



StarTool[®] FDM

IMS Option

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Welcome to the StarTool FDM IMS Option

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About This Book

This document describes StarTool® FDM (File and Data Manager) Version 7.7.1. It documents the features, functions, and uses of the StarTool FDM IMS Option, a separately licensed feature of StarTool FDM.

- StarTool FDM** StarTool FDM is a multi-purpose file and data management utility for IBM® mainframe systems. It provides an ISPF-based, menu-driven, integrated interface to a variety of editors and data management tools for PDS, PDSE, VSAM, direct-access, IMS, and Db2 files. A TSO command-line interface is also supported, as well as bulk file processing in batch mode. Customizable option tables and exits make StarTool FDM highly flexible and adaptable to user needs.
- IMS Option** The IMS Option extends the file and data management functionality of StarTool FDM to unique-keyed segments, nonunique-keyed segments, and nonkeyed segments in IBM IMS hierarchical databases.
- Audience** This document is intended for use by z/OS mainframe software developers and IMS database administrators already familiar with the functions and uses of both StarTool FDM and IBM's IMS database management system.

Before You Begin

New Information Change bars in the left margin (shown at left) identify substantive changes to this publication since StarTool FDM Version 7.6.3.

Corrections and Technical Support The Readme file contains updates and corrections to this manual issued after the publication date. It also provides contact information for Micro Focus Customer Support.

Conventions

- Terminology** Throughout this document:
- z/OS refers to the z/OS™ and OS/390® IBM® operating systems.

- StarTool FDM may also be referenced as StarTool or FDM.
- *somnode* is the high-level qualifier you specified for StarTool FDM installation libraries.
- *vrm* is the version, release, and modification level of StarTool FDM without punctuation; for example, for StarTool FDM Version7.7.0, the value of *vrm* is 770.

Typographic Conventions

The following textual conventions are used throughout this document to highlight special information:

Convention	Meaning
Bold	Panel title or field name.
<i>Italics</i>	Introduces new terms, sets off important information, or marks document titles.
UPPERCASE	Indicates keys or key combinations; for example, the ENTER key.
Bright blue	Clickable cross-reference or active hyperlink.
Monospaced	JCL, source code, or message text. Also used for member names, file names, and commands if these are not clear from context.
MONOSPACED UPPERCASE	Required value or literal in code or JCL parameter.
monospaced lowercase	<p>Pattern for a field value or parameter you specify. Number of characters is significant. Upper-case characters are literals. Lower-case characters are placeholders that indicate data type, where:</p> <ul style="list-style-type: none"> y = year m = month d = day a = alphanumeric n = numeric x = other or mixed ? = one-character wild card * = n-character wild card <p>Punctuation other than wild cards must be reproduced in the position shown.</p> <p><i>Examples:</i></p> <ul style="list-style-type: none"> ■ yyyy/mm/dd ■ C'aa' ■ B'nn' ■ D'nn' ■ X'nn'
<i>monospaced italics</i>	Descriptive placeholder for value or parameter you specify, but not a pattern; for example, <i>filename</i> .

Convention	Meaning
Square braces []	Optional parameter or choice of values. May be nested.
Vertical bar	Inside braces, a vertical bar separates mutually exclusive parameter choices or values.
Ellipsis ...	Optional repetitions of a pattern in a list.
Greater-than symbol >	Separates items in a chain of menu or command selections on a GUI client. For example, Start > All Programs > Micro Focus > <i>product_name</i> .

Documentation

All StarTool FDM documentation is provided in Adobe® Portable Document Format (PDF) and may be downloaded from the following Micro Focus website:

<https://www.microfocus.com/support-and-services/documentation/>

No user ID or password is needed to access the documentation.

Related Publications

Available StarTool FDM publications include:

Title	Description
<i>StarTool FDM Installation Guide</i>	System requirements, installation instructions, and configuration information for StarTool FDM.
<i>SER10TY User's Guide</i>	Installation information for SER10TY licensing software and instructions on how to apply license key SERTificates.
<i>StarTool FDM Quick Reference</i>	Overview of StarTool FDM commands, with syntax details for frequently used functions. Includes PEDIT and StarBat subcommands.
<i>StarTool FDM User's Guide</i>	StarTool FDM concepts and facilities, with instructions for using the ISPF-based menu-driven interface.
<i>StarTool FDM Command Reference</i>	TSO command-line syntax and parameter reference, organized alphabetically. Interactive subcommands included for major functions.
<i>StarTool FDM System Services</i>	Advanced reference to operating system calls used by StarTool FDM.
<i>StarTool FDM StarBat Option</i>	Batch-mode interface for bulk changes to data sets. StarTool FDM functions invoked by JCL procedures.
<i>StarTool FDM Db2 Option</i>	StarTool FDM data management functions for Db2 relational database tables, columns, and rows, with SQL processing support.
<i>StarTool FDM IMS Option</i>	StarTool FDM data management functions for IMS hierarchical database files and structures.

Title	Description
<i>StarTool FDM Extended Compare Option</i>	Integrated file comparison utility based on Micro Focus Comparex. Data file versus text file comparison logic.
<i>StarTool FDM Messages</i>	Consolidated message reference for base product and all licensed product options, with error recovery recommendations.

Using the PDF Documentation

To view PDF files, use Adobe® Reader®, which is freely available from Adobe on the World Wide Web at <http://www.adobe.com>. Reader Version 7.0.5 or higher is recommended.



TIP Be sure to download the *full version* of Reader. The more basic version does not include the cross-document search feature.

This section highlights some of the main Reader features. For more detailed information, see the Adobe Reader online help system.

The PDF manuals include the following features:

- **Bookmarks.** All of the online manuals contain predefined bookmarks that make it easy for you to quickly jump to a specific topic. By default, the bookmarks appear to the left of each online manual.
- **Links.** Cross-reference links within an online manual enable you to jump to other sections within the manual and to other manuals with a single mouse click. These links appear in blue.
- **Printing.** While viewing a manual, you can print the current page, a range of pages, or the entire manual.
- **Advanced search.** Starting with Version 6, Adobe Reader includes an advanced search feature that enables you to search across multiple PDF files in a specified directory. (This is in addition to using any search index created by Adobe Catalog—see step 3 below.)

To search across multiple PDF documents at once, perform the following steps (requires Adobe Reader Version 6 or higher):

- 1 In Adobe Reader, select Edit > Search (or press CTRL+F).
- 2 In the text box, enter the word or phrase for which you want to search.
- 3 Select the **All PDF Documents in** option, and browse to select the folder in which you want to search. (If you have a document open that has an Adobe Catalog index attached, you can leave the **In the index named...** option selected to search across all the manuals in the index.)
- 4 Optionally, select one or more of the additional search options, such as **Whole words only** and **Case-Sensitive**.

- 5 Click the **Search** button.



NOTE Optionally, you can click the **Use Advanced Search Options** link near the lower right corner of the application window to enable additional, more powerful search options. (If this link says **Use Basic Search Options** instead, the advanced options are already enabled.) For details, see Adobe Reader's online help.

Chapter 1

IMS Services and Database Navigation

The IMS Option extends StarTool FDM's online browsing and editing capabilities to IMS hierarchical databases. Both DL/1 and BMP processing environments are supported. Viewing, update, insertion, and deletion capabilities are provided for unique-keyed segments, nonunique-keyed segments, and non-keyed segments.

The following database structures and access methods are supported:

- Basic direct and sequential access methods — HDAM, PHDAM, HIDAM, PHIDAM, HSAM, and HISAM
- Fast Path access methods — DEDB (MSDB is not supported)
- High Availability Large Databases (HALDB) — all currently active partitions
- Secondary indexes (partitioned secondary indexes are not supported)
- Logical databases and logical children (both unidirectional and bidirectional)



NOTE GSAM, SHSAM, and SHISAM datasets are special-purpose sequential files used by IMS for logs. These can be accessed by StarTool FDM without the IMS Option.

Menu of IMS Services

All IMS services are accessible from one ISPF menu. Select the **IM** option from the **StarTool FDM Primary Options** menu to display the **Menu of IMS Services**.

```
PDSMIMS----- StarTool Menu of IMS Services -----
1 - IMSALLOC - Prompt for IMS libraries and PSB Member List for DL1
2 - IMSBMP   - Prompt for IMS libraries and PSB Member List for BMP
3 - MEMLIST  - Display PSB MEMLIST if active           Inactive
4 - IMSPCB   - Display current PCB LIST if active      Inactive
5 - EDIT/VIEW - Return to EDIT/VIEW if it is active   Inactive
6 - GO       - GO to the session with IMS if it is active Inactive
7 - LOAD     - Build LOAD IMS job
8 - CONVERT  - Build job to Convert DBD source to PSB source
9 - DLIDOPT  - Access DL1 data by Dynamic PSB(DBD)
10 - BMPDOPT - Access BMP data by Dynamic PSB(DBD)

Note: The PCB LIST can only be selected from the PSB Member list
      If MEMLIST is Current then option 3 will prompt for more members.

IMS is not active
Options 3 to 6 are not available
```



NOTE If you see the message “IMS is not active” at the bottom of the **Menu of IMS Services**, you have not yet allocated your default IMS libraries. Options **3** through **6** are not active until these libraries are allocated and the StarBat Option connects to IMS. Use one of the allocation and editing options (Options **1**, **2**, **9**, or **10**) to allocate a working set of IMS libraries.

Functionally, the **Menu of IMS Services** can be divided into the following option groups:

- [Library Allocation and Editing Options](#)
- [IMS Utility Options](#)
- [Session Navigation Shortcuts](#)

Library Allocation and Editing Options

■ **1 - IMSALLOC**

IMS library allocation for DL/1 processing with *static* PSBs. Prompts for the IMS libraries to allocate, populates a MEMLIST with the associated PSBs, and lets you drill down to the PCBs for the segments to be browsed or edited. Select the desired PCBs and invoke the PEDIT or PVIEW editor from the PCB list.

■ **2 - IMSBMP**

IMS library allocation for BMP processing with *static* PSBs. Prompts for the IMS libraries to allocate, populates a MEMLIST with the associated PSBs, and lets you drill down to the PCBs for the segments to be browsed or edited. Select the desired PCBs and invoke the PEDIT or PVIEW editor from the PCB list.

■ **9 - DLIDOPT**

IMS library allocation for DL/1 processing with the *dynamic* PSB option (DOPT). StarTool FDM generates a PSB dynamically from the appropriate DBD if a PSB is not available for the desired IMS database or segment. The StarBat Option prompts you for the IMS libraries to allocate and the assembler and link editor you wish to use for PSB generation. It then populates a MEMLIST with the DBDs associated with the IMS libraries, generates a PSB from the DBD you select, generates one or more PSBs from the DBD you select, displays a PSB list, and lets you drill down to the PCBs for the segments to be browsed or edited. Select the desired PCBs and invoke the PEDIT or PVIEW editor from the PCB list.

■ **10 - BMPDOPT**

IMS library allocation for BMP processing with the *dynamic* PSB option (DOPT). StarTool FDM generates a PSB dynamically from the appropriate DBD if a PSB is not available for the desired IMS database or segment. The StarBat Option prompts you for the IMS libraries to allocate and the assembler and link editor you wish to use for PSB generation. It then populates a MEMLIST with the DBDs associated with the IMS libraries, generates one or more PSBs from the DBD you select, displays a PSB list, and lets you drill down to the PCBs for the segments to be browsed or edited. Select the desired PCBs and invoke the PEDIT or PVIEW editor from the PCB list.

IMS Utility Options

■ 7 - LOAD

Generates the code needed to perform the initial load of an IMS database with content. The source data may be an IMS database or segments extracted from an IMS database using the Extract command. The generated LOAD job may be executed at any time.

■ 8 - CONVERT

Generates the code to create a PSB from a selected DBD. When you run the generated job, the generated PSB is stored in the current PSBLIB and ACBGEN is run to create the appropriate runtime member in the current ACBLIB. Multiple PSBs may be generated from multiple DBDs in a single batch job using this option.

Session Navigation Shortcuts

■ 3 - MEMLIST

Displays the most recently populated PSB MEMLIST. You must first allocate the relevant IMS libraries before this option becomes available. Use an allocation and editing option (options **1**, **2**, **9**, or **10**) from the **Menu of IMS Services** to allocate these libraries. The status description to the right of this options change from *Inactive* to *Active*.

■ 4 - IMSPCB

Displays the most recently populated PCB MEMLIST. You must first allocate the relevant IMS libraries before this option becomes available. Use an allocation and editing option (options **1**, **2**, **9**, or **10**) from the **Menu of IMS Services** to allocate these libraries. The status description to the right of this option changes from *Inactive* to *Active*.

■ 5 - EDIT/VIEW

Displays the currently active PEDIT or PVIEW session while keeping the current MEMLISTs active. You must first invoke the editor with the E (for Edit) or V (for View) command at the **Command ==>** prompt of the **PCB Member List** panel before this option becomes available. The status description to the right of this option changes from *Inactive* to *Active* when an editing session is open.

■ 6 - GO

If multiple StarTool FDM "GO sessions" are active and one of them is the StarBat Option, this option takes you to that session. After you select this option, the status description to the right of the option changes from *Active* to *Current*.

Library Allocation

Before you can work with segments in an IMS database, the following libraries must be allocated:

- PSBLIB — IMS library containing PSB (Program Specification Block) members
- DBDLIB — IMS library containing DBD (Database Description) members

- RESLIB — IMS resident executable library
- STEPLIB — optional STEPLIB for IMS execution
- PARMLIB — StarTool FDM parameter library containing predefined parameter lists
- DFSVSAMP member (in PARMLIB) — IMS Option VSAM parameter list member
- MACLIB — IMS macro library; required for dynamic PSB allocation (options **9** and **10**)
- IMSLOG — IMS log library

All allocation and editing options — that is, Options **1**, **2**, **9**, and **10** on the **Menu of IMS Services** — prompt you to allocate the necessary libraries. Default allocations are shown in these panels if any of the following conditions apply:

- If you have customized your IMS allocations by CLIST or set up a default allocation in the PDS#OPT4 options member for StarTool FDM, those defaults appear on the prompt panels. CLIST allocation takes priority over PDS#OPT4 allocation if both exist.
- New library allocation entries override any defaults that appear on the panel.
- If library allocations were explicitly entered in these panels by the current user in a previous session and the **Retain Databases ==>** field was set to YES, that previous allocation is retained for the user and displayed automatically in the next session.

See [Appendix A, "Installing and Configuring the IMS Option"](#), for information on customizing IMS library allocation defaults.

Navigating IMS Databases

Segment Selection

The IMS Option allows you to navigate one or more IMS databases concurrently using StarTool FDM MEMLISTs for PSB, PCB, and individual segment selection. Segments are selectable by segment name and content. Once the desired segments are found, the StarTool FDM editor is invoked to view or edit each segment.

MEMLIST-Driven Navigation

MEMLIST-driven navigation of an IMS database works essentially the same way for both DL/1 and BMP. In both IMS environments, you can use either previously defined PSBs or, if a PSB is not available, you can request that the IMS Option generate a PSB dynamically from an existing DBD.

High Availability Large Databases

HALDBs (High Availability Large Databases) are navigated like any other IMS database from a user standpoint. However, only the currently active HALDB partitions are accessible. If you attempt to access a specific segment in an offline partition, an error message displays. If you browse through segments sequentially and the next logical segment in the sequence resides in an offline partition, the IMS Option skips the offline partition and proceeds to the next available segment in an online partition.

This chapter describes MEMLIST-driven navigation through an IMS database in multisegment mode. The following topics are discussed:

- [Navigation Using Predefined PSBs](#)
- [Navigation Using Dynamic PSBs](#)
- [Working with PCB MEMLISTs](#)

Navigation in single-segment mode is discussed in [Chapter 3, "Single Segment Interface \(SSI\)"](#).

Navigation Using Predefined PSBs

The **Menu of IMS Services** displays two options that allocate IMS libraries, populate a MEMLIST with selectable, predefined PSBs, and enable MEMLIST-driven navigation to the associated IMS segments for browsing or editing. Those options are:

- 1 - IMSALLOC** for DL/1 databases
- 2 - IMSBMP** for BMP databases

Select the appropriate option and press Enter. One of three possible runtime library allocation prompt screen displays:

- [IMS Authorization and Allocation Prompt](#)
- [DL/1 Dataset Allocation Prompt](#)
- [BMP Dataset Allocation Prompt](#)

The actual screens displayed and the information required depend on how you configure library allocation during IMS Option setup.

After library allocation, you will perform the following task:

- [Predefined PSB Selection](#)

IMS navigation using predefined (or static) PSBs then converges with that for dynamic PSBs. MEMLIST-driven navigation allows you to drill down from PSBs to PCBs to segments to fields in order to select and filter the segments you will view or edit.

IMS Authorization and Allocation Prompt

If your installation implements the PDSIMSEX user exit, the following **IMS Authorization and Allocation Prompt** panel displays for both Option **1** (DL/1 databases) and Option **2** (BMP databases).

```
----- StarTool IMS authorization and allocation prompt -----
OPTION ==>

IMS subsystem name ==> IMS1      (Name used by installation exit)
Desired Access      ==> UPDATE   (READ or UPDATE)
Single Access Mode  ==> N        (Y/N; Y for Single Segment Access Interface)
Retain Databases    ==> NO       (Yes/No. Yes will cause preallocated data
                                   bases not to be freed at the end of each
                                   EDIT or VIEW session. For dynamically
                                   allocated databases, use NO.)
```

This allocation prompt panel does not require library names to be supplied by the user. Instead, libraries are allocated by the exit. The user supplies the following information:

IMS Subsystem	Name of the IMS subsystem or control region you want to use for IMS database management. Exit PDSIMSEX allocates the IMS system datasets required by the control region.
----------------------	--

Desired Access	<ul style="list-style-type: none"> ■ READ – Read-only access. Access will be further qualified by the selected PSBs and PCBs. ■ UPDATE – Update access. Access will be further qualified by the selected PSBs and PCBs. <p>If a selected PCB does not allow updates to the desired field, updates will not be permitted to that field, regardless of the access level chosen here.</p>
Single Access Mode	<ul style="list-style-type: none"> ■ N – No, do not use SSI mode (default). For regular IMS database navigation as discussed here, choose N. ■ Y – Yes, invoke the SSI interface discussed in Chapter 3, "Single Segment Interface (SSI)". Not used for regular IMS database navigation.
Retain Databases	<ul style="list-style-type: none"> ■ NO – Datasets are automatically deallocated on exit from the editor (default). Recommended for normal use. ■ YES – Dataset allocations are retained on exit from the editor. You will be prompted for an IMS allocation CLIST when you invoke the editor. <p>If you choose YES for this option, IMS datasets must be deallocated manually. If not deallocated, dataset enqueues last as long as you are logged on.</p>

Type the requested information and press Enter. The **PSB MEMBER Prompt** panel displays. Then proceed to "[Predefined PSB Selection](#)" later in this chapter.

DL/1 Dataset Allocation Prompt

If your installation does not implement the PDSIMSEX user exit and you select Option **1-IMSALLOC** from the **Menu of IMS Services**, the **DL/1 Dataset Allocation** panel displays.

```

----- StarTool IMS DLI Dataset Allocation prompt -----
OPTION ==>

Desired Access ==> UPDATE (READ or UPDATE)
Single Access Mode ==> N (Y/N; Y for Single Segment Access Interface)
Retain Data Bases ==> NO (Yes/No, Yes will cause preallocated data
bases not to be freed at the end of each
EDIT or VIEW session. For dynamically
allocated data bases use NO.

Log alloc CLIST ==> IMSLOGAL (Name of CLIST to allocate IMS Log data set)

Allocation CLIST ==> IMSALLOC (Name of CLIST to allocate IMS data sets)
or
If not using an allocation CLIST, enter the required data set names:
PSB library ==> 'IMS.PSBLIB' IMS DD
DBD library ==> 'IMS.DBDLIB' IMS DD
RES library ==> 'IMS.RESLIB' DFSRESLB
STEPLIB lib ==> 'IMS.STEPLIB' IMSTASK
Parameter lib ==> 'IMS.PARMLIB' DFSVSAMP
DFSVSAMP Member ==> DFSVSMDB (Member in parameter library for vsam parms)

```

Enter the following information:

Desired Access	<ul style="list-style-type: none"> ■ READ– Read-only access. Access will be further qualified by the selected PSBs and PCBs. ■ UPDATE– Update access. Access will be further qualified by the selected PSBs and PCBs. <p>If a selected PCB does not allow updates to the desired field in a segment, updates will not be permitted to that field, regardless of the access level chosen here.</p>
Single Access Mode	<ul style="list-style-type: none"> ■ N– No, do not use SSI mode (default). For regular IMS database navigation as discussed here, choose N. ■ Y– Yes, invoke the SSI interface discussed in Chapter 3, "Single Segment Interface (SSI)". Not used for regular IMS database navigation.
Retain Databases	<ul style="list-style-type: none"> ■ NO– Datasets are automatically deallocated when you exit the editor (default). Recommended for normal use. ■ YES– Dataset allocations are retained when you exit the editor. You will be prompted for an IMS allocation CLIST at the Segment Selection Criteria panel when you invoke the editor. <p>If you choose YES for this option, IMS datasets must be deallocated manually. If not deallocated, dataset enqueues last as long as you are logged on.</p>

If this is your first allocation of IMS libraries, the remaining fields on the panel are blank. However, if you have previously allocated IMS libraries, the most recently allocated libraries and allocation CLISTs display as default values on the panel.

