



The Mainframe Software Partner
For The Next 50 Years

File-AID *for IMS/CICS* and File-AID *for IMS/DC*

Reference

Release 16.03

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Introduction

This is a detailed reference manual for users of File-AID *for IMS*. This manual provides the information necessary to fully use the features of File-AID *for IMS* 16.3. This manual is not intended as a learning tool for first time users.

Manual Organization

This manual contains the following chapters and appendixes:

Chapter 1, “Overview” provides an overview of File-AID *for IMS* including system requirements, invoking and terminating the product, screen formats, and command entries.

Chapter 2, “Browse and Edit Data Base” describes File-AID *for IMS* Options 1 and 2, browse and edit functions.

Chapter 3, “Batch Audit Trail Processing” describes File-AID *for IMS* batch audit trail processing.

Chapter 4, “Maintaining File-AID for IMS” addresses maintenance issues concerning File-AID *for IMS*.

Chapter 5, “File-AID for IMS/ISPF Selection Criteria” describes File-AID *for IMS/ISPF*, Option 6.

Chapter 6, “File-AID for IMS/ISPF Segment/Layout Cross Reference” describes File-AID *for IMS/ISPF*, Option 7.

Appendix A, “Command Summary” provides a summary of File-AID *for IMS* commands.

Although File-AID *for IMS* supports both COBOL and PL/I programming languages, much of its processing is unaffected by the language used. Therefore, most of the text in this reference manual is presented in a language-independent manner. In those instances where processing is affected by the language used, the COBOL perspective is presented first under its own subheading, followed by the PL/I perspective. The word COBOL or PL/I appears on many File-AID *for IMS* screens and reports, depending on the language used. This reference manual uses COBOL as a default.

Notation Rules

This manual uses the following notation rules:

- Screen, field, and column names appear with initial caps. For example:
 - ...on the Extract specification screen
 - ...in the Region Type field
 - ...in the Line Cmd column
- Primary command names appear in all uppercase. For example, Enter the FIELD command to...

Reading the Syntax Diagrams

Syntax diagrams define primary command syntax.

A **parameter** is either a keyword or a variable.

- All KEYWORDS are shown in uppercase characters and must be spelled exactly as shown. You cannot substitute another value. If any part of a KEYWORD is shown in lowercase characters, that part is optional.
- Variables are user-specified values and are printed in lowercase italics. For example, *dataset-name* indicates you are to substitute a value.

The syntax for commands is described in diagrams that help you visualize parameter use. The following example shows a command and a parameter:

▶▶—COMMAND—parameter—▶▶

Read the diagrams from left to right and from top to bottom. These symbols help you follow the path of the syntax:

- ▶▶ indicates the beginning of a statement.
- indicates the statement is continued on the next line.
- ▶ indicates the statement is continued from the previous line.
- ▶▶ indicates the end of a statement.

Required parameters appear on the horizontal line (the main path). Optional parameters appear below the main path. Default parameters appear above the main path and are optional. The command will execute the same whether the default parameter is included or not.

▶▶—COMMAND—REQUIRED-KEYWORD—
 ┌ DEFAULT-KEYWORD ─┐
 └──────────────────┘
 ┌ optional-variable ─┐
 └──────────────────┘
 ▶▶

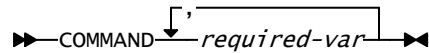
Vertically stacked parameters are mutually exclusive. If you must choose a parameter, one item of the stack appears on the main path. If the parameters are optional, the entire stack appears below the main path. If a parameter in a stack is the default, it appears above the main path.

▶▶—COMMAND—
 ┌ DEFAULT-KEYWORD1 ─┐
 ├───┤
 └ OPTIONAL-KEYWORD2 ─┘
 ├───┤
 └ OPTIONAL-KEYWORD3 ─┘
 ┌ default-var1 ─┐
 ├───┤
 └ optional-var2 ─┘
 ├───┤
 └ optional-var3 ─┘
 ▶▶

If the same parameters are used with several commands, their syntax may be documented in a separate diagram. In the command syntax, these common parameters are indicated with separators before and after the parameter name.

