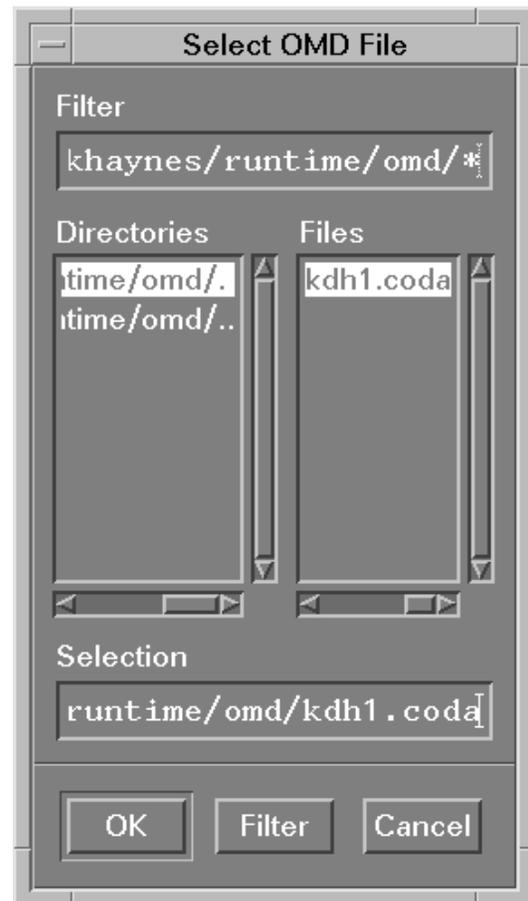


Figure 3-7. Select OMD File Dialog Box

Only one OMD file can be loaded at any one time, and both a scenario and an OMD file cannot be loaded simultaneously. Therefore, the *Load OMD* option is available only when no scenario or OMD file is loaded; it is dim otherwise.

### 3.2.6 Unload OMD

The *Unload OMD* option in the OMDSIM File Menu removes the currently loaded OMD file from the execution context. The *Unload OMD* option is available only when an OMD is loaded; it is dim otherwise. If an OMD file is loaded, you must unload it before you can load a scenario.

### 3.2.7 Log OMD Received

The *Log OMD Received* option allows you to direct OMDSIM to start or stop storing into a log file a record of all OMD that OMDSIM receives. This menu option is a check button, and it reflects the current status of OMD Received logging.

When you start OMD Received logging, OMDSIM opens a file whose name consists of the time the log was started with the extension “.rcvd\_log”.

When you stop OMD Received logging (i.e., when you select this option while OMDSIM received logging is proceeding), OMDSIM stops logging OMD received and closes the log file.

If OMD received are being logged, OMDSIM responds to PDS/EDS Delivery Record OMD by sending PDS/EDS Acceptance Notification OMD; these are generated and transmitted entirely without any action on your part.

*Log OMD Received* is available only when a communications link is open (see Section 3.2.1).

When OMD Transmitted logging ends, you can use the delogger to view the contents of the log file. See Appendix A for details.

### 3.2.8 Log OMD Transmitted

The *Log OMD Transmitted* option allows you to direct OMDSIM to start or stop storing into a log file a record of all OMDs that OMDSIM transmits. This menu option is a check button, and it reflects the current status of OMD Transmitted logging.

When you start OMD Transmitted logging, OMDSIM opens a file whose name consists of the time the log was started with the extension “.trans\_log”.

When you stop OMD Transmitted logging (i.e., when you select this option while OMDSIM transmitted logging is proceeding), OMDSIM stops logging OMD transmitted and closes the log file.

*Log OMD Transmitted* is available only when a communications link is open (see Section 3.2.1).

When OMD Transmitted logging ends, you can use the delogger to view the contents of the log file. See Appendix A for details.

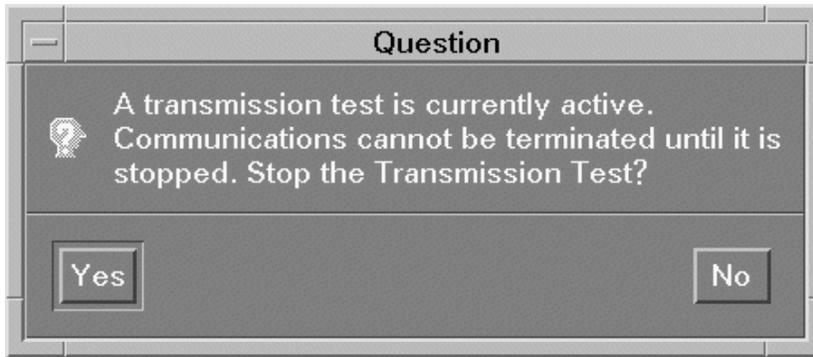
### 3.2.9 Exit

The *Exit* option in the OMDSIM File menu terminates the OMD Simulator and closes any open communication links. If any transmission tests are active, the OMDSIM Exit Confirmation Dialog Box (Figure 3-8) appears, to ask you to confirm the termination.

To complete the exit procedure and terminate OMDSIM, click on **Yes**. To cancel the termination and leave OMDSIM active, click on **No**.

## 3.3 Setup Menu Functions

The OMDSIM Setup menu provide options for creating or modifying a scenario that OMDSIM can execute or an OMD file that it can use in transmitting OMD.

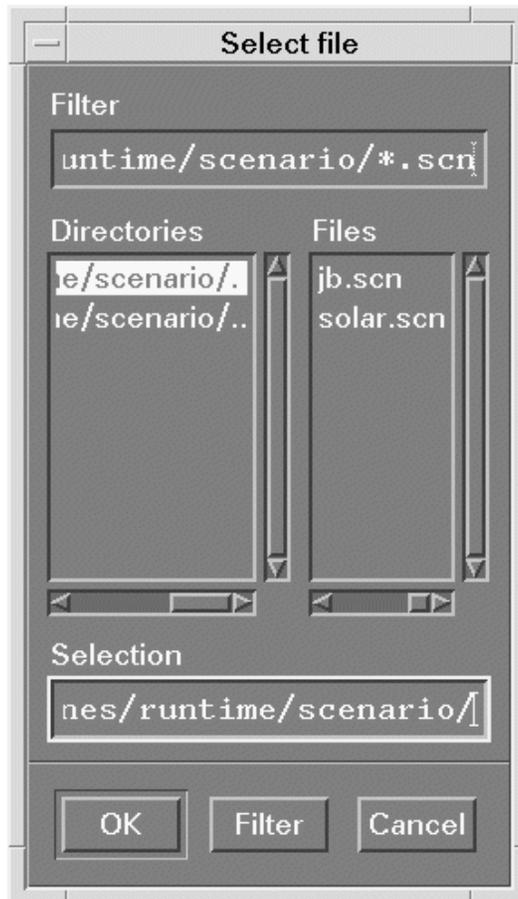


**Figure 3-8. OMSIM Exit Confirmation Dialog Box**

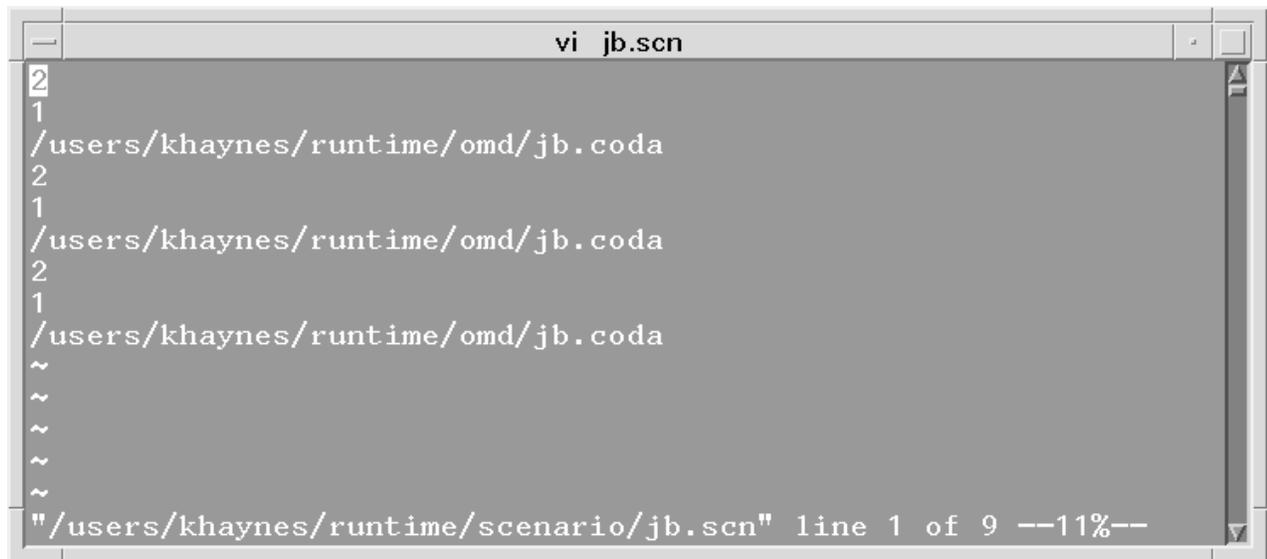
### 3.3.1 Open Scenario

The *Open Scenario* option in the OMSIM Setup menu allows you to select and open a scenario file for editing. Select the desired scenario file from the Select File dialog box (Figure 3-9) and click on **OK**. To create a new scenario, simply enter the name of a new file into the "Selection" text field.