Choose the IMS libraries to allocate by doing one of the following:

- **Accept the default libraries** and/or CLISTs as displayed and press Enter.
- **Type the names of your allocation CLISTs** or REXX EXECs, clear any individual library and member names, and press Enter. For example:

```

----- StarTool IMS DLI Dataset Allocation prompt -----
OPTION ==>
Desired Access ==> UPDATE (READ or UPDATE)
Single Access Mode ==> N (Y/N; Y for Single Segment Access Interface)
Retain Data Bases ==> NO (Yes/No, Yes will cause preallocated data
bases not to be freed at the end of each
EDIT or VIEW session. For dynamically
allocated data bases use NO.

Log alloc CLIST ==> IMSLOGAL (Name of CLIST to allocate IMS Log data set)
Allocation CLIST ==> IMSALLOC (Name of CLIST to allocate IMS data sets)
or
If not using an allocation CLIST, enter the required data set names:
PSB library ==> IMS DD
DBD library ==> IMS DD
RES library ==> DFSRESLB
STEPLIB lib ==> IMSTASK
Parameter lib ==> DFSVSAMP
DFSVSAMP Member ==> Member in parameter library for vsam parms)

Note: The Steplib is optional and usually contains "dyna-block" members but
may have other "override" load module members.

```

For this method, the following fields are required:

Log Alloc CLIST	Name of the DL/1 log allocation CLIST you created during IMS Option installation or setup. Use a customized version of IMSLOGAL, the DL/1 log allocation sample member.
Allocation CLIST	Name of the DL/1 IMS library allocation CLIST you created during installation or setup. Use a customized version of IMSALLOC, the DL/1 IMS library allocation sample member.

- **Type the names of the individual IMS libraries and members to allocate**, type the name of your IMS log allocation CLIST or REXX EXEC, clear the name of any IMS library allocation CLIST or REXX EXEC, and press Enter. For example:

```

----- StarTool IMS DLI Dataset Allocation prompt -----

OPTION ==>

Desired Access ==> UPDATE (READ or UPDATE)
Single Access Mode ==> N (Y/N; Y for Single Segment Access Interface)
Retain Data Bases ==> NO (Yes/No, Yes will cause preallocated data
bases not to be freed at the end of each
EDIT or VIEW session. For dynamically
allocated data bases use NO.

Log alloc CLIST ==> IMSLOGAL (Name of CLIST to allocate IMS Log data set)
Allocation CLIST ==> (Name of CLIST to allocate IMS data sets)
or
If not using an allocation CLIST, enter the required data set names:
PSB library ==> 'IMS.PSBLIB' IMS DD
DBD library ==> 'IMS.DBDLIB' IMS DD
RES library ==> 'IMS.RESLIB' DFSRESLB
STEPLIB lib ==> 'IMS.STEPLIB' IMSTASK
Parameter lib ==> 'IMS.PARMLIB' DFSVSAMP
DFSVSAMP Member ==> DFSVSMDB (Member in parameter library for vsam parms)

Note: The Steplib is optional and usually contains "dyna-block" members but
may have other "override" load module members.
    
```

For this method, the following fields are required unless otherwise stated:

Log Alloc CLIST	Member name of the DL/1 log allocation CLIST you created during IMS Option installation or setup. Use a customized version of IMSLOGAL, the DL/1 log allocation sample member. Do not use any quotes in this field.
PSB Library	DSN of the IMS PSB library for the database of interest, delimited by single quotes.
DBD Library	DSN of the IMS DBD library for the database of interest, delimited by single quotes.
RES Library	DSN of the IMS RES library for the database of interest, delimited by single quotes.
STEPLIB Library	DSN of the STEPLIB library containing IMS "dynablock" members or other override load modules used with IMS at your installation, delimited by single quotes. Optional.
Parameter Library	DSN of the library containing PDS#OPT4 and other customized StarTool FDM parameter members, delimited by single quotes.

DFSVSAMP Member	Name of the member in the StarTool FDM parameter library that specifies VSAM parameters. The usual value is DFSVSAMP. Do not use any quotes in this field.
------------------------	--

All three methods of choosing the IMS libraries to allocate take you to the same place: the **PSB MEMBER Prompt** panel. Proceed to ["Predefined PSB Selection"](#) later in this chapter.

BMP Dataset Allocation Prompt

If your installation does not implement the PDSIMSEX user exit and you select Option **2-IMSBMP** from the **Menu of IMS Services**, the following **BMP Dataset Allocation** panel displays.

```
----- StarTool IMS BMP Data Set Allocation prompt -----
OPTION ==>

IMS subsystem name ==> IMS1      (3-4 character IMS control region name)
Desired Access      ==> UPDATE  (READ or UPDATE)
Single Access Mode  ==> N       (Y/N; Y for Single Segment Access Interface)

Allocation CLIST    ==> IMSBMPAL (Name of CLIST to allocate IMS data sets)
or
Manual allocation of IMS data sets:
  PSB library       ==> 'IMS.PSBLIB'           IMS DD
  DBD library       ==> 'IMS.DBDLIB'         IMS DD
  RES library       ==> 'IMS.RESLIB'        DFSRESLB
```

Enter the following information:

IMS Subsystem	Name of the IMS subsystem or control region you want to use for IMS database transaction management.
Desired Access	<ul style="list-style-type: none"> ■ READ- Read-only access. Access will be further qualified by the selected PSBs and PCBs. ■ UPDATE- Update access. Access will be further qualified by the selected PSBs and PCBs. <p>If a selected PCB does not allow updates to the desired field in a segment, updates will not be permitted to that field, regardless of the access level chosen here.</p>
Single Access Mode	<ul style="list-style-type: none"> ■ N- No, do not use SSI mode (default). For regular IMS database navigation as discussed here, choose N. ■ Y- Yes, invoke the SSI interface discussed in Chapter 3, "Single Segment Interface (SSI)". Not used for regular IMS database navigation.

If this is your first allocation of IMS libraries, the remaining fields on the panel are blank. However, if you have previously allocated IMS libraries, the most recently allocated libraries and allocation CLISTs display as default values on the panel.

Choose the IMS libraries to allocate by doing one of the following:

- **Accept the default libraries** and/or CLIST as displayed and press Enter.
- **Type the name of your allocation CLIST** or REXX EXEC, clear any individual library names, and press Enter. For example:

```
----- StarTool IMS BMP Data Set Allocation prompt -----
OPTION ===>

IMS subsystem name ===> IMS1      (3-4 character IMS control region name)
Desired Access      ===> UPDATE   (READ or UPDATE)
Single Access Mode  ===> N        (Y/N; Y for Single Segment Access Interface)

Allocation CLIST    ===> IMSBMPAL (Name of CLIST to allocate IMS data sets)
or
Manual allocation of IMS data sets:
  PSB library       ===>                               IMS DD
  DBD library       ===>                               IMS DD
  RES library       ===>                               DFSRESLB
```

For this method, the following field is required:

Allocation CLIST	Name of the BMP IMS library allocation CLIST you created during installation or setup. Use a customized version of the IMSBMPAL sample member. Do not type quotes.
------------------	--

- **Type the names of the individual IMS libraries to allocate**, clear the name of any IMS library allocation CLIST or REXX EXEC, and press Enter. For example:

```
----- StarTool IMS BMP Data Set Allocation prompt -----
OPTION ===>

IMS subsystem name ===> IMS1      (3-4 character IMS control region name)
Desired Access      ===> UPDATE   (READ or UPDATE)
Single Access Mode  ===> N        (Y/N; Y for Single Segment Access Interface)

Allocation CLIST    ===>          (Name of CLIST to allocate IMS data sets)
or
Manual allocation of IMS data sets:
  PSB library       ===> 'IMS.PSBLIB'                    IMS DD
  DBD library       ===> 'IMS.DBDLIB'                    IMS DD
  RES library       ===> 'IMS.RESLIB'                    DFSRESLB
```

For this method, the following fields are required:

PSB Library	DSN of the IMS PSB library for the database of interest, delimited by single quotes.
DBD Library	DSN of the IMS DBD library for the database of interest, delimited by single quotes.
RES Library	DSN of the IMS RES library for the database of interest, delimited by single quotes.

All three methods of choosing the IMS libraries to allocate take you to the same place: the **PSB MEMBER Prompt** panel. Proceed to ["Predefined PSB Selection"](#), below.

Predefined PSB Selection

After your runtime libraries are allocated, the **PSB Member Prompt** panel displays. This panel lets you filter the predefined PSBs in the allocated IMS PSBLIB by name or date attributes before including them in a PSB MEMLIST. For example:

```
----- StarTool IMS PSB member prompt -----
OPTION ==>

Enter member name or group for PSB list
  MEMBERS ==> AGEM*           (set to * or a member group for MEMLIST)

Alternate selections for creating a MEMLIST:
Member selection ==> (choose any of the following member filters)
  1 - All members updated today
  2 - All members updated since yesterday
  3 - All members updated in the last week
  4 - All members updated in the last month
  5 - All members updated in the last year

If a member group is specified, a general purpose MEMLIST will be built.
The member list S line command will be set to PSB
```

Enter the following information:

Members	<p>Type a member name or member group parameter value suitable for the StarTool FDM ML command. This may be a single PSB member name or a pattern such as the following:</p> <ul style="list-style-type: none"> * - Currently active member group = - All members in the current MEMLIST : AA* - Members names beginning with AA AA*B - Member names that start with AA and end in B, with at least one character between AA_B - Member names that start with AA and end in B, with zero or more characters between AA/ - Member names containing AA anywhere A?A - Member names of the form AaA, where <i>a</i> is any one character
Members (continued)	<p>See the appendix on formatting member names in the <i>StarTool FDM Command Reference</i> for a full description of member name and group patterns.</p> <p>If you type a value in this field, leave the Member Selection field blank.</p>
Member Selection	<p>Type a filter option from the list to filter PSBs by the date attribute described on the panel. Accepted values are 1 to 5.</p> <p>If you type a value in this field, leave the Members field blank.</p>

Navigation Using Dynamic PSBs

The **Menu of IMS Services** displays two options that allocate IMS libraries, populate a MEMLIST with selectable DBDs, dynamically generate PSBs from one or more selected DBDs, optionally allow online editing of generated PSBs, and enable MEMLIST-driven navigation to the associated IMS segments for browsing or editing. Those options are:

9 - DL1DOPT for DL/1 databases

10 - BMPDOPT for BMP databases

Select the appropriate option and press Enter. One of three possible runtime library allocation prompt sequences displays:

- [Exit-Controlled Dynamic Library Allocation](#)
- [DL/1 Dynamic Library Allocation](#)
- [BMP Dynamic Library Allocation](#)

The actual screens displayed and the information required depend on how you configure library allocation during IMS Option setup.

After library allocation, you will perform the following tasks:

- [DBD Selection for Dynamic PSB Generation](#)
- [Dynamic PSB Generation and Editing](#)

IMS navigation using dynamic PSBs then converges with that for predefined (or static) PSBs. MEMLIST-driven navigation allows you to drill down from PSBs to PCBs to segments to fields in order to select and filter the segments you will view or edit.

Exit-Controlled Dynamic Library Allocation

If your installation implements the PDSIMSEX user exit, the following **IMS Authorization and Allocation Prompt** panel displays for both Option **9** (DL/1 databases) and Option **10** (BMP databases). For example:.

```
----- StarTool IMS authorization and allocation prompt -----
OPTION ==>

IMS subsystem name ==> IMS1      (Name used by installation exit)
Desired Access      ==> UPDATE  (READ or UPDATE)
Single Access Mode  ==> N       (Y/N; Y for Single Segment Access Interface)
Retain Databases    ==> NO      (Yes/No. Yes will cause preallocated data
                                bases not to be freed at the end of each
                                EDIT or VIEW session. For dynamically
                                allocated databases, use NO.)
```

This allocation prompt panel does not require library names to be supplied by the user. Instead, libraries are allocated by the exit. In addition, unlike other dynamic PSB screen sequences, this panel prevents the user from editing generated PSBs prior to use.

Supply the following information:

IMS Subsystem	Name of the IMS subsystem or control region you want to use for IMS database management. Exit PDSIMSEX allocates the IMS system datasets (PSBLIB, DBDLIB, RESLIB, logs) required by the named control region.
Desired Access	<ul style="list-style-type: none"> ■ READ- PSBs will be generated for read-only access. ■ UPDATE- PSBs will be generated for update access. <p>If a selected PCB does not allow updates to the desired field in a segment, updates will not be permitted to that field, regardless of the access level chosen here.</p>
Single Access Mode	<ul style="list-style-type: none"> ■ N- No, do not use SSI mode (default). For regular IMS database navigation as discussed here, choose N. ■ Y- Yes, invoke the SSI interface discussed in Chapter 3, "Single Segment Interface (SSI)". Not used for regular IMS database navigation.
Retain Databases	<ul style="list-style-type: none"> ■ NO- Datasets are automatically deallocated when you exit the editor (default). Recommended for normal use. ■ YES- Dataset allocations are retained when you exit the editor. You will be prompted for an IMS allocation CLIST when you invoke the editor. <p>If you choose YES for this option, IMS datasets must be deallocated manually. If not deallocated, dataset enqueues last as long as you are logged on.</p>

Type the requested information and press Enter. The **DBD MEMBER Prompt** panel displays. Proceed to ["DBD Selection for Dynamic PSB Generation"](#) later in this chapter.

DL/1 Dynamic Library Allocation

If your installation does not implement the PDSIMSEX user exit and you select Option **9-DL1DOPT** from the **Menu of IMS Services**, the **DL1 DOPT Dataset Specification** panel is the first allocation screen to display. For example:

```

----- StarTool IMS DLI DOPT Dataset Specification prompt -----
OPTION ===>

IMS MACRO library name   ===> IMS.MACLIB

Name for assembler      ===> ASMA90   (used for PSB)
Name for linkage editor  ===> HEWL     (used for PSB)
EDIT PSB before assembly ===> YES     (Yes or No)

Sysout class for PSB output ===> H
    
```

Supply the following information:

Macro Library	The name of the IMS macro library to allocate.
Assembler	Name of the assembler to use during dynamic PSB generation.
Linkage Editor	Name of the linkage editor to use during dynamic PSB generation.

Edit PSB Before Assembly	<ul style="list-style-type: none"> ■ YES—Allow user edits to the dynamically generated PSB online prior to use. Use this option to add or remove indexes or to change segment selections. ■ NO—Do not edit the generated PSB prior to use.
SYSOUT Class	A valid JES output class must be supplied for dynamic PSB generation. Do not type an asterisk in this field.

Press Enter. The **DL/1 Data Set Allocation** panel displays.

```

----- StarTool IMS DLI Dataset Allocation prompt -----
OPTION ==>

Desired Access ==> UPDATE (READ or UPDATE)
Single Access Mode ==> N (Y/N; Y for Single Segment Access Interface)
Retain Data Bases ==> NO (Yes/No, Yes will cause preallocated data
bases not to be freed at the end of each
EDIT or VIEW session. For dynamically
allocated data bases use NO.

Log alloc CLIST ==> IMSLOGAL (Name of CLIST to allocate IMS Log data set)

Allocation CLIST ==> IMSALLOC (Name of CLIST to allocate IMS data sets)
or
If not using an allocation CLIST, enter the required data set names:
PSB library ==> 'IMS.PSBLIB' IMS DD
DBD library ==> 'IMS.DBDLIB' IMS DD
RES library ==> 'IMS.RESLIB' DFSRESLB
STEPLIB lib ==> 'IMS.STEPLIB' IMSTASK
Parameter lib ==> 'IMS.PARMLIB' DFSVSAMP
DFSVSAMP Member ==> DFSVSMDB (Member in parameter library for vsam parms)
    
```

Enter the following information:

Desired Access	<ul style="list-style-type: none"> ■ READ— PSBs will be generated for read-only access. ■ UPDATE— PSBs will be generated for update access. <p>If a selected PCB does not allow updates to the desired field in a segment, updates will not be permitted to that field, regardless of the access level chosen here.</p>
Single Access Mode	<ul style="list-style-type: none"> ■ N— No, do not use SSI mode (default). For regular IMS database navigation as discussed here, choose N. ■ Y— Yes, invoke the SSI interface discussed in Chapter 3, "Single Segment Interface (SSI)". Not used for regular IMS database navigation.
Retain Databases	<ul style="list-style-type: none"> ■ NO— Datasets are automatically deallocated when you exit the editor (default). Recommended for normal use. ■ YES— Dataset allocations are retained when you exit the editor. You will be prompted for an allocation CLIST at the Segment Selection Criteria panel when you invoke the editor. <p>If you chose YES, IMS datasets must be deallocated manually. If not deallocated, dataset enqueues last as long as you are logged on.</p>

If this is your first allocation of IMS libraries, the remaining fields on the panel are blank. However, if you have previously allocated IMS libraries, the most recently allocated libraries and allocation CLISTs display as default values on the panel.

Choose the remaining IMS libraries to allocate by doing one of the following:

- **Accept the default libraries** and/or CLISTs as displayed and press Enter.
- **Type the names of your allocation CLISTs** or REXX EXECs, clear any individual library and member names, and press Enter. For this method, the following fields are required:

Log Alloc CLIST	Name of the DL/1 log allocation CLIST you created during IMS Option installation or setup. Use a customized version of IMSLOGAL, the DL/1 log allocation sample member.
Allocation CLIST	Name of the DL/1 IMS library allocation CLIST you created during installation or setup. Use a customized version of IMSALLOC, the DL/1 IMS library allocation sample member.

- **Type the names of the individual IMS libraries and members to allocate**, type the name of your IMS log allocation CLIST or REXX EXEC, clear the name of any IMS library allocation CLIST or REXX EXEC, and press Enter. For this method, the following fields are required unless otherwise stated:

Log Alloc CLIST	DSN of the DL/1 log allocation CLIST you created during IMS Option installation or setup. Use a customized version of IMSLOGAL, the DL/1 log allocation sample member. Do not use any quotes in this field.
PSB Library	DSN of the IMS PSB library for the database of interest, delimited by single quotes.
DBD Library	DSN of the IMS DBD library for the database of interest, delimited by single quotes.
RES Library	DSN of the IMS RES library for the database of interest, delimited by single quotes.
STEPLIB Library	DSN of the STEPLIB library containing IMS "dynablock" members or other override load modules used with IMS at your installation, delimited by single quotes. Optional.
Parameter Library	DSN of the library containing PDS#OPT4 and other customized StarTool FDM parameter members, delimited by single quotes.
DFSVSAMP Member	Name of the member in the StarTool FDM parameter library that specifies VSAM parameters. The usual value is DFSVSAMP. Do not use any quotes in this field.

All three methods of allocating IMS libraries take you to the same place: the **DBD MEMBER Prompt** panel. See "[DBD Selection for Dynamic PSB Generation](#)" later in this chapter.

BMP Dynamic Library Allocation

If your installation does not implement the PDSIMSEX user exit and you select Option **10-BMPDOPT** from the **Menu of IMS Services**, the **BMP DOPT Dataset Specification** panel is the first allocation screen to display.

```
----- StarTool IMS BMP DOPT Dataset Specification prompt -----
OPTION ==>

IMS MACRO library name ==> IMS.MACLIB
IMS ACB library name   ==> IMS.ACBLIB

Name for assembler      ==> ASMA90   (used for PSB/ACB)
Name for linkage editor ==> HEWL     (used for PSB/ACB)
EDIT PSB before assembly ==> YES    (Yes or No)

Sysout class for PSB/ACB output ==> H
```

Supply the following information:

Macro Library	The name of the IMS macro library to allocate.
ACB Library	The name of the IMS ACB library to allocate for dynamic PSB generation.
Assembler	Name of the assembler to use during dynamic PSB generation.
Linkage Editor	Name of the linkage editor to use during dynamic PSB generation.
Edit PSB Before Assembly	<ul style="list-style-type: none"> ■ YES—Allow user edits to the dynamically generated PSB online prior to use. Use this option to add or remove indexes or to change segment selections. ■ NO—Do not edit the generated PSB prior to use.
SYSOUT Class	A valid JES output class must be supplied for dynamic PSB generation. Do not type an asterisk in this field.