▶▶—COMMAND—| common-parameter|—▶▶

An arrow returning to the left indicates a repeatable item. If the arrow contains a comma, separate the repeated items with a comma.



Related Publications

The following File-AID *for IMS* documents are available from Compuware.

- *File-AID for IMS/ISPF Reference*: This manual details the information necessary to fully use the features of File-AID *for IMS/ISPF*.
- *File-AID Single Install Image Installation and Configuration Guide*: This manual provides a step-by-step description of how to install all File-AID products, including File-AID *for IMS/ISPF*, File-AID *for IMS/CICS*, and File-AID *for IMS/DC*, on your system. It is intended for database administrators and the systems group responsible for File-AID at your installation.
- *File-AID Quick Configuration Guide*: Provides an abbreviated set of steps to quickly configure File-AID products, including File-AID *for IMS*.
- *File-AID for IMS/CICS and File-AID for IMS/DC Reference*: This manual details the information necessary to fully use the features of File-AID *for IMS/CICS* and File-AID *for IMS/DC*.
- *File-AID for IMS/FLEX Reference*: This manual details the information necessary to fully use the features of File-AID *for IMS/FLEX*.
- *File-AID for IMS Reference Summary*: This reference provides a summary of the File-AID *for IMS* options and commands. It is intended for any user of File-AID *for IMS*.
- *Compuware Installer Mainframe Products SMP/E Installation Guide*: Instructions on how to perform the SMP/E installation of Compuware mainframe products, including File-AID *for IMS*.

Online Documentation

The File-AID *for IMS* product installation package does not include the product documentation. Access the File-AID *for IMS* documentation from the Compuware Go customer support website at <http://go.compuware.com> in the following electronic formats:

- Release Notes in HTML format
- Product manuals in PDF format
- Adobe PDF index file (PDX file)
- Product manuals in HTML format.

The product documentation is available for viewing or downloading:

- View PDF files with the free Adobe Reader, available at <http://www.adobe.com>.
- View HTML files with any standard web browser.

Getting Help

At Compuware, we strive to make our products and documentation the best in the industry. Feedback from our customers helps us to maintain our quality standards.

If problems arise, consult your manual or the File-AID *for IMS* customer support representative at your site. If problems persist, please obtain the following information before contacting Compuware. This information helps us to efficiently determine the cause of the problem.

1. Obtain your client number and write it in the space below.

Client No. _____

2. If you are getting an error message from File-AID *for IMS*, press **PF1** for an extended explanation of the error.
3. If you are getting a batch error message from File-AID *for IMS*, keep the JCL and output.
4. Enter the VIEW command from any COMMAND line within the product and print the configuration report. Refer to the description of the "View" command in the primary commands chapter of the *File-AID for IMS/ISPF Reference* manual for more information.
5. Determine the product function being used and the sequence of events leading up to the problem.
6. If files are involved, determine the file characteristics.
7. Record any ISPF/PDF error messages or operating system messages. If an abend occurs, record the abend or screen information.
8. Determine the versions of current operating system components that may have an impact on the problem.

Compuware provides a variety of support resources to make it easy for you to find the information you need.

Compuware Go Customer Support Website

You can access online information for Compuware products via our Compuware Go customer support website at <http://go.compuware.com>.

Compuware Go provides access to critical information about your Compuware products. You can review frequently asked questions, read or download documentation, access product fixes, or e-mail your questions or comments. The first time you access Compuware Go, you are required to register and obtain a password. Registration is free.

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- All other countries: Contact your local Compuware office. Contact information is available at <http://go.compuware.com>.

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Chapter 1.

Overview

File-AID *for IMS* is an interactive, full-screen system designed for the application development and maintenance environment that enables you to edit, browse, extract, and load IMS databases. File-AID *for IMS* significantly reduces the time required to create and maintain IMS test databases, view database information, and perform production troubleshooting activities.

The File-AID *for IMS* system consists of the following products:

- File-AID *for IMS/ISPF* runs as a dialog under TSO/ISPF and can access both online and offline IMS databases.
- File-AID *for IMS/DC* runs as a non-conversational MPP under IMS/DC and can access IMS databases that are allocated online to IMS.
- File-AID *for IMS/CICS* runs as a pseudo-conversational transaction under CICS and can access IMS databases that are allocated online to CICS.
- File-AID *for IMS/FLEX* allows larger amounts of updates and prints to take place in the background with input values supplied in a file.
- File-AID *for IMS/Fast Path* provides access to IMS Fast Path databases.