The Scenario Editor window (Figure 3-10) appears, and you can edit the selected scenario file. The Scenario Editor window uses the text editor that is set in your UNIX environment variable



**Figure 3-9. Select Scenario File dialog box**



**Figure 3-10. Scenario Editor**

EDITOR; if this variable is not defined in your environment, the Scenario Editor window uses the vi editor (as in the example below). (See your text editor manual for instructions on how to edit the scenario file.) The Scenario Editor window closes when you quit or exit the text editor.

The OMDSIM scenario file contains records with a minimum of three fields that are separated by any standard C language delimiters (one or more blanks, one or more tabs, one or more line feeds, etc). The fields are, in order:

- Time interval in seconds between CODA transmission (an integer value)
- Duration in minutes of the transmission (an integer value)
- Fully qualified name of the OMD template file to be used for this duration

Ensure that all OMD template filenames you specify in the scenario file refer to files that actually exist.

### 3.3.2 New OMD

The *New OMD* option in the OMDSIM Setup menu allows you to create a new OMD template file. This option has a cascade menu (Figure 3-11) that requires you to identify the type of OMD template file to be created.



**Figure 3-11. OMDSIM Setup “NEW OMD” Cascade Menu**

After you have selected a template file type, the OMD Editor (see Section 3.3.4) appears, initialized with values from the default file for the selected OMD type. If the default file doesn't exist, OMDSIM alerts you that it will initialize all the fields to zero, and the OMD editor is initialized with zeroes in every field of the requested OMD type. You may now modify these values.

The default file name is given by the environment variable ETS\_DEFAULT (which is the nominal “DEFAULT”) and has the extension matching the OMD type (“ . coda”, “. pds”, or “. eds”). The OMD template files are located in the directory given by the environment variable ETS\_OMD\_DIR.

### 3.3.2.1 CODA Report

See Section 3.3.4.1.2 for details on how to specify values for CODA Report OMD.

### 3.3.2.2 PDS Delivery Record

See Section 3.3.4.1.3 for details on how to specify values for PDS Delivery Record OMD.

### 3.3.2.3 EDS Delivery Record

See Section 3.3.4.1.3 for details on how to specify values for EDS Delivery Record OMD.

### 3.3.3 Open OMD

The *Open OMD* option in the OMDSIM Setup menu allows you to select and open an existing OMD template file so that you can examine and/or change its values. Use the Select OMD File dialog box (Figure 3-12) to choose the OMD file to open. The OMD Editor (see Section 3.3.4) appears with the fields displaying the values specified in the selected file.

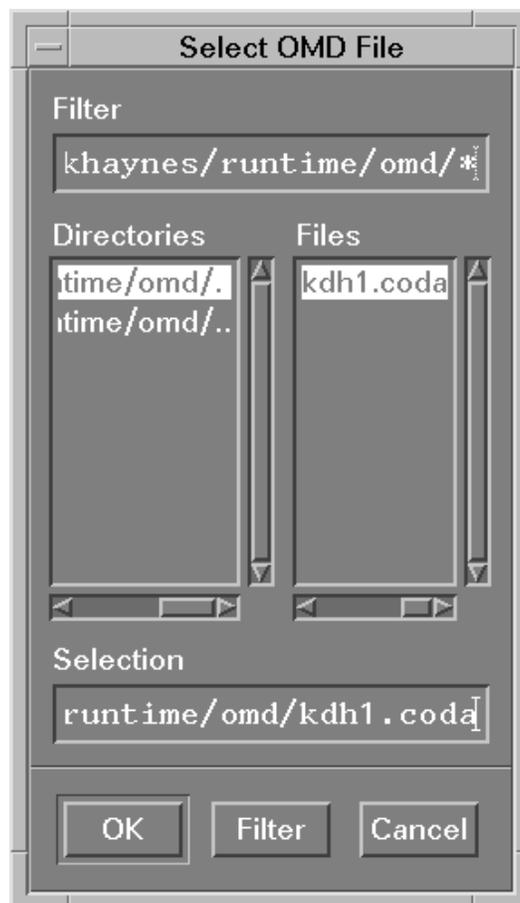


Figure 3-12. Select OMD File Dialog Box

OMD template files are located in the directory given by the environment variable ETS\_OMD\_DIR and have file name extensions corresponding to the OMD type they represent. The extension must reflect the OMD type for further processing to occur.

### 3.3.4 OMD Editor

The OMD Editor window appears after you select *Open OMD* or *New OMD* from the OMDSIM Setup menu (see Sections 3.3.2 and 3.3.3, above). The OMD Editor window consists of panels (Figures 3-13 through 3-24) that display logical or functional parts of the OMD (according to the specific OMD type being edited).

#### 3.3.4.1 OMD Editor Panels

The entire set of OMD Editor panels will probably be larger than can fit on the screen, so the OMD Editor window has scroll bars for scrolling the full display. Each OMD type has a different collection of panels. For an existing file, the OMD Editor identifies the OMD type from the file extension; for a new OMD, the type you selected from the *New OMD* cascade menu (Figure 3-11) determines the OMD type.

The collection of panels for each OMD type is as follows:

- CODA Report
  - Ground Message Header Panel (Section 3.3.4.1.1)
  - CODA Report Content Indicators Panel (Section 3.3.4.1.2.1)
  - Return Link Physical Channel Panel (Section 3.3.4.1.2.2)
  - Forward Link Processing Function Panel (Section 3.3.4.1.2.3)
  - CCSDS VCDU Service (Section (3.3.4.1.2.4))
- PDS Delivery Record
  - Ground Message Header Panel (Section 3.3.4.1.1)
  - Exchange Date Unit Label Panel (Section 3.3.4.1.3.1)
  - PDS Delivery Record Label Panel (Section 3.3.4.1.3.2)
  - PDS Delivery Record PVL Statements Panel (Section 3.3.4.1.3.3)
- EDS Delivery Record
  - Ground Message Header Panel (Section 3.3.4.1.1)
  - Exchange Date Unit Label Panel (Section 3.3.4.1.3.1)
  - EDS Delivery Record Label Panel (Section 3.3.4.1.3.2)
  - EDS Delivery Record PVL Statements Panel (Section 3.3.4.1.3.3)

The following sections discuss all the OMD Editor panels in order, from the top to the bottom of the window. The panels for the PDS and EDS Delivery Report OMD messages are identical, so they are described together.

##### 3.3.4.1.1 Ground Message Header Panel

All OMD types have the Ground Message Header panel (Figure 3-13), the first panel in the OMD Editor. This panel displays the header values in the current OMD template file (using default values if the OMD template is new).



**Figure 3-13. OMD Editor Ground Message Header Panel**

Use the Source list field to select the source of the OMD, and use the Destination list field to select its destination. (See Section 1.3.6.6 for details on using list fields.)

The “Message Type” field shows the type of OMD you are editing. You cannot change this value: The OMD are always transmitted as this type.

The “Mission’s Spacecraft ID” field shows the spacecraft name for the OMD you are editing. You cannot change this value.

To indicate whether or not this OMD is a test OMD, select or deselect the **Test** check button. (The test option is set by default.)

To remove the date and time from the OMD, select the **Flag Bit** check button.

### 3.3.4.1.2 CODA Report Editor Panels

The OMDSIM OMD Editor provides four panels for modifying CODA Report parameters: the CODA Report Content Indicators panel (Figure 3-14), the Return Link Physical Channel (RLPC) panel (Figures 3-15 through 3-17), the Forward Link Status Block (FLSB) panel (Figure 3-218) and the CCSDS VCDU Service panel (Figure 3-19).

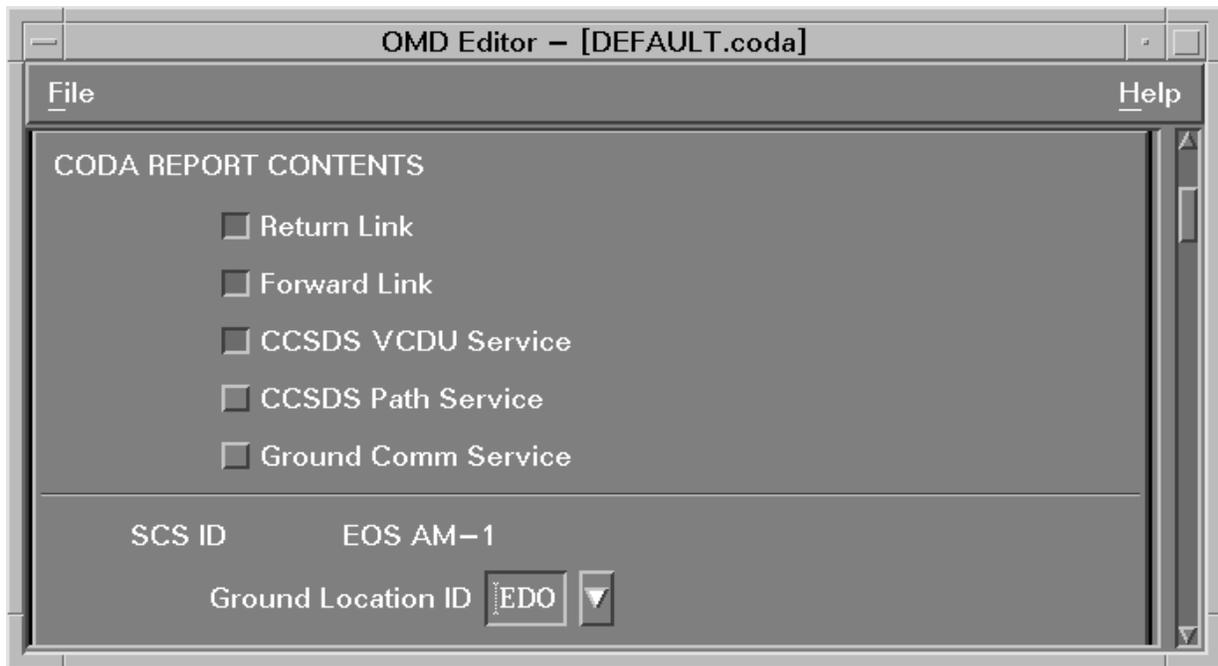
The RLPC, FLSB, and CCSDS VCDU panels include settings for a substantial number of count parameters. For each count parameter, you can specify that it be incremented automatically or remain constant for each successive transmission from the same CODA Report template. To make it increment automatically, select the **Auto** radio button, and enter the increment and the period (in seconds) between applications of that increment to the present value of the counter. To make it constant, select the **Static** radio button.