Press Enter. The **BMP Dataset Allocation** panel displays.

```
----- StarTool IMS BMP Data Set Allocation prompt -----

OPTION ==>

IMS subsystem name ==> IMS1      (3-4 character IMS control region name)
Desired Access     ==> UPDATE    (READ or UPDATE)
Single Access Mode ==> N        (Y/N; Y for Single Segment Access Interface)

Allocation CLIST   ==> IMSBMPAL (Name of CLIST to allocate IMS data sets)
or
Manual allocation of IMS data sets:
PSB library       ==> 'IMS.PSBLIB'           IMS DD
DBD library       ==> 'IMS.DBDLIB'          IMS DD
RES library       ==> 'IMS.RESLIB'         DFSRESLB
```

Enter the following information:

IMS Subsystem	Name of the IMS subsystem or control region you want to use for IMS database transaction management.
Desired Access	<ul style="list-style-type: none"> ■ READ- PSBs will be generated for read-only access. ■ UPDATE- PSBs will be generated for update access. <p>If a selected PCB does not allow updates to the desired field in a segment, updates will not be permitted to that field, regardless of the access level chosen here.</p>
Single Access Mode	<ul style="list-style-type: none"> ■ N- No, do not use SSI mode (default). For regular IMS database navigation as discussed here, choose N. ■ Y- Yes, invoke the SSI interface discussed in Chapter 3, "Single Segment Interface (SSI)". Not used for regular IMS database navigation.

If this is your first allocation of IMS libraries, the remaining fields on the panel are blank. However, if you have previously allocated IMS libraries, the most recently allocated libraries and allocation CLISTs display as default values on the panel.

Choose the IMS libraries to allocate by doing one of the following:

- **Accept the default libraries** and/or CLIST as displayed and press Enter.
- **Type the name of your allocation CLIST** or REXX EXEC, clear any individual library names, and press Enter. For this method, the following field is required:

Allocation CLIST	Name of the BMP IMS library allocation CLIST you created during installation or setup. Use a customized version of the IMSBMPAL sample member. Do not type quotes.
-------------------------	--

- **Type the names of the individual IMS libraries to allocate**, clear the name of any IMS library allocation CLIST or REXX EXEC, and press Enter. For this method, the following fields are required:

PSB Library	DSN of the IMS PSB library for the database of interest, delimited by single quotes.
DBD Library	DSN of the IMS DBD library for the database of interest, delimited by single quotes.
RES Library	DSN of the IMS RES library for the database of interest, delimited by single quotes.

All three methods of allocating IMS libraries take you to the same place: the **DBD MEMBER Prompt** panel. See "[DBD Selection for Dynamic PSB Generation](#)" below.

DBD Selection for Dynamic PSB Generation

After you select the IMS libraries to allocate at runtime, the **DBD Member Prompt** panel displays. You will select the DBD member to use for dynamic PSB generation.

```

----- StarTool IMS DBD member prompt ----- Row 1 to 6 of 6
OPTION ===>

Enter member name or group for DBD list
  MEMBERS ===> AGEM*          (set to * or a member group for MEMLIST)

Alternate selections for creating a MEMLIST:
Member selection ===> (choose any of the following member filters)
  1 - All members updated today
  2 - All members updated since yesterday
  3 - All members updated in the last week
  4 - All members updated in the last month
  5 - All members updated in the last year

If a member group is specified, a general purpose MEMLIST will be built.
The member list S line command will be set to PSB

```

Enter the following information:

<p>Members</p>	<p>Type a member name or member group parameter value suitable for the StarTool FDM ML command. This may be a single DBD member name or a pattern such as the following:</p> <ul style="list-style-type: none"> * - Currently active member group = - All members in the current MEMLIST : - All members in the current PSBLIB AA* - Members names beginning with AA AA*B - Member names that start with AA and end in B, with at least one character between AA_B - Member names that start with AA and end in B, with zero or more characters between AA/ - Member names containing AA anywhere A?A - Member names of the form AaA, where <i>a</i> is any one character <p>See the appendix on formatting member names in the <i>StarTool FDM Command Reference</i> for a full description of member name and group patterns.</p> <p>If you type a value in this field, leave the Member Selection field blank.</p>
<p>Member Selection</p>	<p>Type a filter option from the list to filter PSBs by the date attribute described on the panel. Accepted values are 1 to 5.</p> <p>If you type a value in this field, leave the Members field blank.</p>

When you press Enter, the IMS Option displays the **DBD MEMLIST** panel, which lists the DBDs in the allocated DBDLIB that meet your selection criteria.

```

----- DBD MEMLIST (Attributes), Session# 1 ----- Row 1 to 6 of 6
COMMAND ==> SCROLL ==> PAGE
Enter an ISPF command, a StarTool subcommand or a special control code:
- DSN=IMS.DBDLIB,VOL=SER=OS3P9B MEM=AGEM*-----
CMD  NAME      DATA/MSG ALIASOF  LEN/LKED  --  ATTRIBUTES  -  APF  MODE  MAIN
   AGEMDB14
S   AGEMDB15      2004/04/05
   AGEMDB18      2004/04/05
   AGEMLDB1      2004/04/05
   AGEMLDB2      2004/01/18
   AGEMSI14      2005/10/05
***** Bottom of data *****

-----
| TOTAL=          6 |
| ADDS =          6 |
-----

```

The standard StarTool FDM conventions for viewing MEMLISTs apply to the **DBD MEMLIST** panel. In the **CMD** column, you can enter the following line commands:

- M requests a menu of available line commands.
- S selects a DBD for processing.
- + requests an expanded command line for the DBD.

To deselect a DBD, type a blank over the S in the **OPT** column and press Enter.

You can also enter StarTool FDM or ISPF commands at the **Command ==>** prompt. Such commands apply to any DBDs explicitly selected on the panel, but no others.

To generate a PSB, select the desired DBD and press Enter. The desired PSB is generated dynamically from the DBD.



NOTE *If you select multiple DBDs concurrently* on the **DBD MEMLIST** panel, they will *not* be queued for consecutive processing. The IMS Option processes only the first DBD selected for dynamic PSB generation.

Dynamic PSB Generation and Editing

Dynamically generated PSBs are intended for one-time use by systems programmers performing data recovery or other specialized data management tasks.

When the IMS Option generates a PSB, it assigns a generated PSB name in the series SERENA01 to SERENA16 for update access and SERENG01 to SERENG16 for read-only access. The PSB defines a PCB of type DB with the PROCOPT parameter set to the level of access you specified at the dataset allocation prompt panel. After assembly and link-editing, the resulting load member is saved in the appropriate RESLIB or ACBLIB. To protect the design of your IMS database, however, the generated PSB source is never saved in the PSBLIB.

Dynamic PSB assembly proceeds as follows.

- If you entered YES in the **EDIT PSB before assembly ==>** field of the previous **DOPT Specification Prompt** panel, the IMS Option displays the generated PSB source code for editing in ISPF prior to assembly.

Displaying PCBs, Segments, and Fields in MEMLIST Mode

The **PCB List** panel displays all PCBs associated with a previously selected PSB. If multiple PSBs were selected, PCBs are displayed for only one PSB at a time. The associated PSB name appears in the title of the panel.

For example:

```

----- IMS PCB List for AGEMSDB ----- Row 1 to 3 of 3
COMMAND ==>                                SCROLL ==> CSR

Enter an EDIT, VIEW, BATCH EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
    PCB#001          DB      GEMSDB  AP   100    --
    PCB#002          DB      IVPDB1  A    10     --
    PCB#003          DB      HIDAMI01 GOT  100    -- INDEX DBD=SECIX02
***** Bottom of data *****

```

StarTool FDM conventions for viewing MEMLISTs apply with some modifications to the **PCB List** panel. In the **OPT** column, you can enter the following line commands:

- M requests a menu of available line commands.
- S selects a PCB for further processing. The SS block command is supported.
- DES deselects a PCB from the set of PCBs targeted for further processing.
- + expands the PCB to show the segments it defines without selecting it.
- - collapses an expanded PCB.

You can also enter StarTool FDM or ISPF commands at the **Command ==>** prompt. Such commands apply to any PCBs explicitly selected on the panel, but no others.

Column headings have the following meanings for PCBs:

NAME	If the PCB was assigned a name in the PSB, that name displays under the heading NAME in the PCB List panel. Otherwise, the IMS Option generates a PCB name of the form PCB# <i>nnn</i> , where <i>nnn</i> is the sequential number for each PCB definition in the PSB.
DATA/MSG	Displays a status message or a file processing error code after a line command or FDM subcommand is performed. If an error message appears, see "DATA/MSG Column Messages" in Appendix C, "Troubleshooting" .
TYP	<ul style="list-style-type: none"> ■ DB- Database PCB ■ TP- Teleprocessing PCB StarTool FDM works only with PCBs of type DB. Do not select a PCB of type TP.
SL	Selected status. If a PCB is currently selected for processing, S appears in this field. Only selected items are targeted by FDM subcommands, such as the Edit command, entered at the Command ==> prompt.
Location	Name of the DBD associated with the PCB.
ATTR	Processing attributes for the PCB.

Kyl	Maximum concatenated key length, in bytes, for the PCB.
Search Argument	For PCBs with a secondary index, the name of the index DBD displays here. Otherwise, this field is blank for PCBs.

If the PCBs in the **PCB List** do not have descriptive names, type the + command in the **OPT** column to expand each PCB's segment list for viewing. You can then identify the particular PCB of interest by the segments it defines.



NOTE Expanding a PCB with the + command does *not* select it for further processing or for drill-down navigation to actual segments and fields. You must type an S in the **OPT** column to select a PCB for further processing.

Once you have identified the desired PCB, type an S in the **OPT** column beside it to select it and press Enter. The **PCB List** panel marks the PCB as selected and expands its segment list for further drill-down and Segment Search Argument (SSA) specification.

```

----- IMS PCB List for AGEMSDB - ----- Row 1 to 15 of 15
COMMAND ==>                                SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
    PCB#001      DB  S  GEMSDB  AP   100   --
      GEM        SEG  LEV#  1  AP    20  120 --
      COLOUR     SEG  LEV#  2  AP    10   40 --
      STONE      SEG  LEV#  3  AP     3   80 --
      JEWELRY    SEG  LEV#  3  AP    10   20 --
      ITEM       SEG  LEV#  4  AP    10   70 --
      PARTS      SEG  LEV#  5  AP    10   35 --
      GENINFO    SEG  LEV#  2  AP     2   64 --
      SOURCES    SEG  LEV#  3  AP    20   20 --
      COLRINFO   SEG  LEV#  3  AP     2   50 --
      ALIASES    SEG  LEV#  3  AP    20   20 --
    PCB#002      DB  IVPDB1  A    10   --
    PCB#003      DB  HIDAMI01 GOT  100   --  INDEX DBD=SECIX02
***** Bottom of data *****

```

If the segment names in the expanded PCB don't sufficiently identify the segments you want to view or edit, type the + command in the **OPT** column to expand candidate segments and view their field specifications. You can then identify the particular segments of interest by their field names and attributes.

For example:

```

----- IMS PCB List for AGEMSDB - ----- Row 1 to 20 of 26
COMMAND ==>
SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME          Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
+    PCB#001        DB S  GEMSDB  AP  100  --
    GEM            SEG  LEV#  1  AP   20  120 --
      NAME        FLD          1  CHAR K,U   20 --
      GEM01       FLD          1  CHAR          1 --
      GEM02       FLD          1  CHAR          2 --
      GEM03       FLD          1  CHAR          3 --
      GEM04       FLD          1  CHAR          4 --
      GEM05       FLD          1  CHAR          5 --
      GEM06       FLD          1  CHAR          6 --
      GEM07       FLD          1  CHAR          7 --
      GEM08       FLD          1  CHAR          8 --
      GEM09       FLD          1  CHAR          9 --
      HARDNESS    FLD          21  CHAR          2 --
      COLOUR      SEG  LEV#  2  AP   10  40 --
      STONE       SEG  LEV#  3  AP    3  80 --
      JEWELRY     SEG  LEV#  3  AP   10  20 --
      ITEM        SEG  LEV#  4  AP   10  70 --
      PARTS       SEG  LEV#  5  AP   10  35 --
      GENINFO     SEG  LEV#  2  AP    2  64 --
      SOURCES     SEG  LEV#  3  AP   20  20 --

```

Scroll left (PF11) to view the segment tree in indented form:

```

----- IMS PCB List for AGEMSDB - ----- Row 1 to 20 of 26
COMMAND ==>
SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  Hierarchy and Name          Data/MSG TYPE SEL Location ATTR
+    PCB#001                      DB S  GEMSDB  AP
    GEM            .....          SEG      LEV#  1  AP
      .NAME        .....          FLD          1  CHAR
      .GEM01       .....          FLD          1  CHAR
      .GEM02       .....          FLD          1  CHAR
      .GEM03       .....          FLD          1  CHAR
      .GEM04       .....          FLD          1  CHAR
      .GEM05       .....          FLD          1  CHAR
      .GEM06       .....          FLD          1  CHAR
      .GEM07       .....          FLD          1  CHAR
      .GEM08       .....          FLD          1  CHAR
      .GEM09       .....          FLD          1  CHAR
      .HARDNESS    .....          FLD          21  CHAR
      .COLOUR      .....          SEG      LEV#  2  AP
      .STONE       .....          SEG      LEV#  3  AP
      .JEWELRY     .....          SEG      LEV#  3  AP
      .ITEM        .....          SEG      LEV#  4  AP
      .PARTS       .....          SEG      LEV#  5  AP
      .GENINFO     .....          SEG      LEV#  2  AP
      .SOURCES     .....          SEG      LEV#  3  AP

```

Scroll right (PF10) to expand the size of the search argument field:

```

----- IMS PCB List for AGEMSDB - ----- Row 1 to 20 of 26
COMMAND ==>                                SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME          Data/MSG T S  Leng  OP  -Search Argument-
     PCB#001      D S          --
     GEM          S          120 --
     NAME         F          20 --
     GEM01        F          1 --
     GEM02        F          2 --
     GEM03        F          3 --
     GEM04        F          4 --
     GEM05        F          5 --
     GEM06        F          6 --
     GEM07        F          7 --
     GEM08        F          8 --
     GEM09        F          9 --
     HARDNESS     F          2 --
     COLOUR       S          40 --
     JEWELRY      S          20 --
     ITEM         S          70 --
     PARTS        S          35 --
     GENINFO      S          64 --
     SOURCES      S          20 --

```

Column headings have the following meanings for segments and fields within a PCB:

NAME	When you expand or select a PCB, segment names show in this column indented under the PCB name. When you expand or select a segment, field names show in this column indented under the segment name.
DATA/MSG	Displays a status message or a file processing error code after a line command or FDM subcommand is performed against the PCB, segment, or field. If an error message appears, see "DATA/MSG Column Messages" in Appendix C, "Troubleshooting" .
TYP	<ul style="list-style-type: none"> ■ SEG– Segment within PCB (abbreviated S in the T field) ■ FLD– Field within segment (abbreviated F in the T field)
SL or S	Selected status. If a PCB, segment, or field is currently selected for processing, S appears in this field. Only selected items are targeted by FDM subcommands, such as the Edit command, entered at the Command ==> prompt.
Location	<ul style="list-style-type: none"> ■ For a segment, shows hierarchical level of segment in database tree structure. ■ For a field, shows sequential position of field in segment.
ATTR	<ul style="list-style-type: none"> ■ For a segment, processing attributes are shown. ■ For a field, data type is shown.
Kyl	<ul style="list-style-type: none"> ■ For a segment, maximum concatenated key length in bytes. ■ For fields, this column is blank unless the field is a key field. Key fields show a K, plus any unique key attribute. <p>Displayed only for fields and segments in selected PCBs. Not displayed for fields and segments in expanded PCBs.</p>

Leng	Defined length, in bytes, of the segment or field. Displayed only for fields and segments in selected PCBs. Not displayed for fields and segments in expanded PCBs.
OP	When a PCB is selected, any segments that permit Segment Search Arguments (SSAs) are flagged with ++ in this field. To create an SSA, type a search operator in the OP field and a search argument in the Search Argument field.
Search Argument	When a PCB is selected, any segments that permit Segment Search Arguments (SSAs) are flagged with ALLOWED here. To create an SSA, type a search operator in the OP field and a search argument in the Search Argument field.

Selective Search Arguments (SSAs)

When a PCB is selected in the **PCB List** panel, any segments that accept Segment Search Arguments (SSAs) are flagged with “++ ALLOWED” in the **OP** and **Search Argument** fields.

To create SSAs interactively over these segments, first select the flagged segments of interest by typing the S command the **OPT** column. Then expand the segments with the plus (+) command in the **OPT** column to show their fields. Type a relational operator in the **OP** column and the appropriate field value in the **Search Argument** column for each field on which you wish to filter segments in IMS.

The following relational operators are supported:

Operator	Letter Abbreviation	Symbol Abbreviation
Equal	EQ	=
Not Equal	NE	<>
Less Than	LT	<
Greater Than	GT	>
Less Than or Equal	LE	<=
Greater Than or Equal	GE	>=



CAUTION! For most purposes, it is advisable to include SSAs that filter key fields or subfields in the root segment. If you enter SSAs for other segments or fields, but not for the key field or subfield, the IMS Option performs a full database scan to locate the requested segments. This can take a long time with large databases.

Many IMS databases contain complex keys with multiple subfields. Key subfields need not be contiguous; they may be widely separated or may overlap. In addition, subfields need not all share the same data type. The StarTool FDM IMS Option recognizes that key subfields belong to the higher-level key field. When you enter search arguments for one or more key subfields, the IMS Option automatically converts data types into a common hexadecimal form and concatenates them into a single hexadecimal search argument for the top-level key.

If either the top-level key field or at least one subfield has a search argument, search arguments for other subfields may be omitted. When subfield arguments are omitted, the IMS Option supplies default values as follows:

- When the search operator for the top-level key or the subfield is GT or GE, the subfield search argument default value is hexadecimal zeroes.
- When the search operator for the top-level key or the subfield is EQ, the subfield search argument default value is hexadecimal zeroes.
- When the search operator for the top-level key or the subfield is LT or LE, the subfield search argument default value is hexadecimal FFs.

You will have an opportunity to modify your SSAs when you invoke the editor.

Selecting an Entire Database

The IMS Option allows you to select the entire contents of an IMS database for browsing or editing.

To view or edit all segment types, and *all instances* of those segment types, first select the desired PCB at the **PCB List** panel. For example:

```

----- IMS PCB List for AGEMSDB ----- Row 1 to 3 of 3
COMMAND ===>                               SCROLL ===> CSR

Enter an EDIT, VIEW, BATCH EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
 S   PCB#001    DB      GEMSDB AP   100   --
     PCB#002    DB      IVPDB1 A    10    --
     PCB#003    DB      HIDAMI01 GOT 100   -- INDEX DBD=SECIX02
***** Bottom of data *****

```

Selection automatically expands the PCB to show a list of the segments defined for it. The selected PCB is flagged with an S in the **SL** column.

If no subordinate segments are selected, no SSAs are allowed. All segment types, as well as all instances of those types, will be returned by IMS when you invoke the editor.

To invoke the editor, type the V (View) or E (Edit) command at the **Command ==>** prompt and press Enter. For example:

```

----- IMS PCB List for AGEMSDB - ----- Row 1 to 15 of 15
COMMAND ==> V                               SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
   PCB#001      DB  S  GEMSDB  AP   100   --
     GEM          SEG  LEV#  1  AP    20   120 --
     COLOUR       SEG  LEV#  2  AP    10    40 --
     STONE        SEG  LEV#  3  AP     3    80 --
     JEWELRY      SEG  LEV#  3  AP    10    20 --
     ITEM         SEG  LEV#  4  AP    10    70 --
     PARTS        SEG  LEV#  5  AP    10    35 --
     GENINFO      SEG  LEV#  2  AP     2    64 --
     SOURCES      SEG  LEV#  3  AP    20    20 --
     COLRINFO     SEG  LEV#  3  AP     2    50 --
     ALIASES      SEG  LEV#  3  AP    20    20 --
   PCB#002      DB  IVPDB1  A    10    --
   PCB#003      DB  HIDAMI01 GOT  100   -- INDEX DBD=SECIX02
***** Bottom of data *****

```

The IMS Option displays the **Segment Selection Criteria** panel — the first of several panels associated with editor startup.