File-AID *for IMS* Key Features

File-AID *for IMS/CICS* and File-AID *for IMS/DC* contain the following features:

- Provide the capability to browse and edit IMS databases while they are online in IMS or CICS. Data is viewed and edited using full-screen, ISPF-like panels. Changing a data field in a segment is done by typing over the field value.
- Require a minimal amount of training. File-AID *for IMS* is a menu-driven, online system that is modeled after ISPF.
- Use existing DBDs to define a database structure. Also use existing COBOL or PL/I segment layouts as templates over the data.
- Provide easily understood commands such as CHILD, TWIN, NEXT, PARENT, and ROOT that are used to navigate through a database.
- Provide the capability to insert, delete, and repeat segments and their substructures.
- Support HDAM, HIDAM, HISAM, HSAM, DEDB, MSDB, and logically related databases, including databases with secondary indexes. DEDB databases are supported even if some areas are down.
- Provide an optional audit trail of all segments updated, inserted, repeated, and deleted during an edit session.
- Provide an optional data integrity check to verify that a concurrent update did not occur while a segment was being updated.

Invoking File-AID for IMS

File-AID *for IMS/DC* executes as a non-conversational, Message Processing Program (MPP) under IMS/DC. To invoke File-AID *for IMS/DC*, enter the transaction code defined by your installation. The default transaction code is FILEAID.

File-AID *for IMS/CICS* executes as a command-level, pseudo-conversational program under CICS. To invoke File-AID *for IMS/CICS*, enter the transaction code defined by your installation. The default transaction code is IXC.

The first screen displayed upon entry to File-AID *for IMS/DC* is the Primary Option Menu (Figure 1-1 on page 1-2). The captions for File-AID *for IMS/CICS* are slightly different than for File-AID *for IMS/DC*.

Figure 1-1. File-AID *for IMS/DC* Primary Option Menu

```

----- File-AID for IMS/DC PRIMARY OPTION MENU -----
OPTION  ===>

      1 BROWSE - Display data base contents           RELEASE - 16.3
      2 EDIT   - Create or change data base contents CPU ID  - 323697
      L LEGAL  - Copyright and Trade Secret Information  TERMINAL - XAS78A01
      X EXIT   - Terminate File-AID for IMS/DC session  TIME    - 08:38:01
                                           DATE    - 14-09-26

      DBD TO BE USED  ===>           (Blank for member list)

-----
Enter your USERID and PASSWORD:

      USERID  ===>
      PASSWORD ===>

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```

Select an option, and enter its one-character code in the Option field. For example, to select the Edit function, enter:

```
OPTION  ===> 2
```

Primary Options

Option 1 : The Browse option is used to display but not change the contents of databases using the Formatted, Unformatted, and Index display modes.

Option 2 : The Edit option is used to display, change, insert, and delete the contents of databases using the Formatted, Unformatted, and Index display modes.

Option L : The Legal option contains the copyright and trade secret notices associated with File-AID *for IMS*.

PSB Generation

To browse or edit a database using File-AID *for IMS*, the Program Communication Block (PCB) for that database must be included in a File-AID *for IMS* Program Specification Block (PSB). Depending on your installation's security procedures, it may be necessary for you to contact the person responsible for PSB generations or File-AID *for IMS* at your installation.

File-AID *for IMS* supports segment sensitivity. Different views of a database can be attained by coding SENSEG statements in the PCB. For more information on PSB Tailoring, refer to the *File-AID Single Install Image Installation and Configuration Guide*.

Database Security

File-AID *for IMS* is completely compatible with any data security software your installation may have (for example, RACF or CA ACF2). File-AID *for IMS* processing does not circumvent your security software in any way.

To limit access to certain databases, File-AID *for IMS* provides the capability to create your own security exit routine, which File-AID *for IMS* will call during its processing.

To ensure that a record of the updates to sensitive databases is maintained, File-AID *for IMS* provides an optional Audit Trail feature. The activation of the Audit Trail feature when certain databases are edited is controlled at the installation level by the person responsible for File-AID *for IMS*.

If you require information on your installation's security exit routine or use of the Audit Trail feature, contact the person responsible for File-AID *for IMS* at your installation.

Terminating File-AID *for IMS*

File-AID *for IMS* can be terminated in any of the following ways:

- Enter Option X on the Primary Option Menu.
- Enter the =X jump command on any screen.
- Press CLEAR.

File-AID *for IMS/CICS* can also be terminated by pressing the PA1, PA2, or PA3 key.

File-AID *for IMS* can terminate abnormally in the following situations:

- When File-AID *for IMS* detects an unrecoverable error.
- When the IMS or CICS control program abends.

In the first situation, File-AID *for IMS* is able to recover without abending but cannot continue with the current session. The next keyboard interaction returns you to the Primary Option Menu. File-AID *for IMS* backs out the database updates that were made since the most recent sync point was taken with an IMS ROLB call (File-AID *for IMS/DC*) or a CICS SYNCPOINT ROLLBACK command (File-AID *for IMS/CICS*). Because IMS and CICS take a sync point for every interaction, any updates entered since the last interaction are not reflected in the database.

When File-AID *for IMS* detects an unrecoverable error, the Error Display screen shown in Figure 1-2 is displayed. This screen is slightly different for File-AID *for IMS/CICS*. The error message is shown at the bottom of the screen. Data that pertains to the type of error that occurred may also be displayed.

Figure 1-2. File-AID for IMS/DC Error Display Screen

```

----- File-AID for IMS/DC ERROR DISPLAY -----
                                                    TIME - 16:27:12
                                                    DATE - 07/06/20

*****
*
*   File-AID for IMS/DC has terminated abnormally for the
*
*   reason shown below. The next keyboard interaction will
*
*   result in a return to the main menu.
*
*****

IMS STATUS CODE = NE                DATA BASE NAME = PORDR
CALL FUNCTION = ISRT                SEGMENT NAME = ORDR010
                                      PCB LVL NUMBER = 01
                                      PCB NUMBER = 007

PCB KEY FEEDBACK = XAS78A50XTPORDR  ORDR010  AA2222
E989 N OR NE - INDEX MAINTENANCE ERROR - SEE IMS MESSAGE DFS0840114
    
```

When the IMS or CICS control program abends, the following results:

File-AID for IMS/DC

An Error Display screen is not shown. The transaction and program stop, and the terminal is locked in response mode.

File-AID for IMS/CICS

An error display map may be shown. File-AID *for IMS* attempts to activate an exit routine by using a HANDLE ABEND command. If the exit routine is successful, then the error display map is shown with the CICS abend code. If the exit routine is unsuccessful, then a map is not shown, and CICS message "DFH2206" is displayed.

Contact the person responsible for File-AID *for IMS* at your installation for assistance.

Screen Format

Generally, the first three lines of each screen display are formatted as follows:

TITLE	SHORT MESSAGE	
COMMAND/OPTION	SCROLL	
LONG MESSAGE		

Title Displays the title of the current screen and, in some cases, the current dataset name and member.

Short Message Displays error conditions or current line/column number.

Command/Option Used to enter commands or option selections.

Scroll Contains the current scroll amount on screens where scrolling applies.

Long Message Displays an expanded explanation of error conditions upon request (this line is normally blank or contains display-only fields).

Types of Screens

File-AID *for IMS* displays the following screens:

- Option selection
- DBD Member list
- Scrollable data display

Option Selection Screen

An option selection screen enables you to select an option from a list. The Primary Option menu is an example of this type of screen.

Figure 1-3. Primary Option Menu

```

----- File-AID for IMS/DC PRIMARY OPTION MENU -----
OPTION  ===>

      1 BROWSE - Display data base contents          RELEASE - 16.3
      2 EDIT  - Create or change data base contents CPU ID  - 323697
      L LEGAL - Copyright and Trade Secret Information  TERMINAL - XAS78A01
      X EXIT  - Terminate File-AID for IMS/DC session  TIME    - 08:38:01
                                           DATE     - 14-09-26

      DBD TO BE USED ===>          (Blank for member list)

-----
Enter your USERID and PASSWORD:

      USERID  ===>
      PASSWORD ===>

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```

DBD Member List Screen

A DBD member list screen displays a list of members. An S is entered next to the desired member name to select it.