#### 3.3.4.1.2.1 CODA Report Content Indicators Panel

The CODA Report Content Indicators panel (Figure 3-14) sets the makeup of the CODA report.

The first section determines which of the five optional sections of information the CODA report will contain (only return link, forward link and CCSDS VCDU service information are applicable to EOS-AM1). To include a specific section of information in the CODA report, select the check button for that kind of information. To remove a section of information from the CODA report, deselect its check button.

Once you have specified the sections, one CODA Report Editor panel becomes available for each section of CODA Report information. Each panel is active and available only if its information type is



**Figure 3-14. CODA Report Content Indicators Panel**

selected; it is dim otherwise. (However, the OMD Editor / CODA Report Editor retains all settings and values in an inactive/unavailable panel until you exit the editor, and if you make an inactive panel active by selecting its kind of information in the CODA Report Content Indicators panel, those settings and values are displayed.)

The second section of the CODA Report Content Indicators panel provides an opportunity for the user of the OMDSIM system to enter the Ground Location ID portion of the SCS ID from the list assigned by EDOS. The default value for this choice is “ETS”.

#### 3.3.4.1.2.2 Return Link Physical Port Status Block

The Return Link Physical Channel panel (Figures 3-15 through 3-17), is active when the CODA Report contents include the Return Link data.

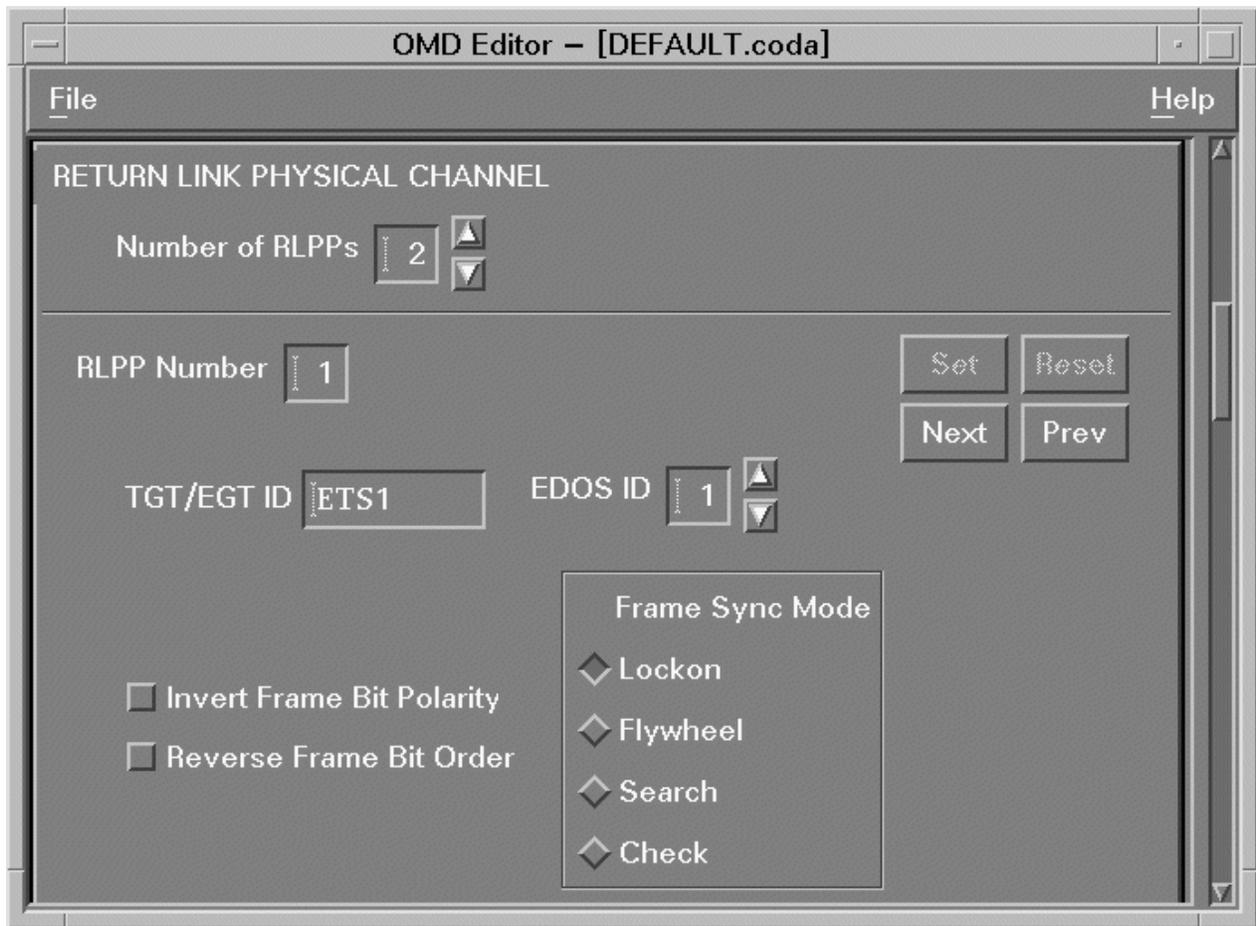
The first section in the RLPC panel (Figure 3-15) allows you to set the number of Return Link Physical Ports (RLPPs), or RLPP TGT Ports, that will be in the OMD. Use the “Number of RLPPs” spinner to set this number, which may be 0 to 2.

The second section of the RLPC panel (Figures 3-15 and 3-16) allows you to set parameters for one or more individual RLPPs. To select a specific RLPP, either enter its number into the “RLPP Number” field or click on the **Next** or **Prev** pushbuttons until you see the RLPP number you want.

Enter and/or select the values and options for the RLPP (as described below). The settings for an RLPP include the settings for all VCIDs in that RLPP (see the paragraphs on setting VCID values and options, below), and you must set the VCIDs before setting the RLPP.

To save the entered values, click on the **Set** pushbutton. (You must save the values if you want OMDSIM to use them.) To restore the values and options to their previously saved settings, click on the **Reset** pushbutton. (The **Set** and **Reset** pushbuttons are both dim when you haven’t changed any of the values and thus there aren’t any changes to be set or reset.)

You can set the RLPP count parameters to be incremented automatically or to remain static. To make the count static throughout the test, click on the **Static** radio button and specify a count value in the “value” field. To make the count ramped automatically during the test, click on the **Auto** radio button



**Figure 3-15. Return Link Physical Channel Panel (1 of 3)**

and enter the desired values in the “increase” and “period” fields. “Increase” is the number that is added to the count after the specified period, and “period” is the time in seconds between successive updates to the count.

An RLPP may contain zero to eight (0 to 8) Virtual Channel IDs (VCIDs). Use the “Number of VCIDs” spinner to set this number. (See Section 1.3.6.4 for details on the use of spinners.)