Viewing or Editing All Segment Types

To view or edit all segment types, but *only selected instances* of those segment types, first select the desired PCB at the **PCB List** panel. Then use block SS commands in the **OPT** column to select all segments associated with the PCB. For example:

```

----- IMS PCB List for AGEMSDB - ----- Row 1 to 15 of 15
COMMAND ==>                                SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
   PCB#001      DB  S  GEMSDB  AP   100   --
SS   GEM          SEG  LEV#  1  AP    20   120 --
     COLOUR       SEG  LEV#  2  AP    10    40 --
     STONE        SEG  LEV#  3  AP     3    80 --
     JEWELRY      SEG  LEV#  3  AP    10    20 --
     ITEM         SEG  LEV#  4  AP    10    70 --
     PARTS        SEG  LEV#  5  AP    10    35 --
     GENINFO      SEG  LEV#  2  AP     2    64 --
     SOURCES      SEG  LEV#  3  AP    20    20 --
     COLRINFO     SEG  LEV#  3  AP     2    50 --
SS   ALIASES      SEG  LEV#  3  AP    20    20 --
   PCB#002      DB  IVPDB1  A    10    --
   PCB#003      DB  HIDAMI01 GOT  100   -- INDEX DBD=SECIX02
***** Bottom of data *****

```

When you press Enter, all segments types show as explicitly selected. Importantly, the display shows that search arguments are allowed at the root segment level. For example:

```
----- IMS PCB List for AGEMSDB - ----- Row 1 to 15 of 15
COMMAND ==>                                SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
PCB#001      DB S GEMSDB AP 100  --
GEM          *SELECT* SEG S LEV# 1 AP 20 120 ++ ALLOWED
COLOUR      *SELECT* SEG S LEV# 2 AP 10 40  --
STONE       *SELECT* SEG S LEV# 3 AP 3 80  --
JEWELRY     *SELECT* SEG S LEV# 3 AP 10 20  --
ITEM        *SELECT* SEG S LEV# 4 AP 10 70  --
PARTS       *SELECT* SEG S LEV# 5 AP 10 35  --
GENINFO     *SELECT* SEG S LEV# 2 AP 2 64  --
SOURCES     *SELECT* SEG S LEV# 3 AP 20 20  --
COLRINFO    *SELECT* SEG S LEV# 3 AP 2 50  --
ALIASES     *SELECT* SEG S LEV# 3 AP 20 20  --
TRADITON    *SELECT* SEG S LEV# 2 AP 20 60  --
STORIES     *SELECT* SEG S LEV# 2 AP 2 60  --
PCB#002      DB IVPDB1 A 10  --
PCB#003      DB HIDAMI01 G 20  --
***** Bottom of data *****
```

To specify search arguments for the root segment interactively, type the plus (+) command in the **OPT** column for the root segment (Lev# 1 in the **Location** column). The IMS Option expands the root segment and lists its fields.

Enter the desired relational operators in the **OP** column and a search argument in the **Search Argument** column for the fields of interest. For example:

```
----- IMS PCB List for AGEMSDB - ----- Row 1 to 20 of 26
COMMAND ==>                                SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
PCB#001      DB S GEMSDB AP 100  --
+  GEM          *SELECT* SEG S LEV# 1 AP 20 120 ++ ALLOWED
  NAME          FLD      1 CHAR K,U 20 EQ garnet
  GEM01         FLD      1 CHAR      1
  GEM02         FLD      1 CHAR      2
  GEM03         FLD      1 CHAR      3
  GEM04         FLD      1 CHAR      4
  GEM05         FLD      1 CHAR      5
  GEM06         FLD      1 CHAR      6
  GEM07         FLD      1 CHAR      7
  GEM08         FLD      1 CHAR      8
  GEM09         FLD      1 CHAR      9
  HARDNESS     FLD      21 CHAR      2
  COLOUR      *SELECT* SEG S LEV# 2 AP 10 40  --
  STONE       *SELECT* SEG S LEV# 3 AP 3 80  --
  JEWELRY     *SELECT* SEG S LEV# 3 AP 10 20  --
  ITEM        *SELECT* SEG S LEV# 4 AP 10 70  --
  PARTS       *SELECT* SEG S LEV# 5 AP 10 35  --
  GENINFO     *SELECT* SEG S LEV# 2 AP 2 64  --
  SOURCES     *SELECT* SEG S LEV# 3 AP 20 20  --
```



CAUTION! Include the key field or at least one of its subfields in your search arguments. If you do not, StarTool FDM will perform a full database scan to find the desired segments. This may take a long time in large databases.

Type the V (View) or E (Edit) command at the **Command ==>** prompt and press Enter to invoke the editor. The IMS Option displays the **Segment Selection Criteria** panel — the first of several panels associated with editor startup.

Viewing and Editing Selected Segment Types

To view or edit just a few segment types, first select the desired PCB at the **PCB List** panel. Then specify the required segments by typing an S in the **OPT** column for each segment. For example:

```

----- IMS PCB List for AGEMSDB - ----- Row 1 to 15 of 15
COMMAND ==>                                SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
   PCB#001      DB  S  GEMSDB  AP   100    --
S    GEM        SEG  LEV#  1  AP   20   120 --
    COLOUR      SEG  LEV#  2  AP   10   40  --
    STONE       SEG  LEV#  3  AP    3   80  --
S    JEWELRY    SEG  LEV#  3  AP   10   20  --
    ITEM        SEG  LEV#  4  AP   10   70  --
S    PARTS      SEG  LEV#  5  AP   10   35  --
    GENINFO     SEG  LEV#  2  AP    2   64  --
    SOURCES     SEG  LEV#  3  AP   20   20  --
    COLRINFO    SEG  LEV#  3  AP    2   50  --
    ALIASES     SEG  LEV#  3  AP   20   20  --
   PCB#002      DB  IVPDB1  A    10    --
   PCB#003      DB  HIDAMI01 GOT  100    -- INDEX DBD=SECIX02
***** Bottom of data *****

```

Press Enter. The panel is refreshed to show the status of the selected segments and which segments allow Selective Search Arguments (SSAs). For example:

```

----- IMS PCB List for AGEMSDB - ----- Row 1 to 15 of 15
COMMAND ==>                                SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
   PCB#001      DB  S  GEMSDB  AP   100    --
    GEM        *SELECT* SEG S  LEV#  1  AP   20   120 ++ ALLOWED
    COLOUR      SEG  LEV#  2  AP   10   40  ++ ALLOWED
    STONE       SEG  LEV#  3  AP    3   80  --
    JEWELRY    *SELECT* SEG S  LEV#  1  AP   20   120 ++ ALLOWED
    ITEM        SEG  LEV#  4  AP   10   70  --
    PARTS      *SELECT* SEG S  LEV#  1  AP   20   120 --
    GENINFO     SEG  LEV#  2  AP    2   64  --
    SOURCES     SEG  LEV#  3  AP   20   20  --
    COLRINFO    SEG  LEV#  3  AP    2   50  --
    ALIASES     SEG  LEV#  3  AP   20   20  --
   PCB#002      DB  IVPDB1  A    10    --
   PCB#003      DB  HIDAMI01 GOT  100    -- INDEX DBD=SECIX02
***** Bottom of data *****

```

Only the selected segment types are included in any view or edit operation requested at the **Command ==>** prompt of this panel.

Segments flagged with “++ ALLOWED” in the **OP** and **Search Argument** columns allow you to further filter selected segments by field content. To specify search arguments interactively by data field, expand the segments you want to filter using the + command

in the **OPT** column. Then type a search operator in the **OP** column and a search argument in the **Search Arguments** column for each field that you want to filter.



CAUTION! Include the key field or its subfields in your search arguments. If you do not, StarTool FDM will perform a full database scan to find the desired segments. This may take a long time in large databases.

For example:

```
----- IMS PCB List for AGEMSDB - ----- Row 1 to 20 of 26
COMMAND ==>
SCROLL ==> CSR
Enter an EDIT, VIEW, EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
   +  GEM        *SELECT* SEG S  LEV#  1  AP   20   120 ++ ALLOWED
      NAME      FLD      LEV#  1  CHAR K,U   20  EQ  garnet
      GEM01     FLD      LEV#  1  CHAR      1
      GEM02     FLD      LEV#  1  CHAR      2
      GEM03     FLD      LEV#  1  CHAR      3
      GEM04     FLD      LEV#  1  CHAR      4
      GEM05     FLD      LEV#  1  CHAR      5
      GEM06     FLD      LEV#  1  CHAR      6
      GEM07     FLD      LEV#  1  CHAR      7
      GEM08     FLD      LEV#  1  CHAR      8
      GEM09     FLD      LEV#  1  CHAR      9
      HARDNESS  FLD      LEV# 21  CHAR      2
      COLOUR    SEG      LEV#  2  AP   10   40 --
      STONE     SEG      LEV#  3  AP    3   80 --
      JEWELRY   *SELECT* SEG S  LEV#  3  AP   10   20 ++ ALLOWED
      ITEM      SEG      LEV#  4  AP   10   70 --
      PARTS     *SELECT* SEG S  LEV#  5  AP   10   35 --
      GENINFO   SEG      LEV#  2  AP    2   64 --
      SOURCES   SEG      LEV#  3  AP   20   20 --
```

Type the V (View) or E (Edit) command at the **Command ==>** prompt and press Enter to invoke the StarTool FDM editor.

The IMS Option displays the **Segment Selection Criteria** panel — the first of several panels associated with editor startup.

Chapter 2

Viewing and Editing Data

Invoking the Editor

After selecting the desired IMS PSBs at the **PSB MEMLIST** panel and the desired PCBs, segment types, and field values for Segment Search Arguments (SSAs) at the **PCB List** panel, you are ready to invoke the StarTool FDM editor. To do this, type the V (View) or E (Edit) command at the **Command ==>** prompt of the **PCB List** panel and press Enter.

A series of panels displays during editor startup. At your option, you can:

- Choose a copybook to format the data being viewed or edited.
- Filter selected IMS segments more narrowly within the editor.
- Audit changes to the IMS database.

Segment Selection Criteria

Editor startup begins with the **Segment Selection Criteria** panel. This panel identifies the PCB and DBD for the database you are about to view or edit. It also shows the Segment Search Arguments (SSAs) as currently defined. Additional fields prompt you for information used by the editor.

Although identical across databases in most respects, the **Segment Selection Criteria** panel differs slightly for DL/1 and BMP databases.

For DL/1 databases, the **Segment Selection Criteria** panel requests an optional allocation CLIST. For example:

```
----- IMS segment selection criteria for EDIT, VIEW, or Extract -----
COMMAND ==>

When ready, press PF6 to continue with EDIT

FROM PCB PCB#001  DBD GEMSDB  Limit ==> 10000  (max segments to retrieve)

  Use copybook   ==> YES (Yes/No; Yes prompts for copybook, ignored for EXT)
  Record select ==> NO  (Yes/No; Yes prompts for record selection options)
  Audit changes ==> NO  (Yes/No; Yes prompts for audit data set parameters)
  Alloc CLIST    ==>    (CLIST to allocate the Data Bases if needed)

Seg Name Segment search argument
GEM      NAME   EQ garnet

COLOUR

JEWELRY

PARTS
```

With BMP databases, the **Segment Selection Criteria** panel requests an optional IMS authorization token and, for DEDB file types, a Fast Path buffer count. For example:

```

----- IMS segment selection criteria for EDIT, VIEW, or Extract -----
COMMAND ==>

When ready, press PF6 to continue with VIEW

FROM PCB PCB#001  DBD GEMSDB  Limit ==> 10000  (max segments to retrieve

  Use copybook   ==> YES (Yes/No; Yes prompts for copybook, ignored for EXT)
  Record select  ==> NO  (Yes/No; Yes prompts for record selection options)
  Audit changes  ==> NO  (Yes/No; Yes prompts for audit data set parameters)
  Authorization  ==> ABC (If required, IMS AGN token to allow access)
  Buffer count    ==> 4   (If required, Fast Path Buffer Count 1-999)

Seg Name Segment search argument
GEM      NAME   EQ garnet

COLOUR

JEWELRY

PARTS
    
```

In the fixed-format data entry fields, enter the following information:

Limit	Maximum number of segments to retrieve for viewing or editing in the editor. Default value is 10000.
Use Copybook	<ul style="list-style-type: none"> ■ YES- Use a copybook to format segment display in the editor. You will be prompted to select the copybook from a copybook library. ■ NO- Do not use a copybook to format segments (default).
Record Select	<ul style="list-style-type: none"> ■ YES- Use the editor's record selection facility to filter the returned IMS segments. You will be prompted for search criteria. This second-level search optionally refines the primary search performed by IMS using the SSAs you supplied. ■ NO- Do not use the editor's record selection facility (default).
Audit Changes	<ul style="list-style-type: none"> ■ YES- Record all changes made to the IMS database. You will be prompted to allocate a dataset for tracking changes. ■ NO- Do not audit changes (default).
Alloc CLIST	<p>Name of library allocation CLIST to be used by the editor if you entered YES for the Retain Databases option at the DL/1 Data Set Allocation panel.</p> <ul style="list-style-type: none"> • Do not use with dynamically allocated databases. • Does not apply to BMP databases.
Authorization	<p>IMS Application Group Name (AGN) token, if required.</p> <ul style="list-style-type: none"> • Does not apply to DL/1 databases.
Buffer Count	<p>Number of Fast Path buffers to allocate when viewing or editing a BMP DEDB database. Allowed values: 1 to 999.</p> <ul style="list-style-type: none"> • Does not apply to DL/1 databases.

At the bottom of the **Segment Selection Criteria** panel, your current search arguments are displayed in a table. On the left, the **Seg Name** column displays the names of segments that allow SSAs. On the right, the **Segment Search Argument** column displays any SSAs already entered interactively. These SSAs can be deleted or modified at this panel. Scroll down (PF8) to see additional segment names and search arguments. A maximum of 15 SSAs are allowed.

Entries in the **Segment Search Argument** field are free-format. Each entry consists, at minimum, of a field name, a relational operator, and a comparison value. Compound search arguments with the Boolean operators AND, OR, and NOT are allowed, but parentheses and nested expressions are not accepted.

For example, the search argument for the GEM segment might be changed from:
NAME EQ GARNET

to:

NAME EQ GARNET OR NAME EQ TOPAZ

To exit editor startup and return to the **PCB List** panel, press PF3.

To continue with editor startup, press PF6. The SSAs are passed to IMS and selected segments, up to the maximum number you specified, are returned to the editor in a working dataset.

Depending on the options chosen in the **IMS Segment Selection** panel, one or more additional startup panels may display for the following tasks:

- [Copybook Selection for Layout or Vertical Views](#)
- [Extended Copybook Selection and Initialization](#)
- [Record Selection in the Editor](#)
- [Audit Editor Changes](#)

Most of these panels are part of the standard PEDIT startup process and generally behave as described in the *StarTool FDM User's Guide* and the *StarTool FDM Reference*. Differences specific to the IMS Option are described below.

Copybook Selection for Layout or Vertical Views

Copybook selection for standard copybooks proceeds the same way for IMS databases as for other file and database types. The standard copybook view may be toggled between layout mode and vertical mode in the editor.

The **Copybook** panel takes values like those in the following example for standard copybook selection in the IMS Option. The **Copybook Type** field should be COPYBOOK for

a single-record layout view and VERTICAL for a multi-record, tabular, vertical view. Leave the **Extended Copybook Options** section of the panel blank.

```

----- Copybook -----
COMMAND ===>

  Primary command: MAP to view the copybook member before exiting this panel.
                   IMPORT or EXPORT to retrieve or save a copybook object.

  Copybook type      ===> COPYBOOK  (COPYBOOK, EXTENDED, or VERTICAL)

  Copybook or Vertical Copybook data set name:
  Data set           ===> 'USER01.LIB.COPYBOOK'
  Member name        ===> GEM        (name of member if not included in dsn)
  Data set type      ===> MVS        (MVS, Panvalet or Librarian)

  Optional:
  Language type      ===> EITHER     (COBOL, PLI, EITHER, or ASM)
  Starting name      ===>
  Starting column    ===> 1          (1 to 32760 if first variable is offset)

  Extended copybook options:
  Extended copybook  ===>             (Temp, Redo, Create, Mod, Use, Import)
  Copybook save name ===>             (3 to 6 character name used with Mod or Use)
  Source library     ===>             (Profile, Group, Sample, or Other)
  Other DSNAME       ===>

  Notes:

```

Press Enter. The editor screen displays, identifying the PSB, PCB, and DBD associated with the displayed segment.

In layout mode (COPYBOOK type), data is shown one record per screen. For example:

```

PEDIT-VIEW PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB ---          Record too short
COMMAND ===>                                               SCROLL ===> CSR
RECORD      1      LENGTH=      20  JEWELRY
LEVEL AND NAME                LENGTH TYP DATA ...1...+...2...+...3...+
01 GEM                          120
05 NAME-OF-JEWEL                20 CHR EARRINGS
05 COMPOSITION                  50 CHR *EOR*
05 HARDNESS                      2 DIS *EOR*
05 CRYSTAL-STRUCT               20 CHR *EOR*
05 SPEC-GRAVITY                  3 DIS *EOR*
05 REFRACTION                    4 DIS *EOR*
05 DISPERSION                    3 DIS *EOR*
05 TOUGHNESS                      8 CHR *EOR*
05 FILLER                        10 CHR *EOR*
***** ***** BOTTOM OF COPYBOOK-BYTES TOO SHORT FOR CB:  100 *

```

In vertical mode, multiple records are shown per screen. The arrangement is tabular, with field names listed across the top of the panel. Use the left and right scrolling keys (PF10 and PF11) to view all fields for each record. For example:

```

PEDIT-VIEW PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB --- Record too short
COMMAND ==> SCROLL ==> CSR
NAME          |GEM          |NAME-OF-JEWEL      |COMPOSITION
TYPE          |LV1 120     |CHR 20             |CHR 50
COLUMN       |(1:120)     |(1:20)            |(21:51>
NUMBER        |1           |2                 |3
*****
***** TOP OF DATA *****
000001 JEWELRY          EARRINGS          *EOR*
000002 PARTS        GOLD              000100120G RAMS
000003 PARTS        GR GARNET        000200035C T
000004 PARTS        GOLD              000100100G RAMS
000005 PARTS        GR GARNET        000200028C T
000006 JEWELRY          STRAND            *EOR*
000007 PARTS        GARNET           150007 I NCH
000008 PARTS        GARNET           150007 I NCH
000009 PARTS        GARNET           150007 I NCH
000010 PARTS        GARNET           150007 I NCH
000011 PARTS        GARNET           150006 I NCH
000012 PARTS        GARNET           150008 I NCH
000013 PARTS        GARNET           150006 I NCH
000014 JEWELRY          YRING            YELLOWGOL *EOR*
000015 PARTS        DIAMONDS         000400015C T
000016 PARTS        GOLD              000100280G RAMS
000017 PARTS        TSAVORITE        000100046C T

```

Change the display from layout mode to vertical mode, typing VERT at the **Command ==>** prompt. Change the display from vertical mode to layout mode, type CB at the **Command ==>** prompt.

You cannot toggle between a standard copybook view and an extended copybook view.

Extended Copybook Selection and Initialization

With extended copybooks, the copybook selection process has been modified for IMS. Multiple segment types can be formatted concurrently using multiple copybook members. Copybook selection in the editor is dynamic, based on segment content.

Dynamic copybook selection requires at least one copybook member in the copybook library for each segment in the IMS database. The editor constructs record formats dynamically from a "base" copybook format for the root segment of the database, plus appropriate "extension" copybooks for different segment types. Copybooks are initialized with segment names and comparison strings that determine which copybook member is used by the editor for which segments. Initializing this copybook data can be done manually for each segment type or automatically based on the IMS database structure.

Copybook Selection

To use an extended copybook to view or edit IMS data, type a **Copybook Type** field value of EXTENDED at the **Copybook** panel. Leave the fields in the **Copybook or Vertical Copybook** section of the panel blank. Entries should be provided in the **Extended**

Copybook Options section according to the usual considerations for extended copybooks. (See the *StarTool FDM Reference* for details.)

For example:

```
----- Copybook -----
COMMAND ===>

Primary command: MAP to view the copybook member before exiting this panel.
                  IMPORT or EXPORT to retrieve or save a copybook object.

Copybook type    ===> EXTENDED (COPYBOOK, EXTENDED, or VERTICAL)

Copybook or Vertical Copybook data set name:
Data set         ===>
Member name      ===>          (name of member if not included in dsn)
Data set type    ===>          (MVS, Panvalet or Librarian)

Optional:
Language type    ===> EITHER   (COBOL, PLI, EITHER, or ASM)
Starting name    ===>
Starting column  ===> 1        (1 to 32760 if first variable is offset)

Extended copybook options:
Extended copybook ===> TEMP    (Temp, Redo, Create, Mod, Use, Import)
Copybook save name ===>          (3 to 6 character name used with Mod or Use)
Source library   ===> PROFILE  (Profile, Group, Sample, or Other)
Other DSNAMES    ===>
```

Press Enter. The **Initialize Extended Copybook from IMS Structure** panel displays.

```
----- Initialize Extended Copybook from IMS structure -----
COMMAND ===>

Initialize Copybooks    ===> 1   1 Do not use IMS structure
                           2 Initialize for all segments
                           3 Initialize for selected segments

Specify the copybook data set in normal TSO syntax:
Data set name          ===> 'USER01.LIB.COPYBOOK'
Member name prefix     ===> PFX   (Prefix to be added to segment name)
Data set type          ===> MVS   (MVS, Panvalet or Librarian)
Language type          ===> EITHER (COBOL, PLI, EITHER, or ASM)

Notes:

When the Language type is set to EITHER, PEDIT will try to determine
the language type dynamically based on the statements scanned.

The member prefix will be added to the segment name to form
the member name and the result will be truncated as needed

Additional editing may be required of each resulting copybook
entry (i.e. the copybook member name may not match the segment name)
```

Enter the following information:

Initialize Copybooks	Required. Enter one of the following values: 1 =Do not initialize copybooks from IMS. You will be prompted to initialize each copybook manually. 2 =Initialize copybooks from IMS for all segment types. 3 =Initialize copybooks from IMS for some segment types.
Dataset Name	DSN of copybook library in TSO syntax, delimited by single quotes. Do not include a member name.
Member Name Prefix	Prefix to be added to the segment name in order to yield a copybook member name. Used to distinguish copybook classes. If omitted, the IMS Option assumes that copybook names in the copybook library match the names of the segments to which each copybook will be applied in the editor; no prefix is added. To define multiple copybooks for each segment type depending on the value of a string in the root segment, initialize copybooks manually and leave this field blank.
Dataset Type	The dataset manager type for the copybook library. Accepted values are MVS, Panvalet, or Librarian.
Language Type	Accepted values are COBOL, PLI, EITHER, or ASM.