Figure 1-4. DBD Member List Screen

```

----- EDIT - DBD MEMBER LIST -----
COMMAND ===>                                SCROLL ===> CUR

--DBD---          -----DATA BASE DESCRIPTION-----
- LCUST           LOGICAL CUSTOMER DATA BASE
- LORDR          LOGICAL ORDER DATA BASE
- PCUST          PHYSICAL CUSTOMER DATA BASE
- PORDR          PHYSICAL ORDER DATA BASE
- PPAR           PHYSICAL PART DATA BASE
                *** END OF DBD MEMBER LIST ***

PF1-MENU  3-END  7-UP  8-DOWN

```

Scrollable Data Display Screen

A scrollable data display screen shows database contents or segment layouts. Up/down and, in some cases, left/right scrolling is available. The Formatted screen is an example of this type of screen.

Figure 1-5. Formatted Screen

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- LINE 00001
COMMAND ===>                                SCROLL ===> CUR
PAR
SEG  ORDR010  ORDER ROOT      CONCAT KEY: AA2222
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- -----FIELD VALUE-----
01  ORDER-ROOT-DATA
05  ORDER-ROOT-KEY
07  ORDER-NUMBER-PREFIX      C   2   K  AA
07  ORDER-NUMBER            Z   4   K  2222
05  ORDER-DESCRIPTION      C  40   INDUSTRIAL GRADE COAXIAL CABLE
      (POS 31-40)
05  CUSTOMER-NUMBER        C   6   CN0001
05  PLANNED-ORDER-QUANTITY PS   5   500
05  PLANNED-ORDER-AMOUNT   P   5   2  3567.50
05  ORDER-TYPE             C   2   WS
05  ACTUAL-ORDER-QUANTITY  PS   5   INVALID X'404040'
05  TOTAL-SCRAP-QUANTITY   PS   5   10
05  TOTAL-SCRAP-REDEFINES  RDEFINES TOTAL-SCRAP-QUANTITY
      C   3   INVALID X'00010C'
05  ORDER-STATUS          Z   2   01
05  FILLER                 C   1   <
05  FIRST-ACTIVITY-DATE