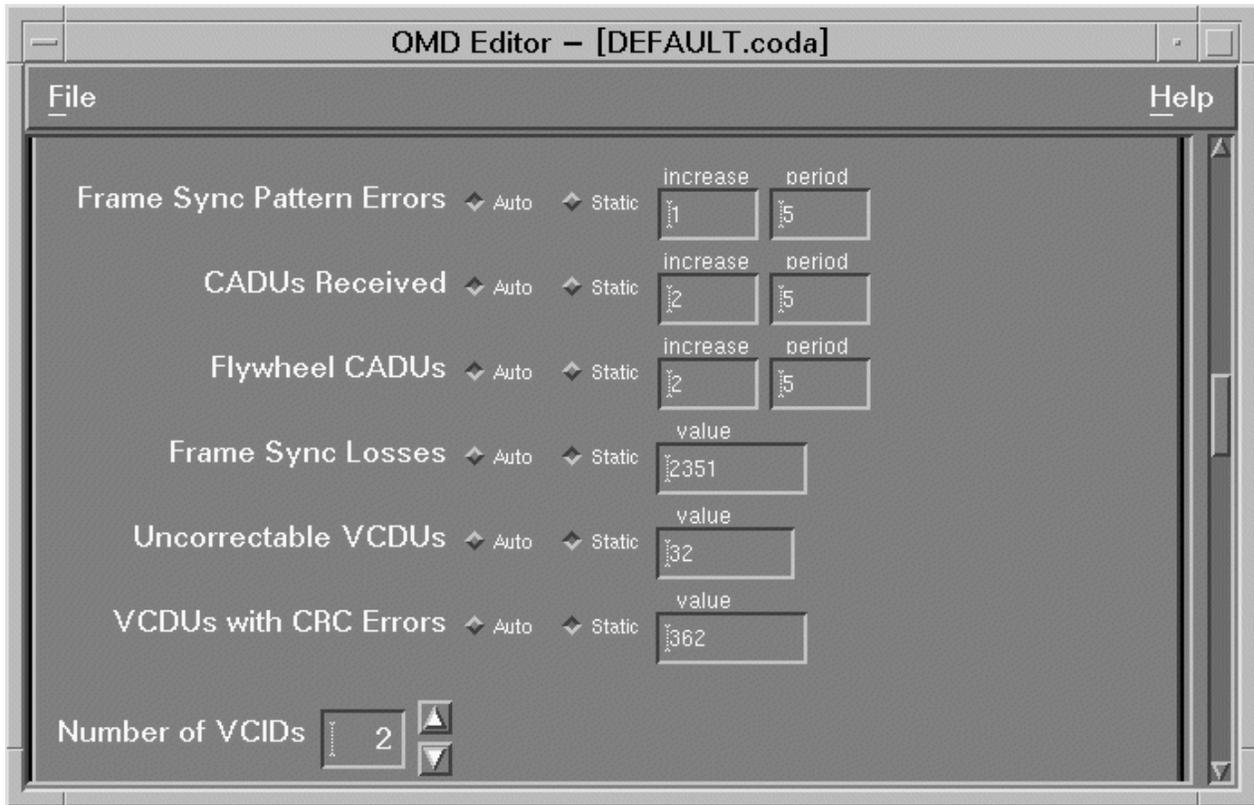
The last section of the RLPP panel (Figure 3-17) allows you to set parameters for one or more individual VCIDs in the RLPP. To select a specific VCID, either enter its number into the “VCID Number” field or click on the **Next** or **Prev** pushbuttons until you see the desired VCID number.

Enter and/or select the values and options for the VCID (as described below).

To save the entered values, click on the **Set** pushbutton for the VCID and then click on the **Set** pushbutton for the RLPP. (**IMPORTANT:** You must save the values by clicking on the **Set** pushbuttons in both the VCID and RLPP areas if you want the values to be in the template.) To restore the values and options to their previously saved settings, click on the **Reset** pushbutton. (The **Set** and **Reset** pushbuttons are both dim when you haven’t changed any of the values and thus there aren’t any changes to be set or reset.)

To make the count static throughout the test, click on the **Static** radio button and specify a count value in the “value” field.

To make the count ramped automatically during the test, click on the **Auto** radio button and enter the desired values in the “increase” and “period” fields. “Increase” is the number that is added to the



**Figure 3-16. Return Link Physical Channel Panel (2 of 3)**



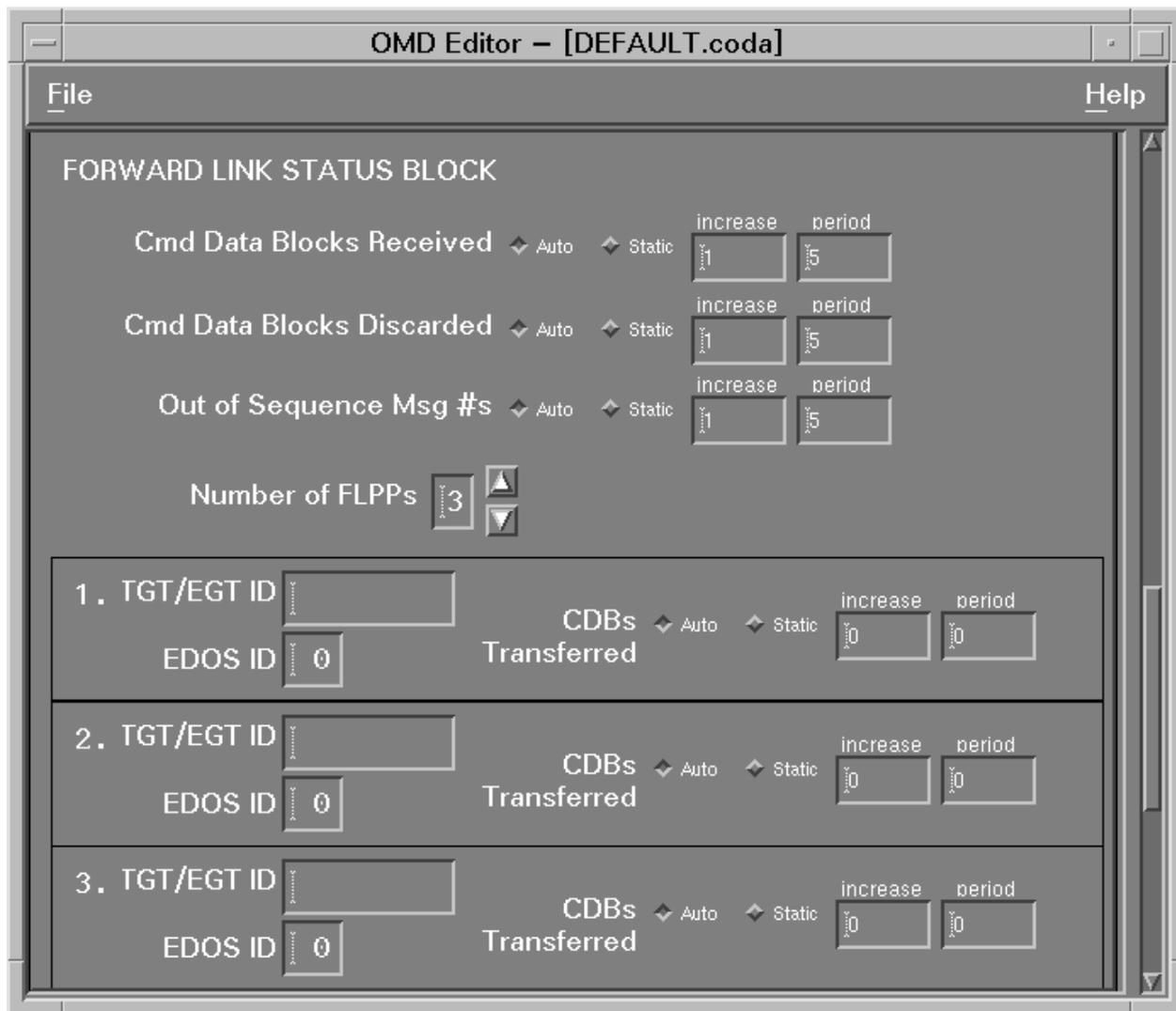
**Figure 3-17. Return Link Physical Channel Panel (3 of 3)**

count after the specified period, and “period” is the time in seconds between successive updates to the count.

### 3.3.4.1.2.3 Forward Link Status Block Panel

The Forward Link Status Block (FLSB) panel (Figure 3-18) is active when the CODA Report contents include the Forward Link data.

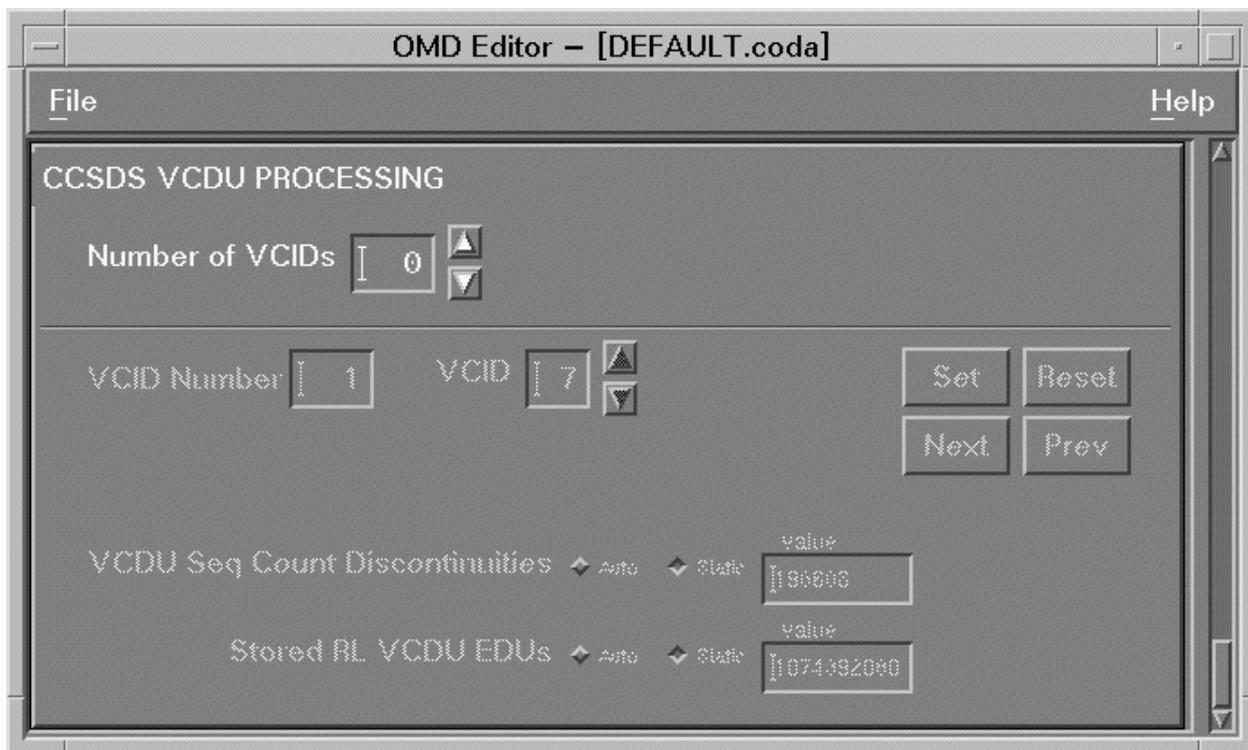
Set the counters for the FLSB overall and for the number of Forward Link Physical Ports (FLPPs). This panel shows all available FLPPs, so it does not include **Set**, **Reset**, **Next**, and **Prev** pushbuttons. To set the values for a particular FLPP, ensure that the number of FLPPs in the FLSB includes the desired FLPP, and change the desired fields.