Copybook Initialization Using IMS Structure

The content shown on the **Extended Copybook** panel depends on the value you entered in the **Initialize Copybooks** field of the **Initialize Extended Copybook from IMS Structure** panel. Data entry is easier if you initialize your copybooks using information pulled from the IMS database structure.

- **If you entered 2 to initialize copybooks from IMS for all segment types**, all segments defined for the selected IMS database are listed on the **Extended Copybook** panel. For example:

```
----- Extended Copybook -----
COMMAND ==>>

Primary commands: S to Save this list, A to Activate this list, END to cancel,
                  E to Export an extended copybook object file.
Line commands can be entered one at a time. Use "field level help" for list.
                                                    More:      +

      Type Member      Level 01 name      Lang Type Selection
S      1 BAS PFXGEM      EITHER      YES
-      2 BAS PFXCOLOUR  EITHER      YES
-      3 BAS PFXSTONE   EITHER      YES
-      4 BAS PFXJEWELRY EITHER      YES
-      5 BAS PFXITEM    EITHER      YES
-      6 BAS PFXPARTS   EITHER      YES
-      7 BAS PFXGENINFO EITHER      YES
-      8 BAS PFXSOURCES  EITHER      YES
-      9 BAS PFXCOLRINFO EITHER      YES
-     10 BAS PFXALIASES  EITHER      YES
-     13 NA              EITHER      NA
-     14 NA              EITHER      NA
```

- **If you entered 3 to initialize copybooks from IMS for a subset of segment types**, the **Extended Copybook** panel includes only the segments you selected at the **PCB List** panel before invoking the editor.

Member names are shown for all segments with the prefix you specified in the **Member Name Prefix** field of the **Initialize Extended Copybook from IMS Structure** panel.

To verify the automated initialization of these copybooks, perform the following steps.

- 1 Verify that all member names and prefixes are accurate in the **Extended Copybook** panel.
- 2 To view or edit copybook data, type the S line command at each copybook member of interest and press Enter. The **Extended Copybook #1** panel displays.

```

----- Extended Copybook #1 -----
COMMAND ==>

Primary command: MAP to view the copybook member before exiting this panel.
                                                    More:  +

Specify the copybook data set and member in normal TSO syntax:
Data set and member      ==> 'USER01.LIB.COPYBOOK'
Member name              ==> PFXGEM      (member if not included in dsname)
Data set type            ==> MVS         (MVS, Panvalet or Librarian)
Language type           ==> EITHER      (COBOL, PLI, EITHER, or ASM)
Starting name           ==>              (for base only)
Type                    ==> BASE        (BASE, SEGMENT, CHAINED, or NA)
Column number           ==>              (1-32760 or Blank for default)
Compare operator/Length ==> EQ          (LT,LE,EQ,GE,GT,NE or 0-32760)
Compare Strings         ==> name, garnet (string,string)
  AND/OR ==> OR
Column number           ==>              (1-32760 or Blank for no compare)
Compare operator/Length ==> EQ          (LT,LE,EQ,GE,GT,NE or 0-32760)
Compare Strings         ==> name, topaz  (string,string)

Notes: Press ENTER after you have specified all parameters.
       Press END to bypass verification of the copybook and parameters

```

- 3 Make any desired changes for the selected copybook and press Enter.
- 4 If multiple copybooks were selected in the **Extended Copybook** panel, each copybook displays in top-down order in the **Extended Copybook #1** panel. Review or change each in turn and press Enter when done.
- 5 When all selected copybooks have been reviewed, the IMS Option returns you to the original **Extended Copybook** panel. Type A at the **Command ==>** prompt of this panel and press Enter to activate the copybook list.

Manual Copybook Initialization

If you choose to initialize copybooks manually, the **Extended Copybook** panel displays an empty list of copybook members. For example:

```
----- Extended Copybook -----
-
COMMAND ===>

Primary commands: S to Save this list, A to Activate this list, END to cancel,
                  E to Export an extended copybook object file.
Line commands can be entered one at a time. Use "field level help" for list.
                                                    More:    +

   Type Member      Level 01 name          Lang Type Selection
-   1 NA              EITHER  NA
-   2 NA
-   3 NA              EITHER  NA
-   4 NA              EITHER  NA
-   5 NA              EITHER  NA
```

To initialize extended copybooks manually for IMS, perform the following steps

- 1 Select the first blank entry in the panel by typing an S in the line command column.
For example:

```
----- Extended Copybook -----
COMMAND ===>

Primary commands: S to Save this list, A to Activate this list, END to cancel,
                  E to Export an extended copybook object file.
Line commands can be entered one at a time. Use "field level help" for list.
                                                    More:    +

   Type Member      Level 01 name          Lang Type Selection
S   1 NA              EITHER  NA
-   2 NA              EITHER  NA
-   3 NA              EITHER  NA
-   4 NA              EITHER  NA
-   5 NA              EITHER  NA
```

- 2 Press Enter to display a blank **Extended Copybook #1** panel.

```

----- Extended Copybook #1 -----
COMMAND ==>

Primary command: MAP to view the copybook member before exiting this panel.
                                                    More:  +

Specify the copybook data set and member in normal TSO syntax:
Data set and member      ==>
Member name              ==>          (member if not included in dsname)
Data set type            ==> MVS      (MVS, Panvalet or Librarian)
Language type            ==> EITHER   (COBOL, PLI, EITHER, or ASM)
Starting name            ==>          (for base only)
Type                     ==> BASE    (BASE, SEGMENT, CHAINED, or NA)
Column number            ==>          (1-32760 or Blank for default)
Compare operator/Length ==> EQ       (LT,LE,EQ,GE,GT,NE or 0-32760)
Compare Strings          ==>          (string,string)
  AND/OR ==> OR
Column number            ==>          (1-32760 or Blank for no compare)
Compare operator/Length ==> EQ       (LT,LE,EQ,GE,GT,NE or 0-32760)
Compare Strings          ==>          (string,string)

Notes: Press ENTER after you have specified all parameters.
       Press END to bypass verification of the copybook and parameters

```

In this panel, enter the appropriate values to map copybook names to segment names and to create the desired comparison strings to trigger the application of the named copybook. Then press Enter. Your entries are used by the editor to initialize the named copybook.

- 3 Repeat Steps 1 and 2 until all desired copybooks are initialized.



TIP To use different copybooks with the same segment type and switch copybooks dynamically based on segment data as well as segment name, you must initialize extended copybooks manually. Give each copybook for the segment a different prefix in the copybook name.

Record Selection in the Editor

When you invoke the StarTool FDM editor, you can request a record filtering pass in the editor that further refines the selections IMS makes based on your Segment Search

Arguments (SSAs). If you request this option, the **PEDIT Record Selection** panel displays during editor setup.

```

----- PEDIT: Record selection panel -----
OPTION ==>
  Enter SAVE to save or enter LOAD to load a previously saved table
- DSN=IMS.PSBLIB,VOL=SER=OS3P9B MEM=AGEM* -----
  -
                                                                 More:   +
Record selection by count, set any as needed:
Starting record number ==>          (1-99999999 or blank to ignore)
Max records to select   ==>          (1-99999999 or blank to ignore)
Interval of selection   ==>          (2-99999999 or blank to ignore)
Max records to search   ==>          (1-99999999 or blank to ignore)
Force read to end      ==> NO (Yes or No; read all records before display)

Additional record selection by content:
1. Column number/name   ==>          (Blank for none)
   Compare operator/Length ==> EQ      (LT,LE,EQ,GE,GT,NE,etc or 0-32760)
   Compare Strings       ==>          (char or hex)
   AND/OR/THN ==> OR
2. Column number/name   ==>          (Blank for none)
   Compare operator/Length ==> EQ      (LT,LE,EQ,GE,GT,NE,etc or 0-32760)
   Compare Strings       ==>          (char or hex)
   AND/OR/THN ==> OR
3. Column number/name   ==>          (Blank for none)
   Compare operator/Length ==> EQ      (LT,LE,EQ,GE,GT,NE,etc or 0-32760)
   Compare Strings       ==>          (char or hex)

```

Values entered at this panel have their standard meanings for PEDIT.

Press PF6 to continue editor startup. The **PEDIT Selection Statistics** panel summarizes the results of the filtering process. For example:

```

                PEDIT Selection Statistics
OPTION =>

RECORDS READ      =          5
RECORDS SELECTED =          4
MAXIMUM LIMIT REACHED BEFORE END OF FILE

```

Press Enter to continue with editor startup.

Audit Editor Changes

When you invoke the StarTool FDM editor, you can request that the editor log all changes to the IMS database in an audit dataset. If you request this option, the **Audit Initialization** panel prompts you to allocate the audit dataset.

For example:

```

----- Audit initialization -----
COMMAND ==>

Specify the audit data set (fully qualified and un-quoted)
  Data set          ==> DSHIGEM.PEAUDIT.Y2002.M0801.T1713001

Specify Primary and secondary space in tracks:
  Primary           ==> 10      value in tracks
  Secondary         ==> 60      value in tracks
  Output in HEX     ==> YES     (Yes/No; Yes to always output in HEX,
                                otherwise, output in current mode)

Notes: a record image of each changed record will be made before and after
       each data change in the PEDIT session.

```

Type the requested information and press Enter.

IMS Considerations When Working with PEDIT

The StarTool FDM editor PEDIT works somewhat differently with IMS data than it does with data retrieved from other file types. The following considerations apply to IMS:

- **Only data physically retrieved by the editor can be changed by the editor.** Browse to the *** Bottom of Data *** marker in the editor before editing to ensure all selected IMS segments can be updated.
- **Changes to IMS data are made when you press Enter**, not when you enter a PEDIT line command to modify the working copy of the data. Changes to the IMS database are also posted when you remove a ==PEN> flag.
- **Changes to the IMS database are committed when you press Enter.** You cannot cancel a change by typing the CANCEL command at the **Command ==>** prompt. Pressing PF3 to exit does not cancel a change.
- **To reverse a change committed by PEDIT**, either manually restore the segments to their former value using StarTool FDM, or use the LOG file created by StarTool FDM as input for IMS recovery.
- **Non-keyed segments or segments with non-unique primary keys** can be viewed without restriction. However, when working with multiple segments currently, you cannot insert, delete, or update records with non-unique primary keys, and non-keyed segments can be updated only with restrictions. To insert, delete, or update such segments individually, use the Single Segment Interface (SSI). (See [Chapter 3, "Single Segment Interface \(SSI\)"](#).)
- **If an ABEND occurs during the PEDIT session**, changes may not be posted to the IMS database from the PEDIT working dataset.

When you invoke PVIEW or PEDIT, the IMS Option connects to IMS. When you end the PEDIT session, the session with IMS also terminates. The following IMS termination message displays after every PEDIT session. Press enter to continue.

```
DFS627I IMS RTM CLEANUP (EOT) COMPLETE FOR ST tso-userid ... RC=00
```

IMS Data Viewing Features

In both VIEW mode and EDIT mode, PEDIT provides special features for viewing IMS data. They are:

- [Indenting Segments in Editor View](#)
- [Displaying the Concatenated Key](#)

Indenting Segments in Editor View

The SEGMENT command toggles the display of segment names along with segment data in PEDIT. It also optionally indents segments to mirror their relationships in the IMS tree hierarchy. Enter the SEGMENT command at the **Command ==>** prompt.

The SEGMENT command has the following syntax:

```
SEGMENT ON|OFF|INDENT
```

Examples:

```
SEGMENT ON
```

```
SEGMENT INDENT
```

```
SEGMENT OFF
```

The following PEDIT panel shows segments indented and segment names displayed.

```
PEDIT-VIEW PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB --- COLUMNS 000001 000058
COMMAND ==>                                SCROLL ==> CSR
***** ***** TOP OF DATA
*****
000001  JEWELRY  EARRINGS
000002  PARTS    GOLD      000100120GRAMS
000003  PARTS    GR GARNET 000200035CT
000004  PARTS    GOLD      000100100GRAMS
000005  PARTS    GR GARNET 000200028CT
000006  JEWELRY  STRAND
000007  PARTS    GARNET    150007  INCH
000008  PARTS    GARNET    150007  INCH
000009  PARTS    GARNET    150007  INCH
000010  PARTS    GARNET    150007  INCH
000011  PARTS    GARNET    150006  INCH
000012  PARTS    GARNET    150008  INCH
000013  PARTS    GARNET    150006  INCH
***** ***** BOTTOM OF DATA
*****
```

Displaying the Concatenated Key

An IMS-specific line command displays the concatenated IMS key for any segment. Simply type a K on the line for the segment whose key you would like to view and press Enter to retrieve the key.

For example:

```

PDSPN33      PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB --- COLUMNS 000001 000059
COMMAND ==>>                                SCROLL ==>> CSR
000039 STONE      R04 0000725000018199REDORANGE SLIGHTINC  AFRICA
000040 STONE      R05 0000450000009099ORANGERED CLEAN      AFRICA
K00041 STONE      R06 0000305000007699ORANGERED FLAWLESS   AFRICA
000042 STONE      R07 0000360000005499RED          FLAWLESS   AFRICA
000043 STONE      R08 0000150000003799ORANGE       FLAWLESS   AFRICA
000044 STONE      R09 0000145000003699ORANGE       FLAWLESS   AFRICA
000045 STONE      R10 0000246000003699DRKRED       FLAWLESS   AFRICA
000046 STONE      R11 0000330000002999RED         CLEAN      AFRICA
000047 STONE      R12 0000325000002999RED         CLEAN      AFRICA
000048 STONE      R13 0000135000002099REDORANGE   FLAWLESS   AFRICA
000049 STONE      R14 0000121000001899ORANGERED   FLAWLESS   AFRICA
000050 STONE      R15 0000075000000599ORANGERED   VERYSLIGHTINCAFRICA
000051 STONE      R16 0000092000000699ORANGERED   VERYSLIGHTINCAFRICA
000052 STONE      R17 0000495000004499ORANGERED   CLEAN      AFRICA
000053 JEWELRY    STRAND
000054 ITEM       S000000010 0000001299      20000216      239.3 CT ROUND B
000055 ITEM       S000000020 0000001299      20000216      216.3 CT ROUND B
000056 ITEM       S000000030 0000001299      20000216      216.6 CT ROUND B
000057 ITEM       S000000040 0000001299      20000216      221.3 CT ROUND B
000058 ITEM       S000000050 0000000899      20000216      164.1 CT ROUND B
000059 ITEM       S000000060 0000000899      20000216      171.0 CT ROUND B
000060 ITEM       S000000070 0000000799      20000216      156.6 CT ROUND B

```

When you press Enter, the **Concatenated Key** panel displays.

```

PDSPEIMK -- PEDIT IMS Concatenated key -----
OPTION ==>>

GEM=GARNET ,COLOUR=RED ,STONE=R06

```

Press PF3 to return to the editor panel.

Editing IMS Data

The standard PEDIT line commands have the same functions for IMS data as they do for other types of data. However, the hierarchical structure of an IMS database modifies the behavior of these commands in some circumstances.

Updating an Existing Segment

To update the data portion of an existing segment with PEDIT, navigate to that segment, overwrite the old data with the new data, and press Enter.

The key portion of a segment cannot be updated directly. To change a key, copy or repeat the segment in the PEDIT work file, then change the key of the copied or repeated segment. You can then delete the old segment.

Editing Non-keyed Segments or Segments with Non-unique Keys

PEDIT allows you to view multiple non-keyed segments or segments with non-unique keys without restriction. However, when you work with multiple segments concurrently, there are restrictions on editing these segments.

To edit a non-keyed segment in multisegment mode, you must first select all non-keyed children under the same parent. You can then edit one or more of the child segments.

You cannot edit segments with non-unique primary keys in multisegment mode.

To edit individual non-keyed segments or segments with non-unique keys, use the Single Segment Interface (SSI). (See [Chapter 3, "Single Segment Interface \(SSI\)"](#).)

Editing Variable-Length Records

You cannot increase the length of a variable-length record in PEDIT, but you can decrease it. To do this, switch to hexadecimal view in EDIT mode and change the excess bytes at the end of the data portion of the segment to x'00'. (Trailing blanks, x'40', are interpreted as valid data.) Press Enter. IMS adjusts the byte count in the length portion of the segment to match the edited data.



NOTE The LL command has no effect on the length of IMS segments.

Deleting a Segment

To delete an existing segment, type the D line command for that segment and press Enter. To delete a block of segments at once, type the DD line command at the first and last segments delimit a block of segments for deletion, then press Enter.

PEDIT does not allow a parent segment to be deleted unless you first explicitly delete all the children of that parent. Automatic mass deletion of children by IMS is not permitted by PEDIT.



NOTE If the block deletion of segments includes a parent, it must also include all of that parent's children or an error message will display.

Inserting a New Segment

The IMS Option dynamically protects the hierarchical structure of the IMS database during segment insertion. In addition, the IMS insertion rules defined by your DBA for LAST, FIRST, and HERE are enforced.

The following rules apply to segment insertions in PEDIT:

- When inserting a segment at the start of the working dataset (that is, at the first line of the PEDIT panel under the *** Top of Data *** marker), you must insert a root segment. No other segment type is accepted.
- When inserting a segment anywhere else, PEDIT prompts you to select the segment type from a list of segment types that are valid at that position in the database hierarchy.

Inserting Root Segments

To insert a new root segment above the first line of data on the PEDIT panel, type the I line command at line 000001 and press Enter. PEDIT inserts a blank record at the top of its working dataset and labels it with the root segment type. The segment is then flagged as pending further data entry with **==PEN>** in the line number column.

For example:

```
PDSPN33      PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB --- COLUMNS 000001 000059
COMMAND ===>                                SCROLL ===> CSR
***** TOP OF DATA *****
==PEN> GEM
000002 GEM          RUBY          ALUMINUM OXIDE, VARIETY OF CORUNDUM e
000003 COLOUR      RED
000004 STONE       R01 0001800000014499PINKRED  SOMEINCLUSIONTHAILAND
```

Complete the record by typing values for all required fields. Be sure to include a unique primary key. Then press Enter.

PEDIT posts the inserted segment from its working dataset to the IMS database.

Inserting Child Segments

Assume you want to insert a child segment three levels down in the database hierarchy. Database levels are visible in the editor because you used the SEGMENT command to turn on segment indenting.

To begin the insertion process, type the I line command on the line immediately preceding the point at which you want to insert the new segment. Your entry might look something like this:

```
PDSPN33      PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB --- COLUMNS 000001 000059
COMMAND ===>                                SCROLL ===> CSR
000168 STONE      PY7 0002820000001599PURPLEYELLFLAWLESS  BOLIVIA
000169 STONE      PY8 0002120000001299PURPLEYELLFLAWLESS  BOLIVIA
000170 GEM        CITRINE          SILICON DIOXIDE
000171 GEM        JADE          JADEITE / NEPHRITE
000172 COLOUR     GREEN
000173 STONE      G01 0003860000007799AQUA      FLAWLESS  BURMA
000174 STONE      G02 0002850000005799AQUA      CLEAN     BURMA
000175 STONE      G03 0002710000004899AQUA      CLEAN     BURMA
000176 GEM        IOLITE
000177 GEM        SPINEL          MAGNESIUM ALUMINUM OXIDE
000178 COLOUR     GREEN
000179 STONE      G01 0003860000007799AQUA      FLAWLESS  BURMA
000180 STONE      G02 0002850000005799AQUA      CLEAN     BURMA
I00181 STONE      G03 0002710000004899AQUA      CLEAN     BURMA
000182 COLOUR     ORANGE
000183 STONE      001 0003400000040899ORANGE      FLAWLESS  BURMA
000184 STONE      002 0003150000028399ORANGE      FLAWLESS  BURMA
000185 STONE      003 0004560000027399ORANGE      CLEAN     BURMA
000186 STONE      004 0002550000019199ORANGE      FLAWLESS  BURMA
000187 STONE      005 0002660000011999ORANGE      CLEAN     BURMA
000188 STONE      006 0001900000011499ORANGE      FLAWLESS  BURMA
000189 STONE      007 0001910000011499ORANGE      FLAWLESS  BURMA
```

When you press Enter, PEDIT displays the **Insert IMS Segment** prompt panel.

```
PDSPEIM2 -- PEDIT Insert IMS Segment -----
OPTION ==> 4

Enter Segment number from list below ==>
 2 COLOUR
 3 STONE
 4 JEWELRY
```

The panel lists valid segment types for the chosen position in the database. Each segment type is preceded by an option number. Type desired option number at the **Option ==>** prompt and press Enter.