PF1-MENU  2-DBD  3-END  4-NEXT  5-CHILD  6-TWIN  7-UP  8-DOWN  9-PAR  12-ROOT

```

Scrolling

In many File-AID *for IMS* functions, the information displayed exceeds the screen size. The scrolling commands enable you to move the information up or down, right or left to view all the displayable data. In addition, the LOCATE command can be used on some screens to scroll to a specified line number or data-name.

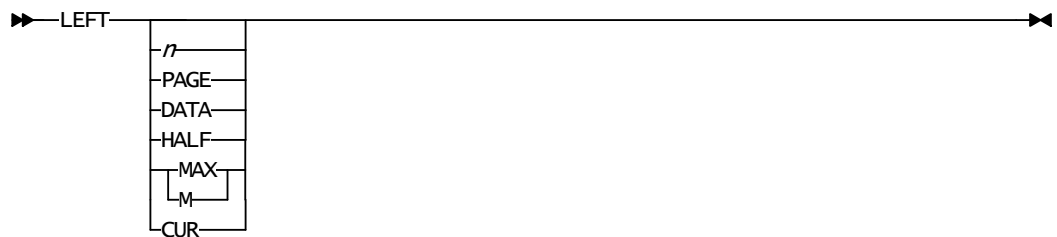
UP Command : Scrolls toward the top of a segment, database, segment layout, or member list by the specified scroll amount.



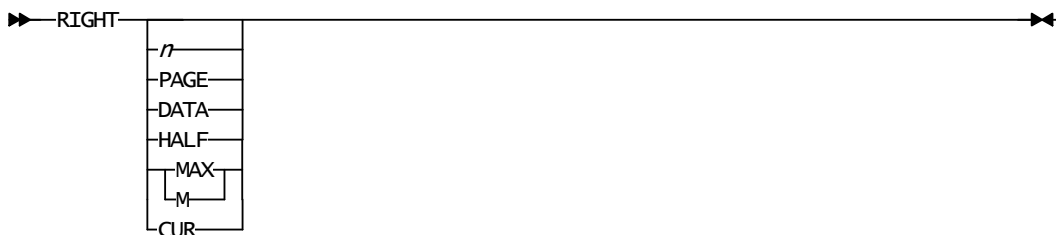
DOWN Command : Scrolls toward the end of a segment, database, segment layout, or member list by the specified scroll amount.



LEFT Command : Scrolls toward the left margin of the displayed segments. Left scrolling is available on the Browse/Edit Character screen only.

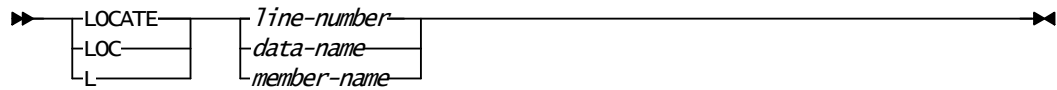


RIGHT Command : Scrolls toward the right margin of the displayed segments. Right scrolling is available on the Browse/Edit Character screen only.



LOCATE Command : Scrolls directly to a specified line number, segment layout data-name, or member name. If the line number entered exceeds the number of displayable lines, a line that designates the end of the scrollable lines is displayed. You can use an abbreviation for the data-name. If the abbreviation applies to more than one segment layout line, scrolling is to the first one that the abbreviation applies to based on the current cursor position. If you enter a member name that is

not found, the last existing entry in the member list that alphabetically precedes the entered member name is displayed at the top of the screen.



A scroll amount is displayed on line two of screens that allow scrolling. The value indicates the number of lines or columns to scroll when you enter one of the four page scrolling commands. You can change the scroll amount by simply typing over the scroll amount.

Following are the valid scroll amounts:

A number from 1 to 9999 : The number of lines/columns to scroll.

PAGE : Scroll by one logical page.

DATA : Scroll by one logical page less one line.

HALF : Scroll by half of a logical page.

MAX : Scroll to the top, bottom, or left/right margin, depending on which scrolling command is used.

CUR : Scroll based on the current position of the cursor. The line or column where the cursor is positioned is moved to the top, bottom, or left/right margin depending on which scrolling command is used. If the cursor is not in the body of the data or if it is already positioned at the top, bottom, or left/right margin, a full page scroll occurs.

For scrolling purposes, a page is defined as the amount of information currently visible on the logical screen.

You can enter a scroll amount in the Command field and use a scroll command or PF key to override the current scroll amount on a given interaction. For example, you can enter:

```
COMMAND ==> DOWN 5
```

and press ENTER, or

```
COMMAND ==> 5
```

and press the DOWN PF key.

Either format results in a temporary, one-time override of the scroll amount.

To reduce keystrokes, change the scroll amount by typing over the first character in the scroll amount field.

To change the scroll amount to PAGE, DATA, HALF, MAX, or CUR, type over the first character with P, D, H, M, or C, respectively.

To change the scroll amount to a number of lines or columns, type a number over the first character.

Command Entries

All File-AID *for IMS* primary and line commands are summarized in Appendix A, "Command Summary". In addition, commands specific to a File-AID *for IMS* function are fully described in the chapter describing that function.

Primary Commands

Primary commands can be entered in one of the following ways:

- By typing the command in the Command field and pressing ENTER.
- By pressing a PF key that is assigned a command.

Before you press a PF key, you can enter information in the Command field. The PF key definition is concatenated ahead of the contents of the Command field.

For example, if you type 6 in the Command field and press PF8, the results are the same as if you had typed DOWN 6 in the Command field and pressed ENTER.

Jump Commands

Jump commands enable you to switch from one option to another without going through the Primary Option Menu. A jump command consists of an equal sign, followed by a primary option entered in any prompt field (fields preceded by ===>). For example:

```
COMMAND ===> =0.2
```

Line Commands

Line commands are entered in the two-position line command column next to the appropriate item. Line commands enable you to insert, delete, and repeat segments, to change your current position in a database, and to select items.

Terminal Keys

You can use the program access (PA), program function (PF), and CLEAR keys to request commonly used operations. PF keys are not required by File-AID *for IMS*, but a default set of PF key definitions are defined for your use.

Program Access Keys

PA keys perform different functions depending on the product being used.

File-AID *for IMS/DC*

PA1 : Provides the next physical page of the current message. Because File-AID *for IMS/DC* does not utilize physical paging, pressing PA1 causes unpredictable results.

PA2 : Removes the current output message from the queue, and provides the first physical page of the next message. File-AID *for IMS/DC* operates in response mode and locks the terminal so that multiple File-AID *for IMS/DC* transactions cannot be queued. However, previous transactions may have been queued before you invoked File-AID *for IMS/DC*.

File-AID *for IMS/CICS*

PA1, PA2, PA3 : Terminates the File-AID *for IMS/CICS* session.

Program Function Keys

The default PF key assignments are shown below. Each screen's PF keys and corresponding commands are displayed on the last line of the screen.

PF1/13	MENU
PF2/14	DBD
PF3/15	END
PF4/16	NEXT
PF5/17	CHILD
PF6/18	TWIN
PF7/19	UP
PF8/20	DOWN
PF9/21	PARENT
PF10/22	LEFT
PF11/23	RIGHT
PF12/24	ROOT

Clear Key

The CLEAR key terminates the File-AID *for IMS* session.

System Overview

The File-AID *for IMS* system consists of both online and batch IMS and CICS processes. The online processes are used to interactively browse and edit IMS databases. The batch processes are used to establish and maintain the environment in which the online processes execute.

Online Processes

The online processes for File-AID *for IMS* and File-AID *for IMS/CICS* follow.

File-AID *for IMS/DC*

The online portion of File-AID *for IMS/DC* consists of single segment, non-conversational MPP applications that run under IMS/DC. Following are the components:

- Product Load modules
- Product MFS Modules
- 3 Control Databases
- 3 Control DBDs
- 1 or more Transactions
- 1 or more PSBs/ACBs

Transaction Codes

File-AID *for IMS/DC* is initially invoked by entering a transaction code. The default transaction code is FILEAID unless it was changed during the installation process. Additional transaction codes may have been created to invoke File-AID *for IMS/DC*. These additional transaction codes can be used to access different user databases or can have different security restrictions. If a transaction is to access a Fast Path database then that transaction runs as a Fast Path potential transaction.

Load Modules

The loading and executing of load modules is controlled by the main load module, IXDMAIN (the name may have been changed during installation). Only the load modules necessary during execution are present in the MPP region. In general, each load module processes a single screen.

Control Databases

Three control databases are used to store information created or used during execution. Two of the databases are required and one is optional. Following is a list of the control databases:

- The LTM control database is required and is used to store information between screen displays. It is used extensively by the online processes.
- The CLT control database is also required and contains mostly static information about the user databases and segment layouts. It is primarily updated by the batch processes of File-AID *for IMS/DC*.
- The AUD or Audit Trail control database is optional. If your installation chooses to use the Audit Trail feature, the AUD database is used to capture the update activity processed against the databases the installation specifies.

All control databases use the HDAM access method to retrieve and store segments. The LTM database has two levels and a total of four segment types. The CLT database has only

one segment type (that is, it is a root-only database). The AUD database has two levels and two segment types.

Control Database DBDs

Three physical DBDs are used by File-AID *for IMS/DC* to access the control databases. No logical DBDs are used.

PSB/ACB

At least one PSB/ACB is used by each transaction code that invokes File-AID *for IMS/DC*. This PSB contains the PCBs necessary to access the I/O queue, alternate I/O queue, control databases, and user databases. All the PCBs for the user databases can be contained in one PSB or can be split among several PSBs. In the latter case, a separate transaction code is used with each PSB.

MFS Screens

File-AID *for IMS/DC* uses standard MFS screens for 3270 type devices. The following screen sizes are supported:

- 24 x 80