**Figure 3-18. Forward Link Status Block Panel**

### 3.3.4.1.2.4 CCSDS VCDU Processing Panel

The CCSDS VCDU panel (Figure 3-19) is active when the CODA Report contents include the CCSDS VCDU data. The first section of this panel allows you to set the number of VCIDs to be included in the reports generated from this template. The number of VCIDs should be consistent with the number of VCIDs represented throughout the CODA, but there is no operational constraint to make it so in OMDSIM. For the sake of testing, you may establish information for up to eight (8)



**Figure 3-19. CCSDS VCDU Panel**

VCIDs. For each VCID you may enter simulated counter information for the number of VCDU Sequence Count Discontinuities and for the count of stored return-link VCDU EDUs for this VCID. To make a count static throughout the test, click on the **Static** radio button and specify a count value in the “value” field.

To make a count ramped automatically during the test, click on the **Auto** radio button and enter the desired values in the “increase” and “period” fields. “Increase” is the number that is added to the count after the specified period, and “period” is the time in seconds between successive updates to the count.

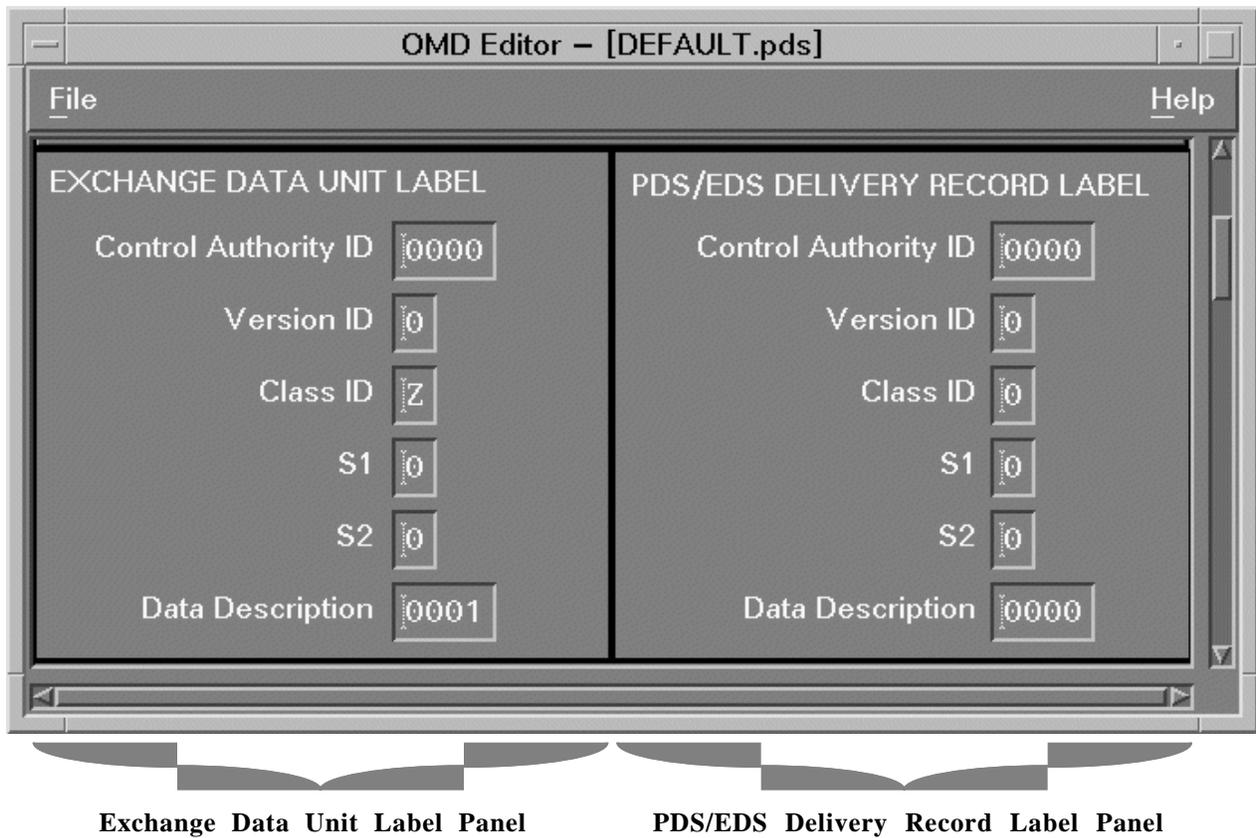
Note: The VCIDs relevant to CCSDS VCDU processing are different from the VCIDs relevant to RLPPs.

### 3.3.4.1.3 PDS and EDS Delivery Record Editor Panels

EDS Delivery Records and PDS Delivery Records are used by the ETS HRS subsystem to provide additional information about Expedited Data Sets (EDSs) and Production Data Sets (PDSs). After files for a PDS or an EDS are successfully transferred to a DAAC, ETS sends to the DAAC the EDS/PDS Delivery Record, providing notification of the data set’s presence. The EDOS Ground Message Header identifies whether this message is a PDS or an EDS Delivery Record.

The EDS/PDS Delivery Record consists of an EDOS Ground Message Header, an Exchange Data Unit Label, an EDS/PDS Delivery Record Label, and EDS/PDS Delivery Record PVL Statements.

Figures 3-20 through 3-24 depict the OMD Editor panels for the EDS/PDS Delivery Record OMD. Like the CODA Report panels, some of these panels contain **Set**, **Reset**, **Next**, and **Prev** buttons for subsections and *Auto* and *Static* options for count parameters. These features are operated and behave in the same way for both types of OMD.



**Figure 3-20. Exchange Data Unit Label Panel and PDS/EDS Delivery Record Label Panel**

#### 3.3.4.1.3.1 Exchange Data Unit Label Panel

The Exchange Data Unit Label panel (Figure 3-20, left side) allows you to set 20 bytes of identification information in ASCII text format.

You can modify six elements of the label; figure 3-20 shows the default set of “correct” values, needed as part of the DAAC required format. (OMDSIM also calculates as part of the exchange data unit label the length in ASCII of the PDS/EDS Delivery Record Label and PVL statements, including white space.)

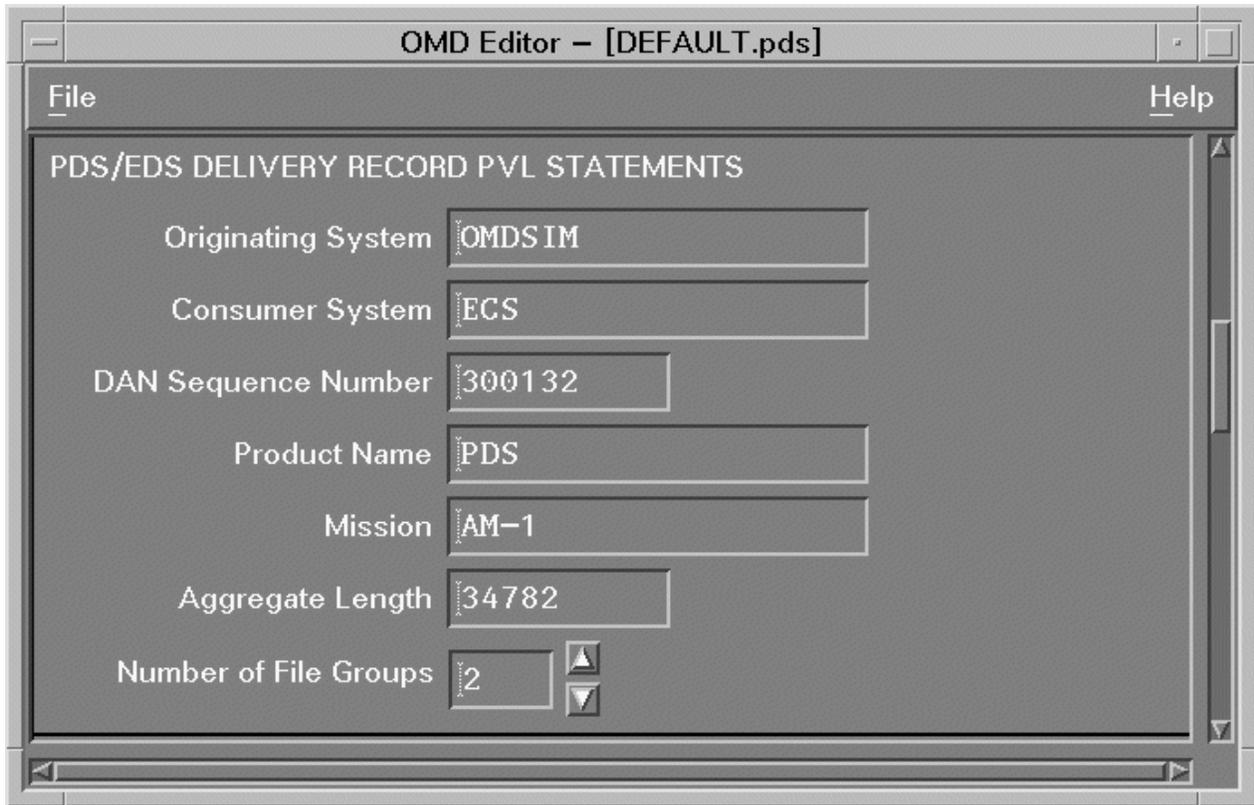
#### 3.3.4.1.3.2 PDS/EDS Delivery Record Label Panel

The PDS/EDS Delivery Record Label panel (Figure 3-20, right side) allows you to set 20 bytes of identification information in ASCII text format.