PEDIT inserts a new record in its working dataset and labels it with the chosen segment type. The record is marked as pending further data entry with the **==PEN>** flag.

For example:

```
PDSPN33      PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB --- COLUMNS 000001 000059
COMMAND ==>                                     SCROLL ==> CSR
000168 STONE      PY7 0002820000001599PURPLEYELLFLAWLESS  BOLIVIA
000169 STONE      PY8 0002120000001299PURPLEYELLFLAWLESS  BOLIVIA
000170 GEM        CITRINE                                SILICON DIOXIDE
000171 GEM        JADE                                  JADEITE / NEPHRITE
000172 COLOUR     GREEN
000173 STONE      G01 0003860000007799AQUA              FLAWLESS  BURMA
000174 STONE      G02 0002850000005799AQUA              CLEAN     BURMA
000175 STONE      G03 0002710000004899AQUA              CLEAN     BURMA
000176 GEM        IOLITE
000177 GEM        SPINEL                                MAGNESIUM ALUMINUM OXIDE
000178 COLOUR     GREEN
000179 STONE      G01 0003860000007799AQUA              FLAWLESS  BURMA
000180 STONE      G02 0002850000005799AQUA              CLEAN     BURMA
000181 STONE      G03 0002710000004899AQUA              CLEAN     BURMA
==PEN> JEWELRY
000183 COLOUR     ORANGE
000184 STONE      001 0003400000040899ORANGE            FLAWLESS  BURMA
000185 STONE      002 0003150000028399ORANGE            FLAWLESS  BURMA
000186 STONE      003 0004560000027399ORANGE            CLEAN     BURMA
000187 STONE      004 0002550000019199ORANGE            FLAWLESS  BURMA
000188 STONE      005 0002660000011999ORANGE            CLEAN     BURMA
000189 STONE      006 0001900000011499ORANGE            FLAWLESS  BURMA
```

Type the data required to complete the record. Be sure any key fields are assigned a unique key value. The press Enter.

PEDIT posts the inserted segment to the IMS database.

Inserting Multiple Segments

The I line command followed by a decimal number of lines to insert will insert multiple IMS segments at once. For example, the line command I5 would direct PEDIT to insert five new segments immediately following the line on which the command is typed.

When you press Enter, the **Insert IMS Segment** prompt panel displays. Select a segment type and press Enter. All inserted records are assigned the same segment type.

All records are otherwise blank, and are flagged as pending further data entry with the **==PEN>** flag. For example:

```

PDSPN33      PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB --- COLUMNS 000001 000059
COMMAND ===>
000024 STONE      001 0000590000014799ORANGE      CLEAN      AFRICA
000025 STONE      002 0000560000012399ORANGE      CLEAN      AFRICA
000026 STONE      003 00003830000007699ORANGE      SLIGHTINC  AFRICA
000027 STONE      004 00002120000007499ORANGE      CLEAN      AFRICA
000028 STONE      005 00002320000006999REDORANGE  CLEAN      AFRICA
000029 STONE      006 0000590000005999ORANGERED  CLEAN      AFRICA
I50030 COLOUR      RED
==PEN> STONE
==PEN> STONE
==PEN> STONE
==PEN> STONE
==PEN> STONE
000036 STONE      R01 00009230000036999RED      CLEAN      AFRICA
000037 STONE      R02 00017450000026199DRK RED  FLAWLESS  AFRICA
000038 STONE      R03 00016460000024699DRK RED  FLAWLESS  AFRICA
000039 STONE      R04 00007250000018199REDORANGE  SLIGHTINC  AFRICA
000040 STONE      R05 00004500000009099ORANGERED  CLEAN      AFRICA
000041 STONE      R06 00003050000007699ORANGERED  FLAWLESS  AFRICA
000042 STONE      R07 00003600000005499RED      FLAWLESS  AFRICA
000043 STONE      R08 00001500000003799ORANGE      FLAWLESS  AFRICA
000044 STONE      R09 00001450000003699ORANGE      FLAWLESS  AFRICA
000045 STONE      R10 00002460000003699DRKRED  FLAWLESS  AFRICA

```

Type the data required to complete the pending records. Be sure any key fields are assigned a unique key value. The press Enter.

PEDIT posts the inserted segments to the IMS database.

Copying Segments

When working with multiple segments at once, as PEDIT normally does, inserted segments must have unique keys when they are posted to the IMS database. However, a segment copy is identical to its source segment — including its key. PEDIT detects the duplicate key value and enforces the unique-key constraint automatically.

Copying Single Segments

To copy a segment, first type the C line command on the line to be copied. Then find a target segment adjacent to position where the copy should be inserted. Type the A line command in the line number column of the target segment if the copied segment should be inserted above the target. Type the B line command if the copied segment should be inserted below the target.

The IMS Option first verifies that the new position for the copied record is valid in the database structure. If the insertion point is not valid, PEDIT displays the following message:

The segment(s) cannot be insert at this point in the data base structure

If the segment copy is allowed in the target position, PEDIT creates a copied record at that position in the working dataset. But because the key value in the copied segment is a duplicate of the key in the source segment, the record is marked as pending further data entry with the **==PEN>** flag. You must change the key in the copied segment to a unique value, then press Enter.

PEDIT then posts the updated, copied record to the IMS database.

Copying Multiple Segments

Block copies of segments are permitted if they respect the structure of the IMS database.

For example, a level-one segment and its children might be copied in a block to a position just below a root segment with no children. However, they could not be copied to a position below a level-two segment, as that would violate the structure of the tree hierarchy.

The CC block line command is used for block copies. A block copy request might look something like this:

```

PDSPN33      PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB --- COLUMNS 000001 000059
COMMAND ==>>                                SCROLL ==>> CSR
000168  STONE      PY7 0002820000001599PURPLEYELLFLAWLESS      BOLIVIA
000169  STONE      PY8 0002120000001299PURPLEYELLFLAWLESS      BOLIVIA
000170  GEM        CITRINE                      SILICON DIOXIDE
A00171  GEM        JADE                      JADEITE / NEPHRITE
000172  GEM        IOLITE
000173  GEM        SPINEL                      MAGNESIUM ALUMINUM OXIDE
CC0174  COLOUR     GREEN
000175  STONE      G01 0003860000007799AQUA      FLAWLESS      BURMA
000176  STONE      G02 0002850000005799AQUA      CLEAN         BURMA
CC0177  STONE      G03 0002710000004899AQUA      CLEAN         BURMA
000178  COLOUR     ORANGE
000179  STONE      001 0003400000040899ORANGE      FLAWLESS      BURMA
000180  STONE      002 0003150000028399ORANGE      FLAWLESS      BURMA
000181  STONE      003 0004560000027399ORANGE      CLEAN         BURMA
000182  STONE      004 0002550000019199ORANGE      FLAWLESS      BURMA
000183  STONE      005 0002660000011999ORANGE      CLEAN         BURMA
000184  STONE      006 0001900000011499ORANGE      FLAWLESS      BURMA
000185  STONE      007 0001910000011499ORANGE      FLAWLESS      BURMA
000186  STONE      008 0001800000010899ORANGE      FLAWLESS      BURMA
000187  STONE      009 0001610000009699ORANGE      FLAWLESS      BURMA
000188  COLOUR     PINK
000189  STONE      P01 00038300000034099PINK      FLAWLESS      BURMA

```

After the records are copied in the PEDIT working dataset, the PEDIT panel might look something like this:

```

PDSPN33      PSB=AGEMSDB ,PCB=PCB#001 ,DBD=GEMSDB --- COLUMNS 000001 000059
COMMAND ==>>
000168 STONE PY7 0002820000001599PURPLEYELLFLAWLESS BOLIVIA
000169 STONE PY8 0002120000001299PURPLEYELLFLAWLESS BOLIVIA
000170 GEM CITRINE SILICON DIOXIDE
000171 GEM JADE JADEITE / NEPHRITE
==PEN> COLOUR GREEN
==PEN> STONE G01 0003860000007799AQUA FLAWLESS BURMA
==PEN> STONE G02 0002850000005799AQUA CLEAN BURMA
==PEN> STONE G03 0002710000004899AQUA CLEAN BURMA
000176 GEM IOLITE
000177 GEM SPINEL MAGNESIUM ALUMINUM OXIDE
000178 COLOUR GREEN
000179 STONE G01 0003860000007799AQUA FLAWLESS BURMA
000180 STONE G02 0002850000005799AQUA CLEAN BURMA
000181 STONE G03 0002710000004899AQUA CLEAN BURMA
000182 COLOUR ORANGE
000183 STONE 001 00034000000040899ORANGE FLAWLESS BURMA
000184 STONE 002 00031500000028399ORANGE FLAWLESS BURMA
000185 STONE 003 00045600000027399ORANGE CLEAN BURMA
000186 STONE 004 00025500000019199ORANGE FLAWLESS BURMA
000187 STONE 005 00026600000011999ORANGE CLEAN BURMA
000188 STONE 006 00019000000011499ORANGE FLAWLESS BURMA
000189 STONE 007 00019100000011499ORANGE FLAWLESS BURMA

```

The copied records are marked as pending further data entry with **==PEN>**. Overtyping the keys in the copied records with unique values, then press Enter.

PEDIT posts the copied, updated segments to the IMS database.

If the key does not require change — for example, if the original records are deleted after the copy operation — place the cursor anywhere on the line and press Enter to remove the **==>PEN** flag.

Repeating Segments

You can repeat segments or blocks of segments in their present positions, so long as the repeated segments are consistent with the structure of the IMS database. The R line command and RR block line command are used to request segment repetitions.

Repeating Single Segments

For single-segment repetitions, type the R line command at the segment to be repeated. A duplicate segment appears immediately below the original segment. It is marked as pending further data entry with the **==PEN>** flag, since the key value of the original segment has been duplicated in the copy. Overtyping the key value in the copied segment to make it unique, then press Enter.

PEDIT posts the repeated record to the IMS database. However, the new segment may not be inserted immediately adjacent to the source segment. Single-segment insertion is intelligent enough to observe the IMS insertion rules defined by your DBA for LAST, FIRST, and HERE constraints.

Repeating Multiple Segments

Block repetitions work much like block copies. After the repetition is made in the PEDIT working dataset, key values must be made unique in the following order:

- 1** Change the key for the repeated parent segment first. Press Enter.
- 2** If necessary, change the keys of any child segments that are not unique when concatenated with the new parent key. (Once you change the parent key, the keys of the children may well be unique. Press Enter.
- 3** If the ==> flag remains after all necessary key changes have been made, put the cursor anywhere on the flagged line and press Enter.

Chapter 3

Single Segment Interface (SSI)

The Single Segment Interface (SSI) feature for the StarTool FDM IMS Option lets customers browse, edit, or insert non-unique and non-keyed segments in IMS databases using IMS navigation commands. Because only one segment is accessed at a time, only one segment, and not the entire database, is locked while the segment is accessed.

The following actions are supported by the SSI feature:

- [Navigating and Viewing IMS Segments in SSI Mode](#)
- [Updating an Existing IMS Segment](#)
- [Deleting an Existing IMS Segment](#)
- [Inserting a New IMS Segment](#)

Navigating and Viewing IMS Segments in SSI Mode

The Single Segment Interface (SSI) feature is accessed from any StarTool **IMS Data Set Allocation** screen by entering Y in the **Single Access Mode** field. Once in SSI mode, use MEMLIST navigation to select the PSB and PCB for the desired segment type, then invoke PEDIT to browse specific instances of that segment type. Once in PEDIT, you can traverse the database hierarchy in conventional order, from top to bottom and right to left, using IMS commands at the **Command ==>** prompt.

MEMLIST Navigation in Single Segment Mode

Use MEMLIST navigation to select the PSB and PCB of the desired segment type prior to invoking PEDIT. SSI restricts MEMLIST navigation in only one respect: you may work with only one PCB at a time.

From the PCB MEMLIST, you set the starting database cursor position. By default, the cursor initially points to the first segment of the selected type in the database. Alternatively, you can perform a field-level search for the first segment that meets your search criteria. StarTool FDM automatically constructs the appropriate SSA.

To navigate to a desired segment in single-segment access mode:

- 4 From the **StarTool Menu of IMS Services** (panel PDSMIMS), choose the desired IMS database option:
 - **1 - IMSALLOC** — DL/1 databases
 - **2 - IMSBMP** — BMP databases

The appropriate **Data Set Allocation** prompt screen displays.

- 5 At the **Data Set Allocation** prompt screen (panels PDSIMSPD, PDSIMSPB, or PDSIMSPE), set the **Single Access Mode** field to Y. (N is the default.) The Y value places your session in single-segment access mode. For example:.

```

PDSIMSPD ----- StarTool IMS DLI Data Set Allocation prompt -----
OPTION ==>

Desired Access      ==> UPDATE      (READ or UPDATE)
Single Access Mode  ==> Y          (Y/N; Y for Single Segment Access Interface)
Retain Data Bases   ==> YES        (Yes/No, Yes will cause preallocated data
                                     bases not to be freed at the end of each
                                     EDIT or VIEW session. For dynamically
                                     allocated data bases use NO.)

Log alloc CLIST     ==>              (Name of CLIST to allocate IMS Log data set)

Allocation CLIST    ==> %ssihdam (Name of CLIST to allocate IMS data sets)
or
If not using an allocation CLIST, enter the required data set names:
PSB library         ==> 'IMSV8.PSBLIB'          IMS DD
DBD library         ==> 'IMSV8.DBDLIB'         IMS DD
RES library         ==> 'IMSV8.RESLIB'         DFSRESLB
STEPLIB lib        ==> 'IMSV8.STEPLIB'        IMSTASK
Parameter lib      ==> 'IMSV8.PARMLIB'        DFSVSAMP
DFSVSAMP Member    ==> DFSVSMDB (Member in parameter library for vsam parms)
Note: The Steplib is optional and usually contains "dyna-block" members but
      may have other "override" load module members.

```

Supply the required field values and press Enter.

- 6 At the **IMS PSB Member** prompt panel (PDSIMSP2), enter a PSB member list name, a PSB MEMLIST group name, or a PSB member selection filter option.
- 7 In the **PSB MEMLIST** panel (PDSPN07), the StarTool FDM displays the PSB members you requested. Select the PSB of interest from the list.
- 8 The PCBs associated with the selected PSB member appear in the **IMS PCB List** panel (PDSPNE5). Select the PCB that defines the segments you want to browse or edit.

```

PDSPNE5 ----- IMS PCB List for SSIPHDAM - ----- Row 1 to 2 of 2
COMMAND ==>                                     SCROLL ==> CSR

Enter an EDIT, VIEW, EXTRACT, BATCH EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng  OP -Search Argument-
S    PCB#001   TP      *COMPAT*
S    PCB#002   DB      OAKDB   AP    100    --
***** Bottom of data *****

```

Note the following requirements:

- The data type in the **TYP** column for the selected PCB must be DB.
 - You must *select* the PCB (using S in the **OPT** column), not merely expand it using the plus (+) option.
- 9 Press Enter. StarTool FDM expands the **IMS PCB List** and flags the selected PCB with an S in the **SL** column. Indented below the selected PCB is a list of all IMS segment types associated with it. Both keyed and nonkeyed segment types are included in the list.

For example:

```

PDSPNE5 ----- IMS PCB List for SSIPHDAM - ----- Row 1 to 8 of 8
COMMAND ===>                                SCROLL ===> CSR

Enter an EDIT, VIEW, EXTRACT, BATCH EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng OP -Search Argument-
PCB#001          TP      *COMPAT*          --
PCB#002          DB  S  OAKDB      AP      15      --
OAKCUST          SEG      LEV#  1  AP      3      45 --
OAKORD           SEG      LEV#  2  AP      5      20 --
OAKLITM          SEG      LEV#  3  AP      1      10 --
OAKIITM          SEG      LEV#  4  AP      4      45 --
OAKIOVR          SEG      LEV#  4  AP      4      45 --
OAKSHIP          SEG      LEV#  3  AP      1      35 --
OAKPAY           SEG      LEV#  2  AP      5      20 --
***** Bottom of data *****

```

Note the following segment information in the **IMS PCB List** panel:

- Segments are identified as data type SEG in the **TYP** column.
- The hierarchical level of the segment type appears in the **Location** column.
- Key length for the segment type appears in the **Kyl** column.
- Segment length for the segment type appears in the **Leng** column.

10 From the **IMS PCB List** panel, select *exactly one* segment type and press Enter.



NOTE The SSI feature allows you to work with only one segment type at a time. This allows other users in your organization to access other segment types in the database, even if both users access nonkeyed segments with update intent.

11 StarTool FDM refreshes the **IMS PCB List** panel. The selected segment type is flagged with an S in the **SL** column and *SELECT* in the **Data/MSG** field. All related segment types eligible for inclusion in a segment search are identified by an ALLOWED entry in the **Search Argument** column. For example:

```

PDSPNE5 ----- IMS PCB List for SSIPHDAM - ----- Row 1 to 8 of 8
COMMAND ===>                                SCROLL ===> CSR

Enter an EDIT, VIEW, EXTRACT, BATCH EXTRACT, or a StarTool subcommand :
OPT  NAME      Data/MSG TYP SL Location ATTR Kyl Leng OP -Search Argument-
PCB#001          TP      *COMPAT*          --
PCB#002          DB  S  OAKDB      AP      15      --
OAKCUST          SEG      LEV#  1  AP      3      45 ++ ALLOWED
OAKORD           SEG      LEV#  2  AP      5      20 ++ ALLOWED
OAKLITM          *SELECT* SEG  S  LEV#  3  AP      1      10 ++ ALLOWED
OAKIITM          SEG      LEV#  4  AP      4      45 --
OAKIOVR          SEG      LEV#  4  AP      4      45 --
OAKSHIP          SEG      LEV#  3  AP      1      35 --
OAKPAY           SEG      LEV#  2  AP      5      20 --
***** Bottom of data *****

```

12 If you wish to navigate segments of the selected type starting from the first such segment in the database, invoke the editor at this panel. Otherwise, go to [Step 13](#).

To invoke the editor, type E for PEDIT or V for PVIEW at the **Command ==>** prompt and press Enter. Segment navigation in the editor proceeds relative to the *first segment of the selected type* in the IMS database.

Skip to [PEDIT Navigation in Single Segment Mode](#).

- 13** If you wish to work only with segments that meet specific field-level search criteria, you must perform your search before invoking the editor. The search operation positions the database cursor to the appropriate parent segment in the database.

The following rules apply to segment searches in SSI mode:

- Only fields in ALLOWED segment types may be searched.
- Only segments of the SELECT segment type are returned.
- Fields in multiple ALLOWED segments may be searched concurrently.
- Search criteria are required for the key fields of keyed segment types.
- Search criteria may be specified by expanding segment fields in the MEMLIST with the plus (+) option in the **OPT** column, then entering search operators and arguments in the **IMS PCB List** panel.
- Search criteria may be modified by editing the search expressions shown in the **IMS Segment Selection Criteria** panel (PDSIMSS1), which is the first parameter screen displayed when you invoke the editor.

Enter your initial search criteria at the **IMS PCB List** panel and press Enter.

- 14** Invoke the editor from the **IMS PCB List** panel. To do this, type E for PEDIT or V for PVIEW at the **Command ==>** prompt and press Enter.

Segment navigation in the editor proceeds relative to the *first segment of the selected type conforming to your search criteria*. See [PEDIT Navigation in Single Segment Mode](#).

PEDIT Navigation in Single Segment Mode

In Single Segment Interface (SSI) mode, PEDIT and PVIEW support navigation from segment to segment using IMS navigation commands — such as GN (Get Next), GNU (Get Next Unique), and GNP (Get Next Within Parent) — at the **Command ==>** prompt. The editor traverses the IMS database hierarchy in conventional order, from top to bottom and left to right. Navigation proceeds initially from the parent segment selected using MEMLIST navigation prior to invoking the editor. (See [MEMLIST Navigation in Single Segment Mode](#).)

To use SSI navigation in PEDIT or PVIEW, perform the following steps.

- 1** If you have not already done so, invoke the editor by typing an E (for Edit) or a V (for View) at the **COMMAND ==>** prompt of the **IMS PCB List** screen. Press Enter.