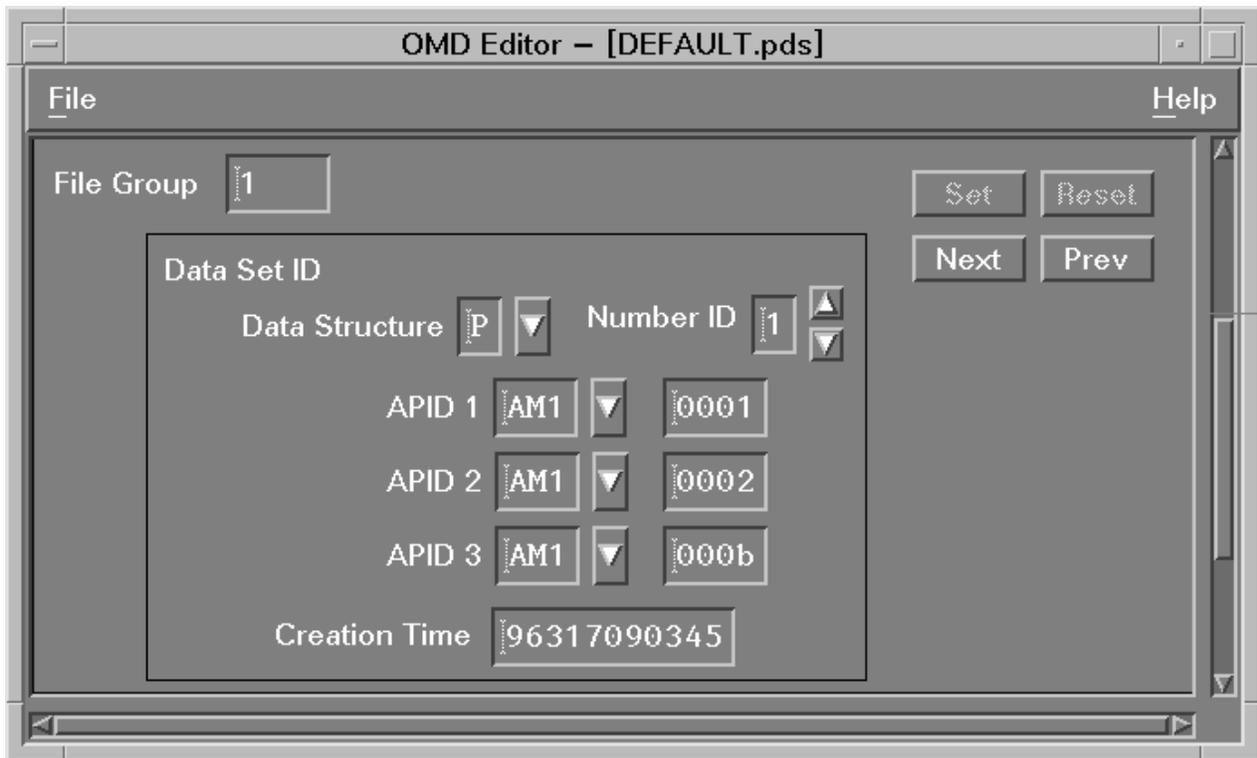
You can modify six elements of the label; figure 3-20 shows the default set of “correct” values, needed as part of the DAAC required format. (OMDSIM also calculates as part of the exchange data unit label the length in ASCII of the PDS/EDS Delivery Record Label and PVL statements, including white space.)

#### 3.3.4.1.3.3 PDS/EDS Delivery Record PVL Statements Panel

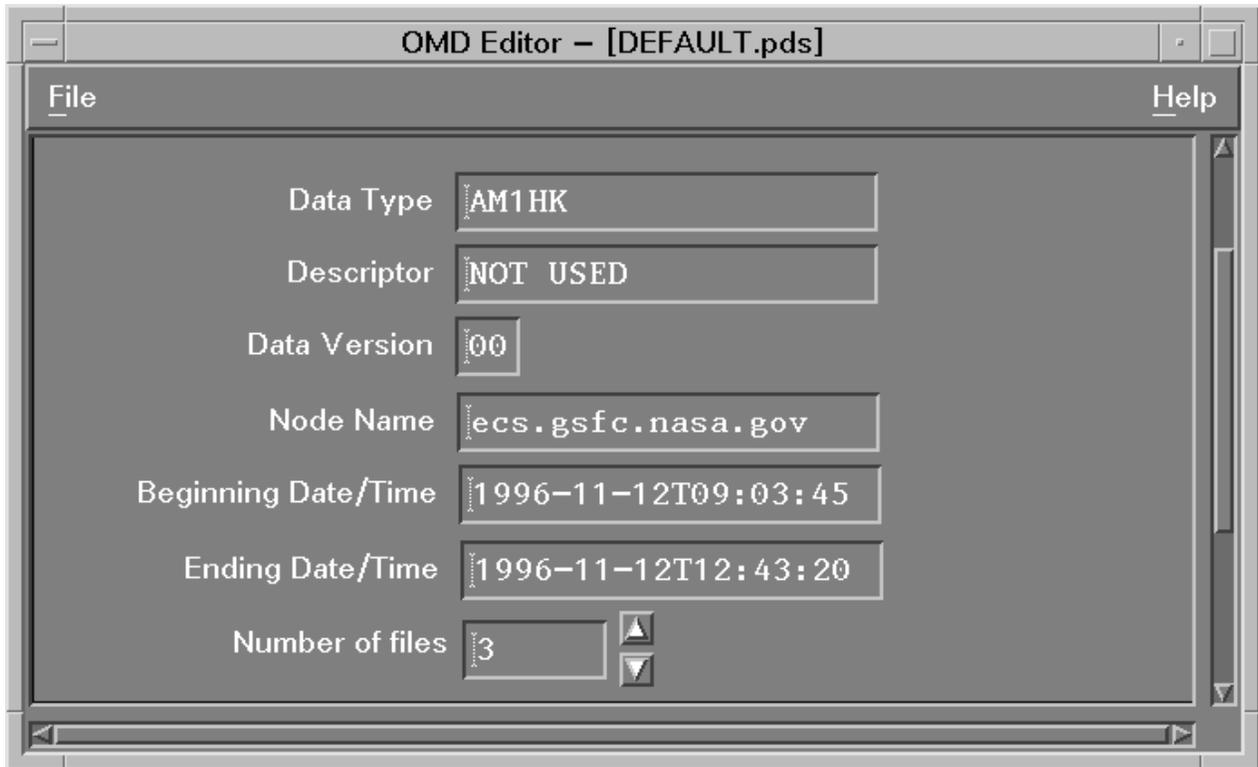
The PDS/EDS Delivery Record PVL Statements (Figures 3-21 through 3-24) represent the operations management data specific to groups of files (PDS or EDS) representing one data set, the first of which



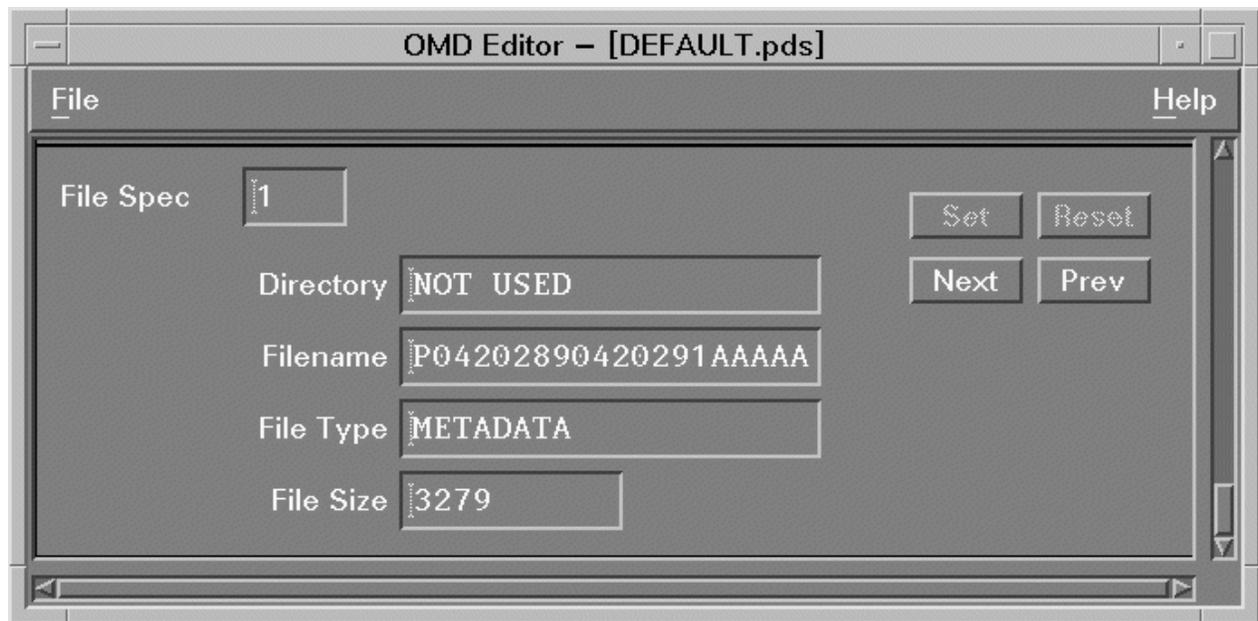
**Figure 3-21. PDS/EDS Delivery Record PVL Statements (1 of 4)**



**Figure 3-22. PDS/EDS Delivery Record PVL Statements (2 of 4)**



**Figure 3-23. PDS/EDS Delivery Record PVL Statements (3 of 4)**



**Figure 3-24. PDS/EDS Delivery Record PVL Statements (4 of 4)**

is the construction record. One group consists of a minimum of two files, the construction record and the data proper. Since the number of files is generally unknown, you may establish template

information for up to 25 groups of up to eight (8) files. As shown in these figures, most of the PVL information is constant (e.g., mission spacecraft ID) or occasionally updated (e.g., node name of destination computer on which the data set files reside). You are expected to create suitable templates (one time) for creating delivery records specific for the test data, and to update them (infrequently) as testing requires.

Certain fields in the PDS/EDS delivery record, such as the delimiters between file information and group information, are maintained by OMDSIM, and you cannot modify them.

### 3.3.4.2 OMD Editor Menu Functions

#### 3.3.4.2.1 OMD Editor File Menu Functions

The OMD Editor File menu (Figure 3-25) provides for creating and accessing OMD template files.



**Figure 3-25. OMD Editor File Menu**

##### 3.3.4.2.1.1 New

The *New* option in the OMD Editor File menu displays a cascade menu (a submenu) that asks you to select the OMD type (Figure 3-26). The OMD Editor window is initialized with the default parameters for the OMD of the type you selected. (For more information, see section 3.3.2.)



**Figure 3-26. OMD Editor New OMD Cascade Menu**

##### 3.3.4.2.1.2 Open

The *Open* option in the OMD Editor File menu brings up a file selection dialog box. To use the OMD values from a file, select an OMD file from the file selection dialog box and click on **OK**.

##### 3.3.4.2.1.3 Save

The *Save* option in the OMD Editor File menu saves the current OMD parameters to the same file from which they were read or the file to which they were most recently saved. The file will include any changes you have made to the parameters. No dialog box appears because no further action from you is required. (If the OMD template is new, a file selection dialog box will appear to request a file name and directory for the new OMD file.) (See Section 1.3.3.4 for details on using file selection dialog boxes.)

#### 3.3.4.2.1.4 Save As

The *Save As...* option in the OMD Editor File menu allows you to save the current OMD parameters to a different file name. Select or enter the desired OMD file name in the Save File As dialog box. The OMD file name extension must reflect the OMD type: “.coda,” “.pds,” or “.eds”.(See Section 1.3.3.4 for details on using file selection dialog boxes.)

#### 3.3.4.2.1.5 Load

The *Load* option in the OMD Editor File menu causes the current OMD file to be loaded into memory to wait for the next transmission signal. If the current OMD template has no file name associated with it (has not been saved after modification) a file selection dialog box (Figure 1-3) appears to request a file name. (See Section 3.2.5 for a description of loading an OMD file.) You cannot load an OMD file while a transmission test is active or a scenario is being executed.

#### 3.3.4.2.1.6 Exit

The *Exit* option in the OMD Editor File menu terminates the execution of the OMD Editor software. It closes the OMD Editor window and any open OMD Editor dialog boxes.

If the current OMD file has been modified but has not been saved, a question dialog box pops up to ask you if you want to save the OMD file. To save the OMD and close the OMD Editor, click on **Yes**. To close the OMD Editor without saving the OMD file, click on **No**. To cancel the exit and return to the OMD Editor (without saving the OMD file), click on **Cancel**.

### 3.3.4.2.2 OMD Editor Help Menu Functions

The OMD Editor *Help* menu options allow you to get information about using the OMD Editor window.

#### 3.3.4.2.2.1 About OMD Editor

The *About OMD Editor* option in the OMD Editor *Help* menu allows you to get help on the OMD Editor window in general. When you select this option, an information dialog box appears with information about the top-level OMD Editor Help window. (For an example of an information dialog box, see section tbd.)

To close the OMD Editor Help window, click on **Close**.

#### 3.3.4.2.2.2 On context

The *On context* option in the OMD Editor *Help* menu allows you to get help about a specific area of the OMD Editor window. The pointer changes shape to a hand with the index finger extended. To select the area of the OMD Editor window for which you want information, click on that area, using the tip of the index finger as the indicator.

## 3.4 View Menu Functions

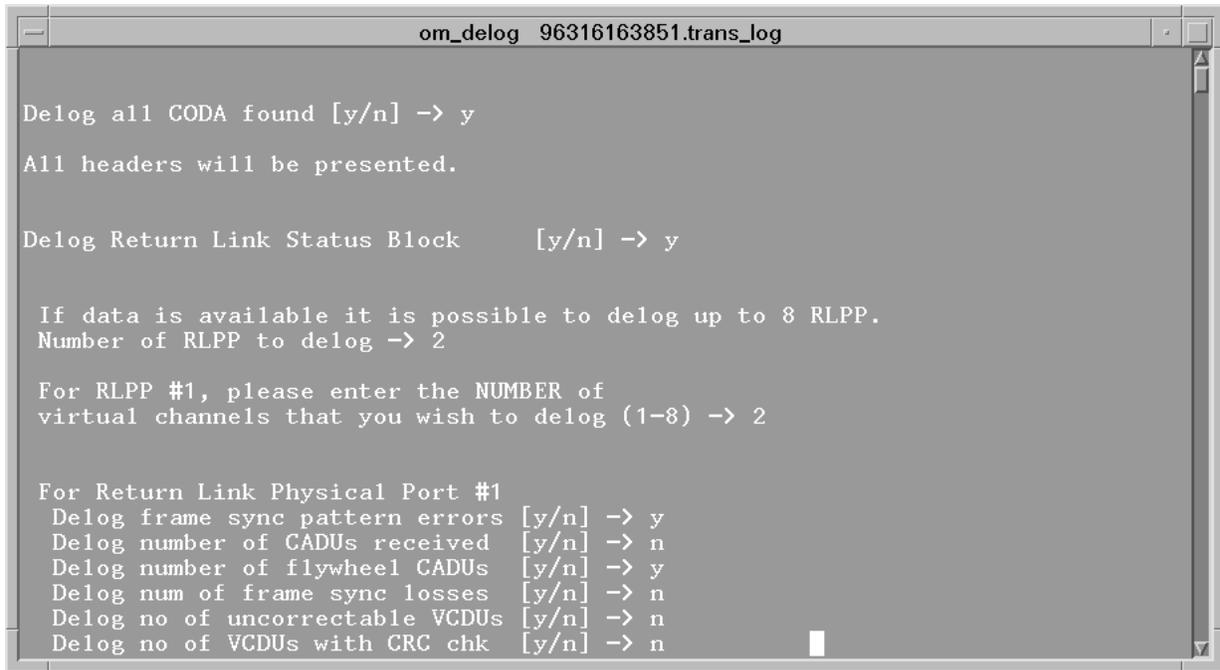
### 3.4.1 OMD Logs

The *OMD Log* option in the OMDSIM *View* menu allows you to view log files of OMD received or transmitted by OMDSIM.

When you select *OMD Log*, a file selection dialog box appears. The OMD Received log has a filename extension of “.rcvd\_log” and the OMD Transmitted log has an extension of “.trans\_log”. Select one of these logs to be viewed and click on **OK**.

A terminal window appears (Figure 3-31), executing the `om_delog` program. Follow the procedures outlined in Appendix C to use `om_delog`. The `om_delog` program stores its results in an ASCII disk file that is named “OM\_Delogs” and is located on your workstation in the directory from which OMDSIM was started. The OM\_Delogs file can be viewed through any ASCII text editor or printed through any print utility.

**Important:** The `om_delog` program always saves the results of delogging in the file named “OM\_Delogs”. If you want to view the logs of both OMD received and OMD transmitted, you must view one before you delog the other. Otherwise, when you delog the second type of OMD, `om_delog` will overwrite the delog of the first type of OMD, and the first delog will be lost.



**Figure 3-27. om\_delog Terminal Window**

The OMD Log option does not require communication with any process external to OMDSIM and so is always available.

### 3.5 Help Menu Functions

The OMDSIM Help menu (Figure 3-28) enables you to obtain information about OMDSIM.



**Figure 3-28. OMDSIM Help Menu**

#### 3.5.1 Help About OMDSIM

The *About OMDSIM* option in the OMDSIM Help menu enables you to get help on OMDSIM in the form of a brief description of the OMDSIM process. An information dialog box appears with this information. To close the dialog box, click on **Close**.

To close the information dialog box, click on **Close**.

### 3.5.2 Help On Context

The *On Context* option in the OMDSIM Help menu enables you to get help on OMDSIM in the form of information about a particular item in the OMDSIM window. Select *On Context* and the mouse pointer turns into a pointing hand. To obtain help on an item or a section of the window, place the index finger of the pointing hand over the item and click. An information dialog box appears with the information about that item or window area.

To close the information dialog box, click on **Close**.