- 2 StarTool FDM displays the **IMS Segment Selection Criteria** panel (PDSIMSS1), the first of two parameter prompt screens displayed when invoking PEDIT.

```

PDSIMSS1 - IMS segment selection criteria for EDIT, VIEW, or Extract -----
COMMAND ==>

When ready, press PF6 to continue with EDIT

FROM PCB PCB#002  DBD OAKDB Limit ==> 1000000 (max segments to retrieve)

  Use copybook   ==> YES (Yes/No; Yes prompts for copybook, ignored for EXT)
  Record select ==> NO  (Yes/No; Yes prompts for record selection options)
  Audit changes ==> NO  (Yes/No; Yes prompts for audit data set parameters)
  Alloc CLIST    ==>          (CLIST to allocate the Data Bases if needed)

Seg Name Segment search argument
OAKCUST

OAKORD

OAKLITM
ITMNUM EQ C'A6450'

```

Enter the following parameters:

- To use a copybook while browsing, editing, or inserting an IMS segment, type YES in the **Use copybook ==>** field. Otherwise, accept the default value of NO.
- To modify the search criteria for the desired segment, type YES in the **Record select ==>** field. Otherwise, accept the default value of NO.
- To audit your changes, type YES in the **Audit changes ==>** field. Otherwise, accept the default value of NO.

If you typed YES in any of these fields, press Enter. You will be prompted for the desired copybook name, segment selection criteria, or audit dataset name.

Press PF6 to continue to the next parameter screen.

- 3 The **IMS Log Allocation** panel (PDSIMSLG) displays. This is the second of two parameter prompt screens displayed when invoking PEDIT.

```

PDSIMSLG ----- IMS LOG allocation -----
COMMAND ==>

Specify the log data set (fully qualified and un-quoted)
  Data set           ==> USER001.IMSLOG.OAKDB.Y2007.M0613.T1513

Specify Primary and secondary space in tracks:
  Primary            ==> 10      value in tracks
  Secondary          ==> 60      value in tracks

```

Make any desired changes to the defaults and press Enter.

- 4 The editor displays the first child segment of the desired type that satisfies your search criteria. For example:

```
PDSPN33      PSB=SSIPHDAM,PCB=PCB#002 ,DBD=OAKDB - COLUMNS 000001 000062
COMMAND ==>                                SCROLL ==> CSR
***** ***** TOP OF DATA *****
000001 OAKLITM K A6450 F1
***** ***** BOTTOM OF DATA *****
```

If you previously typed YES as the **Use copybook ==>** prompt on the **IMS Segment Selection Criteria** panel (PDSIMSS1), the editor displays the segment in the format specified by the copybook. Otherwise, the default editor display layout is used.

- Toggle between the copybook display format and the default editor display format by entering the CB command at the **Command ==>** prompt.
 - You must be in the default editor display format in order to update, delete, or insert a record in SSI mode. After the change is made, you can view the results in copybook format by entering the CB command.
- 5 If the segment displayed is not the desired segment, enter an IMS navigation command at the editor **Command ==>** prompt to retrieve the next child segment. Navigation proceeds in conventional order, from top to bottom and left to right. The following navigation commands are supported:
- GN- Get next segment in database. In view mode, this command is equivalent to the IMS GN (Get Next) command. In edit mode, this command is equivalent to the IMS GHN (Get and Hold Next) command.
 - GNU- Get next unique segment in database. In view mode, this command is equivalent to the IMS GNU (Get Next Unique) command. In edit mode, this command is equivalent to the IMS GHNU (Get and Hold Next Unique) command.
 - GNP- Get next segment within current parent. In view mode, this command is equivalent to the IMS GNP (Get Next Within Parent) command. In edit mode, this command is equivalent to the IMS GHNP (Get and Hold Next Within Parent) command.

Respond to the editor prompt screens to view the requested segment.

Repeat until the desired segment is found.

Updating an Existing IMS Segment

- 1 Navigate to the desired segment and invoke PEDIT. (See [Navigating and Viewing IMS Segments in SSI Mode.](#))
- 2 Toggle out of copybook view (if applicable) by typing CB at the **Command ==>** prompt.
- 3 In the default PEDIT display view, overwrite the desired portion of the segment to make your updates.

- 4 Press Enter. The IMS Option issues an IMS REPL (Replace) command to make the requested change to the IMS segment.



CAUTION! Once you press Enter, the change is committed. The Cancel function key (PF3) does not roll back the change.

- 5 Press PF3 to exit PEDIT.

Deleting an Existing IMS Segment

- 1 Navigate to the desired segment and invoke PEDIT. (See [Navigating and Viewing IMS Segments in SSI Mode.](#))
- 2 Toggle out of copybook view (if applicable) by typing CB at the **Command ==>** prompt.
- 3 In the default PEDIT display view, type a D (for Delete) on the line number of the segment to be deleted. For example:

```
PDSPN33      PSB=SSIPHDAM,PCB=PCB#002 ,DBD=OAKDB - COLUMNS 000001 000062
COMMAND ==>                                     SCROLL ==> CSR
***** ***** TOP OF DATA *****
D00001 OAKLITM K A6450 F1
***** ***** BOTTOM OF DATA *****
```

- 4 Press Enter. The IMS Option issues an IMS DLET (Delete) command to delete the IMS segment.



CAUTION! Once you press Enter, the deletion is committed. The Cancel function key (PF3) does not roll back the change.

- 5 Press PF3 to exit PEDIT.

Inserting a New IMS Segment

- 1 Navigate to an existing segment that is located where you would like to insert the new segment in the IMS segment hierarchy. Then invoke PEDIT. (See [Navigating and Viewing IMS Segments in SSI Mode.](#))
- 2 Toggle out of copybook view (if applicable) by typing CB at the **Command ==>** prompt.

- In the default PEDIT display view, type an I (for Insert) on the line number of the existing segment. For example:

```
PDSPN33      PSB=SSIPHDAM,PCB=PCB#002 ,DBD=OAKDB - COLUMNS 000001 000062
COMMAND ==>                                SCROLL ==> CSR
***** ***** TOP OF DATA *****
I00001 OAKLITM K A6450 F1
***** ***** BOTTOM OF DATA *****
```

Press Enter.

- A pop-up window entitled **PEDIT Insert IMS Segment** overlays the PEDIT display panel. For example:

```
PEDIT      PSB=SSIPHDAM,PCB=PCB#002 ,DBD=OAKDB - COLUMNS 000001 000062
COMMAND ==>                                SCROLL ==> CSR
***** ***** TOP OF DATA *****
I00001 OAKLITM K A6450 F1
***** *****EsSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSN
e ----- PEDIT Insert IMS Segment ----- e
e OPTION ==> 1 e
e e e
e Enter Segment number from list below ==> e
e 1 OAKCUST e
e 2 OAKLITM e
e 3 OAKIITM e
e e e
DsSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSM
```

From the list of segment types presented in the pop-up window, enter an option number at the **Option ==>** prompt to choose the type of segment to insert. Press Enter.

- In PEDIT, the pop-up window closes and a blank line appears under the existing segment. The blank line is labeled with the name of the new segment type. Type the data for the new segment to the right of the segment name.

```
PEDIT      PSB=SSIPHDAM,PCB=PCB#002 ,DBD=OAKDB - COLUMNS 000001 000062
COMMAND ==>                                SCROLL ==> CSR
***** ***** TOP OF DATA *****
000001 OAKLITM K A6450 F1
000002 OAKCUST Enter new segment data here
***** ***** BOTTOM OF DATA *****
```

- Press Enter. The IMS Option issues and IMS ISRT (Insert) command to insert the new IMS segment. The segment is inserted at a location relative to the existing segment that is defined by the insert rules for the IMS database.



CAUTION! Once you press Enter, the insert action is committed. The Cancel function key (PF3) does not roll back the change.

- Press PF3 to exit PEDIT.

Chapter 4

Extracting and Loading IMS Data

The EXTRACT and LOAD utilities of the IMS Option let you extract IMS data from one database and use it to initially load a new IMS database. These tools are typically used to create a testing database from production IMS data.

Extracting Selected IMS Segments

To extract selected data from an IMS database, perform the following steps.

- 1 Choose a viewing and editing option from the **Menu of IMS Services**. Option **1 - IMSALLOC**, Option **2 - IMSBMP**, Option **9 - DLIDOPT**, and Option **10 - BMPDOPT**, can all be used for this purpose.
- 2 Navigate to the PSB, PCB, and segments to be extracted, then select the desired segment types and data values.



NOTE It is possible to select segments that cause errors when attempting to reload them. This can occur for a number of reasons. For example, children may become orphans in their new environment. See "[DATA/MSG Column Messages](#)" in [Appendix C, "Troubleshooting"](#), for assistance.

- 3 Type the EX (Extract) command at the **Command ==>** prompt of the **PCB List** panel and press Enter.
- 4 The **Segment Selection Criteria** panel displays. For example:

```
----- IMS segment selection criteria for EDIT, VIEW, or Extract -----  
COMMAND ==>  
  
When ready, press PF6 to continue with EXTRACT  
  
FROM PCB PCB#001  DBD GEMSDB  Limit ==> 10000  (max segments to retrieve)  
  
  Use copybook  ==> NO  (Yes/No; Yes prompts for copybook, ignored for EXT)  
  Record select ==> NO  (Yes/No; Yes prompts for record selection options)  
  Audit changes ==> NO  (Yes/No; Yes prompts for audit data set parameters)  
  Alloc CLIST   ==>      (CLIST to allocate the Data Bases if needed)  
  Seg Name      Segment search argument  
  GEM           gem01  ge p'1'
```

At this panel, do the following:

- Confirm that the correct PCB and DBD have been chosen
- Verify that the number of segments being retrieved is correct.
- Be sure that NO (the default) is entered in the **Use Copybook**, **Record Select**, and **Audit Changes** fields, and leave the **Alloc CLIST** field blank if it is shown.

- Edit the generated Segment Search Arguments (SSAs), if desired.

5 Press **PF6**. The **Extract Data Set** panel displays. For example:

```
----- Extract Data Set prompt -----
COMMAND ==>

Specify the extract data set
Data set          ==> IMS.EXTRACT
Allocation type   ==> NEW      (New, Old, or Mod)

Specify Primary and secondary space in tracks for NEW data set
Primary           ==> 4        value in tracks
Secondary         ==> 2        value in tracks

Note:  The extract file must be have a record format of VB
       and a mininum logical record length of 133
       A NEW file will be allocated with the mininum LRECL
```

Specify the extract dataset name and allocation information, then press Enter.

6 Press Enter when a message like the following displays:

```
DFS627I IMS RTM CLEANUP ( EOT ) COMPLETE FOR ST USER01 . . ,RC=0
***
```

7 When the **IMS Segment Selection Criteria** panel redisplay with the message “Extract complete”, extraction has completed successfully.

Loading an IMS Database with Extracted Data

To load an new IMS database with data previously extracted using the IMS Option EXTRACT utility, perform the following steps.

- 1 Select **Option 7 - LOAD** from the **Menu of IMS Services**.
- 2 When the **Dataset Prompt** panel displays, enter the requested IMS library allocation information and JCL job statements, then press Enter. For example:

```
----- Data Set Prompt -----
COMMAND ==>

PSBlib data set      ==> 'IMS.PSBLIB'
PSBNAME for inserts ==> PSB
DBDlib data set      ==> 'IMS.DBDLIB'
RES library          ==> 'IMS.RESLIB'
STEPLIB lib         ==> 'IMS.STEPLIB'
Paramater lib       ==> 'IMS.PROCLIB'
DFSVSAMP Member     ==> DFSVSMDB
Input data set      ==> USER01.MY.EXTRACT
IMS Logging dataset ==> 'IMS.LOG.DATETIME'
Database dynablock ==> Y      (N - for no)
DBD name override   ==> N      (Y - for yes)

JOB and JOBLIB statements for the batch job:
==> //reload job (acct#...)
==>
```

- 3 If you specified N in the **Database Dynablock** field, the IMS Option displays the **Database Information Prompt** panel.

```
----- Database Information Prompt -----
COMMAND ==>

Data base required allocation information
DDNAME      ==>
DSNAME      ==>
DISP        ==>
More?       ==> Y
```

Provide the requested allocation information and press Enter.

- 4 If you specified Y in the **DBD Name Override** field, the **Database Name Overrides** panel displays. Type the desired substitutions and press Enter.

```
----- Database Name Overrides -----
COMMAND ==>

Data base      Data base
old name       new name
>              >
>              >
>              >
>              >
```

- 5 The IMS Option then generates the JCL for the LOAD job. The IMS Option displays the generated JCL in the ISPF editor for necessary changes. For example:

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
-----
Command ==>                               Scroll ==> CSR
EDIT      USER01.SPFTEMP1.CNTL              Columns 00001 00072
***** ***** Top of Data *****
000001 //RELOAD JOB (ACCT#...)
000002 //* USING SKELETON PDS$DYNO
000003 //LDIMSD1 EXEC PGM=DFSRR00, PARM='DLI, PDSIMSRL, PSB'
000004 //STEPLIB DD DISP=SHR, DSN=IMS.STEPLIB
000005 // DD DISP=SHR, DSN=IMS.RESLIB
000006 //* DD DISP=SHR, DSN=SYS1.STARTOOL.LOAD
000007 //DFSRESLB DD DISP=SHR, DSN=IMS.RESLIB
000008 //IMS DD DISP=SHR, DSN=IMS.PSBLIB
000009 // DD DISP=SHR, DSN=IMS.DBDLIB
000010 //IEFRDER DD DISP=SHR, DSN=IMS.LOG.DATETIME
000011 //DFSVSAMP DD DISP=SHR, DSN=IMS.PROCLIB(DFSVSAMP)
000012 //PRINTOUT DD SYSOUT=*
000013 //SYSPRINT DD SYSOUT=*
000014 //SYSUDUMP DD SYSOUT=*
000015 //INDATA DD DISP=SHR, DSN=USER280.USER263.MY.EXTARCT
000016 //SYSPRINT DD SYSOUT=*
***** ***** Bottom of Data *****
```

In the example, the third STEPLIB DD statement must be replaced with the name of the actual StarTool FDM load library at your installation.

Make any needed changes, then save and submit the job.

Chapter 5

Converting DBD Source to PSB Source

Option **8 - CONVERT** on the **Menu of IMS Services** invokes the IMS Option CONVERT utility. Use this utility to convert DBD source to PSB source for multiple DBDs at once.

Fill in the information on the **DBD to PSB Prompt** panel.

```
----- DBD to PSB Prompt -----
COMMAND ==>

PSB source dataset ==> user01.test.psbsrc
PSB Member        ==> tempxxx
DBD source dataset ==> user01.test.dbdsrc
DBD Member        ==> gemsdb

JOB and JOBLIB statements for the batch job:
==> //RELOAD JOB (ACCT#...)
==>
==>
==>
```

The generated JCL displays in the ISPF editor so you can edit and submit the job.

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
EDIT      USER298.SPFTMP1.CNTL          Columns 00001 00072
Command ==>                               Scroll ==> PAGE
***** Top of Data *****
000001 //RELOAD JOB (ACCT#...)
000002 //* USING SKELETON PDS$ID2P
000003 //CONVERT1 EXEC PGM=PDSIMD2P
000004 //*STEPLIB DD DISP=SHR,DSN=SYS1.STARTOOL.LOAD
000005 //PSBOUT DD DISP=SHR,DSN=USER263.TEST.PSBSRC(TEMPXXX)
000006 //DBDSRC DD DISP=SHR,DSN=USER263.TEST.DBDSRC(GEMSDB)
000007 //PRINTOUT DD SYSOUT=*
000008 //SYSUDUMP DD SYSOUT=*
000009 //SYSPRINT DD SYSOUT=*
***** Bottom of Data *****
```

After the job completes, enter the PSB source member to the IMS PSB generation utility to verify the syntax. Then enter the generated PSB to the IBM ACB generation utility to verify the PSB/DBD references.

Installing and Configuring the IMS Option

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Installing and Licensing the IMS Option

The underlying code for the IMS Option is installed automatically with the base product for StarTool FDM. However, activating this feature requires an additional license. Contact your sales representative or Micro Focus Customer Support to obtain a license key.

Optional license keys may be applied to an existing installation without reinstalling code. This is done using Micro Focus's licensing software, SER10TY. For instructions, refer to the *SER10TY User's Guide*, which is included on the distribution media with StarTool FDM.

Defining Applications to IMS for BMP Processing

If you plan to use BMP processing — Option **10** (BMPOPT) on the **Menu of IMS Services** — certain IMS Option application programs must be defined to each IMS subsystem you plan to access. This is done using the APPLCTN macro.

- **For BMP access with update intent**, define applications SERENA01 through SERENA16.
- **For BMP access with read-only intent**, define applications SERENG01 through SERENG16.
- **Include positional parameter DOPT** on all defined applications.
- **Include parameter PGMTYPE=BATCH** on all defined applications.

Library Allocation CLISTs

Library allocation for the IMS Option is simplified by using a CLIST or REXX EXEC. The name of this CLIST may be supplied instead of individual library data set names at any

allocation or editing prompt in the IMS Option. CLIST allocations take precedence over PDS#OPT4 default allocations if both are configured.

CLIST Sample Members

Sample IMS library allocation CLISTs are provided in library *somnode*.PDSE*vr*m.CLIST. These members are:

- IMSBMPAL — Allocates the required IMS data sets for BMP processing. IMSBMPAL must be customized for your installation.
- IMSALLOC — Allocates the required IMS data sets for DL/I processing. IMSALLOC must be customized for your installation.
- IMSLOGAL — Allocates an IMS log data set. IMSLOGAL should be used as distributed if its data set naming conventions meet your installation standards.



NOTE For DL/1 processing, separate CLISTs or REXX EXECs are required for database library allocation and log library allocation. BMP processing does not require a separate allocation CLIST for log libraries.

CLIST Coding Conventions

The following requirements should be noted during CLIST customization for IMS:

- **DD statements must appear in a specific order** if you allocate IMS libraries using a CLIST or REXX EXEC. The first DD statement must allocate the desired IMS PSBLIB. The second DD statement must allocate the desired IMS DBDLIB.

For example:

```
//IMS DD DSN=ims.psblib,DISP=SHR    used to build MEMLIST for Option 1,2
//    DD DSN=ims.dbdlib,DISP=SHR    used to build MEMLIST for Option 9,10
```

This allocation order is assumed when the IMS Option builds its PSB and DBD MEMLISTs.

- **If you use IMS Version 9 and BMP**, you may need to add the following JCL to allocation CLIST IMSBMPAL:

```
ALLOC FI(IMSDALIB) DA('IMSD113.IMSDALIB') SHR
```

IMS uses the IMSDALIB dataset to determine the dynamic allocation of RECON datasets.

Dynamic Library Allocation

Customize PDS#OPT4, the configuration options module of StarTool FDM, if you plan to use the dynamic PSB function of IMS. Library allocation for the dynamic PSB generation feature is simplified by customization.

Creating PDS#OPT4

A sample source code member, *SAMPOPT4*, is provided as a starting point for customization in library *somnode*.PDSE*vr*m.ASSEMBLE. After customization, the assembled version of this module, *PDS#OPT4*, is placed in your production load library.



CAUTION! Take care not to overwrite prior customizations of StarTool FDM when adding IMS features to PDS#OPT4.

General information about customizing and assembling PDS#OPT4 appears in the *StarTool FDM Installation Guide*. IMS-specific customization steps for PDS#OPT4 are discussed in this section.

#INITIAL Macro Parameters for Dynamic PSB Processing**#INITIAL Parameters**

The #INITIAL macro in PDS#OPT4 takes certain IMS-specific parameters that specify default values for dynamic PSB processing. These defaults appear in the library allocation panels (Options **9** and **10** on the **Menu of IMS Services**) displayed by the IMS Option. These parameters are:

Parameter	Description	Data Type
IACBLIB	Dataset name of dynamic ASBLIB where dynamically generated PSBs should reside.	32-byte character
IASMNAME	Name of assembler to use when generating dynamic PSBs from DCBs. Supplied to PSBGEN.	8-byte character
ILNKEDN	Name of link-editor to use when generating dynamic PSBs from DCBs. Supplied to PSBGEN.	8-byte character
IMACLIB	Dataset name of IMS macro library used when assembling and link-editing dynamic PSBs generated from DCBs. Supplied to PSBGEN.	32-byte character
ISOUT	SYSOUT class for IMS PCBGEN and ACBGEN output. Should be a valid JES HOLD class.	1-byte character

Code values for these parameters as shown in the example below. Continuations are marked in column 72 and resume beginning in column 16 of the next line.

```

PDS#OPT4 TITLE 'StarTool INITIALIZATION DEFAULTS CSECT'
PDS#OPT4 CSECT ,
START    DC    CL8'PDS#OPT4'
          DC    CL16' &SYSDATE &SYSTEMTIME '
*-----1-----2-----3-----4-----5-----6-----7-
          #INITIAL $TYPEACF=CALL,                X
          #CONGLBL=TRANSLAT+ALIASINF,           X
          @DSAT=DSAT,                            X
          @DVOL=DVOL,                            X
          @HELP=HEL,                             X
          @EDIT=%VSAMFED,                        X
          SLCSEL=EDIT,                           X
          IACBLIB=IMS.ACBLIB, // *IMS DYNAMIC ACBLIB NAME *X
          IASMNAME=ASMA90, // *IMS ASSEMBLER FOR ACB-PSB GEN *X
          ILNKEDN=HEWL, // *IMS LINK EDIT FOR ACB-PSB GEN *X
          IMACLIB=IMS.MACLIB, // *IMS PSB-ACB MACLIB *X
          ISOUT=H // *IMS SYSOUT CLASS FOR ACB-PSB GEN*

```

The default values assigned to these parameters may be overridden by the user at runtime. Overriding values may be supplied by manual data entry at the panel or by naming a CLIST or REXX EXEC.

Appendix B

User Exits

StarTool FDM provides two user exits for use with the IMS Option. Exit PDSIMSEX may be implemented on its own for customized library allocation and security processing. PDSIMSPX requires the prior installation of PDSIMSEX.

Library Allocation and Authorization Exit PDSIMSEX	85
Startup Exit PDSIMSPX	88

Library Allocation and Authorization Exit PDSIMSEX

Both static and dynamic allocation of IMS system libraries can be more tightly controlled by customizing a user exit.

A sample library allocation exit with default values, SAMPIMSE, is provided in installation source code library *somnode.PDSEVRM.ASSEMBLE*. The assembled load module created from this source member is PDSIMSEX. The default version of PDSIMSEX resides in installation load library *somnode.PDSEVRM.LOAD*.

Exit PDSIMSEX controls IMS database library access based on TSO user ID, subsystem ID, and the type of access requested (READ/UPDATE, DLI/BMP). The exit either allocates the required IMS libraries directly, returns a CLIST or REXX routine that will allocate the correct libraries, or rejects the request.

PDSIMSEX Parameters

On entry to the PDSIMSEX exit, register 1 points to a parameter list consisting of seven fullword parameters. The parameter list follows:

Parm #	Parameter Description
1	Address of a half word code: 0 - Call for a READ authorization and allocation 4 - Call for an UPDATE authorization and allocation 8 - Call for a LOG allocation C - Call for a BMP Read authorization and allocation 10 - Call for a BMP Update authorization and allocation
2	Address of an 8-byte area to return the name of an allocation CLIST or REXX procedure, if required.
3	Address of a 4-byte IMS subsystem name requested for allocation.
4	Address of a 7-byte TSO user id.
5	Address of a message area in case of failure – 80 bytes.

Parm #	Parameter Description
6	Reserved.
7	Address for PDS#OPT4 parameter overrides for five additional parameters: <ul style="list-style-type: none"> ■ address of the assembler name to be used for PSB generation. ■ address of the linkage editor name to be used with dynamic PSBs. ■ address of the dynamic ACBLIB name to be used for BMPs. ■ address of the IMS macro library name to be used. ■ address of the SYSOUT class to be used for ACBGEN and PSBGEN print output (this should be a valid JES hold class).

The exit returns the following output:

```
REGISTER 15 RETURN CODE :
      0 TO CONTINUE , ALLOCATION COMPLETE
      4 TO CONTINUE USING RETURNED CLIST/REXX
      8 NOT AUTHORIZED
     12 ALLOCATION FAILED MSG IN AREA PROVIDED - PARM 5
```

PDSIMSEX Execution Environment

The registers on entry to PDSIMSEX are:

- R0: Undefined
- R1: 7-word parameter list described above (plus 5 address parameter pointed to by the 7th parameter)
- R2-R12: Undefined
- R13: Standard 72-byte save area
- R14: Return address
- R15: Entry address

The registers on exit from PDSIMSEX must be:

- R0: Undefined
- R1-R14: Unchanged
- R15: Return codes

Customizing Exit PDSIMSEX

To customize this exit, perform the following steps:

- 1 Back up the original source (SAMPIMSE) and load (PDSIMSEX) members.
- 2 Copy source member SAMPIMSE to the separate library where your customized StarTool FDM source members reside.
- 3 Customize the assembly language code in SAMPIMSE as needed for your installation. Instructions are included in the source member.

- 4 Assemble and link-edit SAMPIMSE as load member PDSIMSEX and place it in the separate library where your customized load members reside.
- 5 Copy the assembled load member PDSIMSEX to library *somnode*. PDSE *vrm*. LOAD or to the production ISPLLIB library you use to execute StarTool FDM.

Authorization and Allocation Prompt Panel

If you implement the PDSIMSEX installation allocation and authorization exit, the IMS Option displays the **IMS Authorization and Allocation Prompt** panel whenever the user selects Option **1**, Option **2**, Option **9**, or Option **10** from the **Menu of IMS Services**. This alternate allocation prompt panel does not require library names to be supplied by the user. Instead, libraries are allocated by the exit. .

```

----- StarTool IMS authorization and allocation prompt -----
OPTION ==>

IMS subsystem name ==> IMS1      (Name used by installation exit)
Desired Access      ==> UPDATE   (READ or UPDATE)
Single Access Mode  ==> N       (Y/N; Y for Single Segment Access Interface)
Retain Databases    ==> NO      (Yes/No. Yes will cause preallocated data
                                bases not to be freed at the end of each
                                EDIT or VIEW session. For dynamically
                                allocated databases, use NO.)

```

IMS Subsystem	Name of the IMS subsystem managing the desired databases. Exit PDSIMSEX allocates the IMS system datasets (PSBLIB, DBDLIB, RESLIB, logs) required by the named subsystem.
Desired Access	<ul style="list-style-type: none"> ■ READ– Read-only access as defined by selected PCBs. PCB MEMLIST is populated with read-only PCBs. ■ UPDATE– Update access as defined by selected PCBs. PCB MEMLIST is populated with update-intent PCBs. <p>If a selected PCB does not allow updates to the desired field in a segment, updates will not be permitted to that field, regardless of the access level chosen here.</p>
Single Access Mode	<ul style="list-style-type: none"> ■ N– No, do not use Single-Segment Interface (SSI) mode (default). Choose this option for regular multisegment IMS database navigation. ■ Y– Yes, invoke the Single-Segment Interface (SSI). Choose this option for single-segment access mode. (See Chapter 3, "Single Segment Interface (SSI)" for further information.)
Retain Databases	<ul style="list-style-type: none"> ■ NO– Datasets are automatically deallocated when you exit the editor (default). ■ YES– Dataset allocations are retained when you exit PVIEW or PEDIT and must be manually deallocated. Unless deallocated, dataset enqueues last as long as you are logged on.

When you press ENTER on this panel, PDSIMSEX receives the information and either takes responsibility for the allocations or returns the name of a CLIST to execute. The IMS Option then displays the IMS PSB member prompt panel.

Startup Exit PDSIMSPX

Installing the IMS Start Parameters Exit

The StarTool FDM IMS Option executes with default parameter values on initial installation. The sample source code exit PDSIMSPX in the *somnode.PDSEvrn.ASSEMBLE* library contains these default values.

If you wish to customize your own exit, first back up the default exit PDSIMSPX that is shipped in *somnode.PDSEvrn.LOAD*, then extend the sample source code from *somnode.PDSEvrn.ASSEMBLE* and assemble and link edit it into one of the ISPLLIB libraries that you use to execute StarTool FDM. You may do this any time after initial product installation.

PDSIMSPX specifies all but the first three parameters that StarTool FDM passes to IMS when it attaches DFSRRC00 to search a DLI database. When StarTool FDM calls DFSRRC00, it provides the first three parameters, the program name, and the PSB name, and then appends any parameter string provided by the exit. The exit cannot change any of the first three parameters.



IMPORTANT! PDSIMSPX requires the prior installation of the allocation and authorization exit PDSIMSEX.

PDSIMSPX Parameters

On entry to PDSIMSPX, register 1 points to a parameter list that consists of nine fullword parameters (the first eight of which are pointers; the last parameter is the length). The high order bit is turned on in the last address. The parameter list points to the following:

+0 @USERID	7-character userid of the caller
+4 @PSBNAME	8-character PSB= value (BATCH PSB NAME)
+8 @REGTYPE	3-character IMS region type (DL/1 or BMP)
+C @SSID	4-character SSID of IMS
+10 @AGNNAME	8-character AGN= value (RACF APPL GROUP NAME) previously entered by the user
+14 @NBAPARM	4-character NBA= value (FAST PATH BUFFERS)
+18 @OBAPARM	4-character OBA= value (FAST PATH OVERFLOW BUFFERS)
+1C @PARMBUF	200-byte area for the exit to return its parameter string
+20 FWLL	Fullword length set by the exit to indicate the length of the returned parameter string

The exit returns the following output:

- Return code 0 or 4 in register 15
- For return code 4, a string of IMS parameters 4 through *n* in the buffer pointed to by @PARMBUF and the length of the string in the word pointed to by FWLL

If the exit returns a code of 0, StarTool FDM proceeds with its normal process, including any parameters specified on the screens used to build the parameters, like the AGN parameter or the NBA parameter.

If the exit returns a code of 4, the exit provides an IMS start parameter string after the third positional IMS parameter. StarTool FDM appends this string to the Type, SSID and PSB parameters to override the IMS defaults. The exit ensures that the parameter list is complete and accurate since StarTool FDM does no validation or checking. Account for omitted parameters with commas.

Execution Environment

The registers on entry to PDSIMSPX are:

- R0:Undefined
- R1:9-word parameter list described above
- R2-R12:Undefined
- R13:Standard 72-byte save area
- R14:Return address
- R15:Entry address

The registers on exit from PDSIMSPX must be:

- R0:Undefined
- R1-R14:Unchanged
- R15:Return code
 - 0 = Use FDM default IMS parameters
 - 4 = Use the returned IMS parameter string

PDSIMSPX is called and must return in the following execution environment:

- PSW Key:8
- State:Problem
- Locks:None
- Authorization:Not APF
- Cross Memory Mode:PASN=HASN=SASN
- AMODE:31
- ASC Mode:Primary
- Dispatchable Unit Mode:Task

PDSIMSPX Code Sample

```

          TITLE 'IMS PARAMETER OVERRIDE EXIT'
*****
*
* ROUTINE CALLER
*
```

```

*
* ON ENTRY R1 WILL POINT TO A PARM LIST - DESCRIPTION FOLLOWS
*       R13 SAVE AREA ADDRESS
*       R14 RETURN ADDRESS
*       R15 ENTRY ADDRESS
*
* PARS:
*   PARM #1 ADDRESS OF PARMLIST
*   EXITPLST
*   @USERID   >>> USERID   CL7           +0
*   @PSBNAME  >>> PSBNAME  CL8           +4
*   @REGTYPE  >>> REGTYPE  CL3 (DLI/BMP)  +8
*   @SSID     >>> SSID     CL4           +12
*   @AGNNAME  >>> AGNNAME  CL8           +16
*   @NBAPARM  >>> NBAPARM  CL4           +20
*   @OBAPARM  >>> OBAPARM  CL4           +24
*   @PARMBUF  >>> PARMBUFF CL200  EXIT OVERRIDE BUFFER +28
*   FWLL      >>> ACTUAL LENGTH OF PARM EXTENSION +32
*
* ON RETURN R0-R14 RESTORED
*       R15   RETURN CODE   0 = IGNORE EXIT
*                               4 = USE EXIT OVERRIDES
*
*       DATA AREA AT THE ADDRESS IN "@PARMBUF" MAY BE
*       CHANGED TO REFLECT ADDITIONAL PARMS TO BE PASSED
*       TO THE IMS INITIAIZATION PROGRAM.
*
*       USE UP TO THE LENGTH PASSED IN FWLL AND CHANGE
*       "FWLL" TO REFLECT THE NUMBER OF BYTES PLACED IN
*       THE BUFFER.
*
*       THE FORMAT OF THE DATA MUST BE COMMA DELIMITED
*       VALUES WITHOUT IMBEDDED SPACES.  IT MUST START
*       WITH 3 LEADING COMMA TO REFLECT THE FIELDS THAT
*       CANNOT BE OVERRIDDEN/CHANGED.
*
*****
* CHANGE HISTORY
* 2006-JUN-06 GAH REORGANIZED THE CODE
* 2002-OCT-07 DHS NEW MODULE
*****
* LOCAL MACROS FOR ENTRY AND EXIT PROCESSING:
*****
*
*       MACRO
&N   RBEGIN  &NAME,&BASE=R12,&SAVE=SAVEAREA,          X
        &SAB=,&SUBPOOL=0
*
* -----
* THIS MACRO IS USED ENTER THE "EXIT" PROGRAM AND SAVE REGISTERS.
* IT ALSO ACQUIRES A WORK AREA AND INITILIZES IT.
* R0 AND R1 WILL CONTAIN THERE INITIAL VALUE AS OF ENTRY.
* -----

```

```

*
      LCLA      &L
      LCLA      &M
      AIF      ('&SYSLIST(0)' EQ '').ERROR
&N      CSECT
      AIF      ('&NAME' EQ '').LABEL
&L      SETA      ((K'&NAME)/2)*2+4
&M      SETA      K'&NAME
      B        &L.(0,15)
      DC        AL1(&M)
      DC        C&NAME
      AGO        .OK
.LABEL  ANOP
&M      SETA      K'&N
&L      SETA      ((K'&N+2)/2)*2+4
      B        &L.(0,15)
      DC        AL1(&M)
      DC        C'&N'
.OK     ANOP
R0      EQU      0
R1      EQU      1
R2      EQU      2
R3      EQU      3
R4      EQU      4
R5      EQU      5
R6      EQU      6
R7      EQU      7
R8      EQU      8
R9      EQU      9
R10     EQU      10
R11     EQU      11
R12     EQU      12
R13     EQU      13
R14     EQU      14
R15     EQU      15
*      SET UP ADDRESSABILITY, SAVE AREA, AND SAVE AREA CHAINING.
      STM      R14,R12,12(R13)
      LR      &BASE,R15
      USING   &N,&BASE
      LA      &BASE,0(&BASE)  CLEAR HIGH ORDER BYTE FOR XA
      LA      R0,&SAB  DO GETMAIN FOR SAVE AREA
      STORAGE OBTAIN,LENGTH=(R0),SP=&SUBPOOL
      ST      R1,8(R13)  CHAIN NEW TO CALLER'S SAVEAREA
      XC      0(&SAB,R1),0(R1)  CLEAR STORAGE (UP TO 255 BYTES)
      ST      R0,0(,R1)  SAVE LENGTH IN SAVE AREA
      ST      R13,4(R1)  CHAIN SAVE AREAS
      LM      R0,R1,20(R13)  RESTORE R0-R1
      L      R13,8(R13)  LOAD R13
      MEXIT
*
.ERROR  MNOTE      12,'LABEL IS REQUIRED WITH THIS MACRO.'
      MEND
*
*
      MACRO
&N      EXITX

```

```
*                               -----IMS ID
*
*****
*** EQUATES, CONSTANTS, ETC
WORKAREA DSECT                POSITIONAL TO WORKSZ
SAVEAREA DS    18F           SAVE AREA
WORKSZ EQU    *-WORKAREA
END
```


Troubleshooting

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Collecting Diagnostic Information for Support

If you require assistance to resolve a problem with the StarTool FDM IMS Option, collect the following data for Micro Focus Customer Support:

- A copy of messages written to the SYSLOG by IMS for the relevant TSO user ID.
- A list of load modules for all PSBs and DBDs involved. For logical databases and databases with logical children, there should be more than one DBD.
- The source statements for all PSBs and DBDs involved.
- A capture of the screen output for incorrect data or, for an ABEND, the registers and PSW at time of ABEND.
- If it appears that there is a loop, take a system console dump using the following commands:

```
DUMP COMM=(DUMP OF tso-user-id)
xx,SDATA=(PSA,TRT,RGN,SUM),END
```

where *xx* is the outstanding WTOR for this dump.

DATA/MSG Column Messages

When you select a PSB, PCB, or DBD from a MEMLIST in the IMS Option, an error message may display in the **Data/MSG** column if the select operation fails. The most common such messages are described below.

- *NO SA* — No search argument was supplied, although an SSA is required for the requested action. This message displays if a search argument is entered for a nonkeyed field in a segment with no key field search arguments. As entered, this request would require a full database scan, but the IMS Option assumes a full database scan is not intended in an interactive environment. You must either add a search argument for a key field in the segment or remove the search argument from the nonkeyed field in the segment. Then retry your request.

Alternatively, a search field name may be misspelled, an operator may be invalid, or the data type of the search argument may not be compatible with the data type of the searched field. Correct the error and retry your request.

- *NOFLDS — Displays if you attempt to expand a segment for which no viewable or editable fields are defined. May also display if you expand a segment without selecting its associated PCB first. The PCB must be selected with the S command in the **OPT** column, not merely expanded with the plus (+) command, before its subordinate segments can be expanded or selected. Select the PCB and retry your request.
- *NOTHERE — The PCB for the expanded or selected segment has not itself been selected. The PCB must be selected with the S command in the **OPT** column, not merely expanded with the plus (+) command, before its subordinate segments can be expanded or selected. Select the PCB and retry your request.
- *ERRnnn — A file processing error occurred. Look up error code nnn in “*ERR Error Codes” for more diagnostic information.

*ERR Error Codes

When you select a PCB on the **IMS PCB List** panel (PDSPNE5), an error code may display in the **Data/MSG** column if the select operation fails. The format of the column message is *ERR followed by a three-digit error code.

The first digit of the error code indicates the general action being performed when the error occurred. The last two digits of the error code describe the specific error.

100 Series	DBDLIB Allocation Errors
112	DBDLIB not found
116	Other error allocating DBDLIB
200 Series	Errors Loading DBD for Analysis
200	Error in OPEN macro for DBDLIB DCB
204	DBD member name not found
208	Error issuing BLDL macro for member
300 Series	Storage Problems
300	Error in GETMAIN macro
400 Series	DBD Deletion Errors
400	Error issuing MVS DELETE macro to remove DBD from storage
420	DD name error
424	Error loading external DBD
428	Recursive DBD reference
432	Too many DBDs
500 Series	Errors Building DBD Map

504	Internal error in PSB map, DBD map, or Combined PSB/DBD map
508	An invalid PCB number was detected (less than 0 or greater than maximum
512	Segment in PCB not found in DBD
516	Field in PCB not found in DBD
520	Parent segment not found when calculating concatenated key length for child segment
524	Error finding secondary index field
528	Too many external DBDs to map
532	StarTool FDM could not load a second-level or lower-level DBD
536	Failure in OPEN macro when loading lower-level DBDs
540	Failure in BLDL macro when loading lower-level DBDs
544	Failure in LOAD macro when loading lower-level DBDs
548	Logical child source segment not found in specified DBD map
600 Series	Other Errors
600	No segments found in DBD
620	Recovery failure

Library Is Unusable

StarTool FDM attempts to allocate and use the IMS libraries specified by the user. These libraries may be specified using various IMS Option allocation panels, an allocation CLIST, or in customized user exits.

Errors may arise when dataset names are incorrect or misspelled. In some of these cases, the error will be reported via TSO or system messages. These should be examined first.

In other cases, the StarTool FDM IMS Option will detect errors and will not attempt to complete the erroneous request. In this case, the user may see the following message:

```
LIBRARY IS UNUSABLE, REASON:nn
```

The *nn* field contains a return code that represents one of the following error reasons:

01	The IMSTASK DD statement was still open from a prior request. (This is defined as STEPLIB on the StarTool IMS DL/1 Data Set Allocation prompt panel, PDSIMSPD.)
02	The dataset name provided for the PSB library is invalid or not catalogued.
03	The dataset name provided for the PSB library appears to be a VSAM or direct access file. (This may indicate that a database name was entered in this field by accident.)
04	The dataset name provided for the PSB library is not a PDS or PDSE.
05	The dataset name provided for the PSB library is not a load library (RECFM is not format U).
06	The dataset name provided for the DBD library is invalid or not catalogued.

07	The dataset name provided for the DBD library appears to be a VSAM or direct access file. (This may indicate that a database name was entered in this field by accident.
08	The dataset name provided for the DBD library is not a PDS or PDSE.
09	The dataset name provided for the DBD library is not a load library (RECFM is not format U).
10	The dataset name for DFSRESLB is invalid or not catalogued
11	The dataset name provided for the IMS task library (STEPLIB parameter) is invalid or not catalogued.
12	The dataset name provided for the VSAM parameter library (DFSVSAMP) is invalid or not catalogued.
13	Error opening a file. z/OS will normally issue an IEC-prefix message to identify the dataset in error.

In some of these cases, ending the StarTool FDM session, then logging off and logging back on to TSO, may be necessary to clear an error condition.

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