# Appendix A – om\_delog

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## A.1 Purpose

The om\_delog utility is provided as part of OMDSIM as an aid to verifying the contents of CODA and other OMD that have been transmitted and logged to a binary file, and OMD that have been received from other EOSDIS test elements. To bring it up, select the *OMD Log* option from the View menu on the OMDSIM main window. A dialog box appears that is set by default to the directory designated to contain log files by the system administrator, and the file selections are filtered, again by default, to show only files that have the extension .trans\_log. These files are the binary files containing a recapitulation of the CODA transmitted and saved.

The file names are time tags, and it is possible to rename any of them to more meaningful identifications or move any to more appropriate locations for later analysis. You may highlight a selection, then choose **OK** to bring up the delogger, or double-click on a selection.

## A.2 Initialization Flags

The delogger prompts you in a hierarchical manner to minimize the delog output. At the highest level you may choose to delog all CODA found by responding "y" to the query "Delog all CODA found [y/n] -> ". The option to delog any of the (optional) CODA status blocks present is then shown. If you select to delog Return Link Status Blocks by typing in "y" to the next prompt, then you will be prompted to supply the maximum number of return link physical ports for which you desire delogged information. For AM-1, up to 8 are possible. For each RLPP you will be asked if you wish to delog counters for one or more (up to 8) virtual channels. For each, you will be sync pattern error counter, the number of CADUs received, the number of CADUs received when in flywheel mode, the number of frame sync losses, the number of uncorrectable VCDUs, and the number of VCDUs with CRC check. For each virtual channel for each of each return link physical port, you may choose to delog the number of correctable VCDUs by VCID and the number of corrected VCDUs by VCID.

Next, the prompt to delog the optional Forward Link Status Block is presented. If you select this, prompts are given to delog the number of command blocks received, the number of command blocks discarded and the number of out of sequence ground message headers. You may then select to delog counters for up to 8 FLPP. For each, you will be prompted to delog the number of command blocks transferred.

Next, you will be prompted to delog the CCSDS VCDU Processing Status Block. You may select to delog counters from 1 to 8 virtual channels. For each, you may delog the count of sequence discontinuities and the number of return link VCDU EDUs.

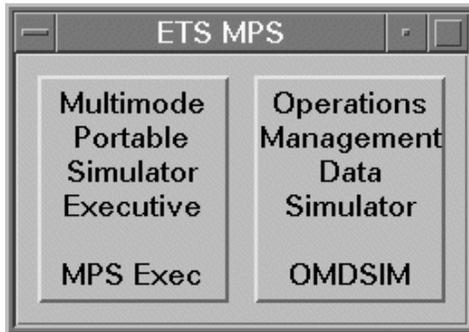
Other OMD may be delogged if they are present in the log file. The delogger prompts you to select delogging of EDS/PDS Delivery Records, and finally, you may choose to delog the contents of the Session Contact Summary Report. The information in the Ground message header is displayed to the terminal device, and the sections that you have selected are written, along with the header information, to the file named OMD\_delog in the default directory.

# Appendix B - ETS Menu Controller

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## B.1 Starting Up the ETS Menu Controller

To start the Menu Controller for the ETS MPS or LRS, enter “ets\_mps” or “ets\_lrs” at the login prompt. The ETS Menu Controller Window will appear:



**Figure B-1. ETS Menu Controller Window (MPS)**

The pushbuttons in the ETS Menu Controller window represent the ETS applications that can be executed on the ETS subsystem with which you are running OMDSIM.

## B.2 Starting an ETS Application

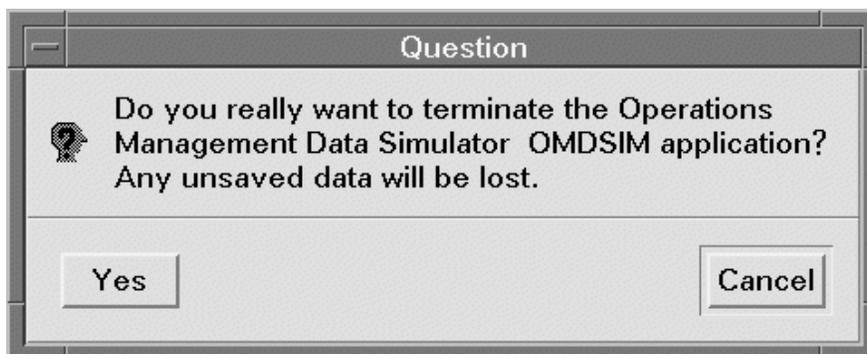
To start an ETS application that is inactive, click on the pushbutton for that application.

Note: ETS applications are initially inactive and must be started when this window first appears.

Note: If you try to start an application that is already active, ETS will interpret the pushbutton click as a command to terminate the application. To recover, cancel the termination (see section 2.1.5.3 for details).

## B.3 Terminating an ETS Application

To stop an active ETS application, click on the pushbutton for that application. Clicking on the button of an active application starts its termination process. A dialog box asks you to confirm termination:



**Figure B-2. ETS Application Termination Confirmation Dialog Box**

To terminate the application, click on **Yes**. To cancel the termination and leave the application active, click on **Cancel**.

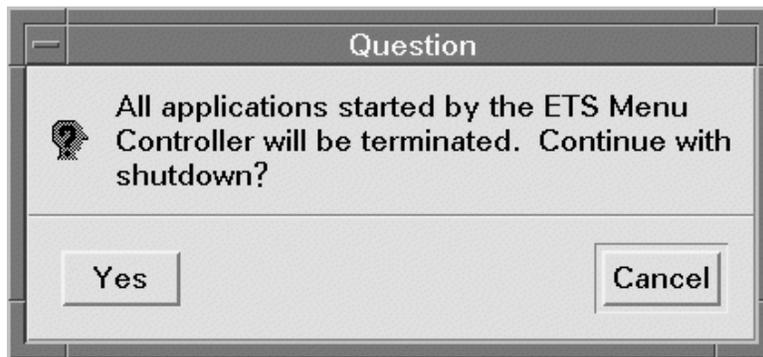
**Note:** If you try to terminate an application that is not active, ETS will interpret the pushbutton click as a command to start the application. To recover, click again on the application's pushbutton in the Menu Controller window and follow the above instructions for termination.

**Warning:** Terminating applications via the Menu Controller is a shortcut. An application terminated in this way does not have the opportunity to ask you about saving any data or files. For a safer alternative, select the *Exit* option from the File menu of the application's main window.

## B.4 Shutting Down the ETS Menu Controller

To shut down the ETS Menu Controller and any active applications, select the *Close* option from the window menu of the Menu Controller window. (To bring up the window menu for any window, click on the square with a bar in it , in the upper left corner of the window.) If no applications are active, the window will be closed immediately and the Menu Controller terminated.

If there are active applications, the ETS Menu Controller Shutdown Confirmation dialog box (Figure 2-3) will appear to request confirmation of the termination.



**Figure B-3. ETS Menu Controller Shutdown Confirmation Dialog Box**

To continue the ETS MPS/LRS shutdown, click on **Yes**. All active applications will be terminated as if you had requested *and confirmed* their termination through the Menu Controller. To cancel the shutdown and leave the application(s) active, click on **Cancel**.

**Warning:** Terminating applications in this way is a shortcut. An application terminated in this way does not have the opportunity to ask you about saving any data or files. For a safer alternative, select the *Exit* option from the File menu of the application's main window.

# Abbreviations and Acronyms

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APID	Applications Process Identifier
ASCII	American Standard Code for Information Interchange
BER	bit error rate
C&DH	command and data handling
CADU	Channel Access Data Unit
CCSDS	Consultative Committee for Space Data Systems
CLCW	command link control word
cmd	command
CODA	Customer Operations Data Accounting
COP	command operations procedure
CRC	Cyclic Redundancy Check
DAAC	Distributed Active Archive Center
DRAM	dynamic random-access memory
DSN	Deep Space Network
EBnet	EOSDIS Backbone Network
EDOS	EOS Data and Operations System
EDS	Expedited Data Set
EDU	Exchange Data Unit
EOC	EOS Operations Center
EOS	Earth Observing System
EOSDIS	Earth Observing System Data and Information System
ESDIS	Earth Sciences Data and Information System
ETS	EOSDIS Test System
FLPP	Forward Link Physical Port
FLSB	Forward Link Status Block
FOT	Flight Operations Team
FSIO	Frame Synchronization Input Output
GN	Ground Network
GSFC	Goddard Space Flight Center
GUI	graphical user interface
HK	housekeeping
HSIO	High Speed Input/Output
KFTF	Kerberos file transfer protocol
LRS	Low-Rate System (ETS)

MPS	Multimode Portable Simulator (ETS)
MVME	Motorola Versa Module Eurocard
OMD	Operations Management Data
OMDSIM	Operations Management Data Simulator
OSF	Open Software Foundation
PDB	project data base
PDOS	P? Disk Operating System
PDS	Production Data Set
PSS	portable spacecraft simulator
RB	rate buffered
RISC	reduced-instruction-set computing
RLPC	Return Link Physical Channel
RLPP	Return Link Physical Port
SCS	Spacecraft Contact Summary
SCS	source sequence count
SN	Space Network
TBD	to be determined
TDRSS	Tracking and Data Relay Satellite System
TGT	TDRSS Ground Terminal
tlm	telemetry
TSS	TDRSS Summary Session
UTC	Universal Time Coordinated
VCDU	Virtual Channel Data Unit
VCID	Virtual Channel Identifier
VME	Versa Module Eurocard
WGS	Wallops Ground System

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