- 27 x 132
- 32 x 80
- 43 x 80

Only 24 x 80 lines are displayed on 27 x 132 line screens.

File-AID for IMS/CICS

The online portion of File-AID *for IMS/CICS* consists of a command level, pseudo-conversational application that runs under CICS. Following are the components:

- Product Load Modules
- 4 BMS Mapsets (each containing multiple maps)
- 3 Control Databases
- 3 Control DBDs
- 1 or more Transactions
- 1 or more PSBs/ACBs

Transaction Codes

File-AID *for IMS/CICS* is initially invoked by entering a transaction code. The default transaction code is IXC unless it was changed during the installation process. Additional transaction codes may have been created to invoke File-AID *for IMS/CICS*. These additional transaction codes can be used to access different user databases or may have different security restrictions.

Load Modules

The loading and calling of load modules is controlled by the main load module IXCMAN (the name may have been changed during installation). In general, each load module processes a single screen.

Termination of the File-AID *for IMS/CICS* session is performed by the load module IXCEND. The source code is provided in member IXCEND in the Source dataset and can be modified to meet your requirements. Also, the Installation Parameter, ENDPGM, can be changed to point to a program at your installation.

Control Databases

Three control databases are used to store information created or used during execution. Two of the databases are required and one is optional. Following is a list of the control databases:

- The LTM control database is required and is used to store information between screen displays. It is used extensively by the online processes.
- The CLT control database is also required but mostly contains static information about the user databases and segment layouts. It is primarily updated by the batch processes of File-AID *for IMS/CICS*.
- The AUD or Audit Trail control database is optional. If your installation chooses to use the Audit Trail feature, the AUD database is used to capture the update activity processed against the databases the installation specifies.

All control databases use the HDAM access method to retrieve and store segments. The LTM database has two levels and a total of four segment types. The CLT database has only one segment type (that is, it is a root-only database). The AUD database has two levels and two segment types.

Control Database DBDs

Three physical DBDs are used by File-AID *for IMS/CICS* to access the control databases. No logical DBDs are used.

PSB/ACB

At least one PSB/ACB is used by each transaction code that invokes File-AID *for IMS/CICS*. This PSB contains the PCBs necessary to access the control databases and the user databases. The last four characters of each PSB name must match the associated transaction code. All the PCBs for the user databases can be contained in one PSB or can be split among several PSBs. In the latter case, a separate transaction code is used with each PSB.

BMS Mapsets

File-AID *for IMS/CICS* uses standard function BMS for 3270 type devices. The following screen sizes are supported:

- 24 x 80
- 27 x 132
- 32 x 80
- 43 x 80

Only 24 x 80 lines are displayed on 27 x 132 line screens. Each mapset load module contains multiple maps and supports one of the above screen sizes.

Batch Processes

The batch portion of File-AID *for IMS* consists of support and maintenance programs for the control databases used by the online processes. They can be executed as batch DLI, IMS BMP, or CICS shared database jobs. Following are the components:

- Five programs
- Three control databases
- Three control database DBDs
- One PSB/ACB
- One or more user database DBD libraries

- One segment/layout cross reference library
- One or more segment layout libraries

Programs

XREF Update (XIXXRFUP) and DBD Update (XIXNDUPB or XIXODUPB) programs are described in Appendix F, “File-AID for IMS/CICS or File-AID for IMS/DC Batch DBD and XREF Update” in the *File-AID Single Install Image Installation and Configuration Guide*.

The Rebuild Control Segment (XIXREBLD) program is used when an emergency rebuild of the control segment is required. Its function is described in “CLT Control Segment Inadvertently Updated or Deleted” on page 4-4.

The Audit Trail Extract (XIXATEXT) and Audit Trail Report (XIXATRPD) programs are used to extract and report on the information contained in the optional Audit Trail control database. These programs are described in Chapter 3, “Batch Audit Trail Processing”.

Control Databases

The control databases are the same as those used by the online processes of *File-AID for IMS* (refer to “Online Processes” on page 1-11).

Control Database DBDs

Control database DBDs are the same as used by the online processes of *File-AID for IMS*.

PSB/ACB

One PSB is used by all the batch support and maintenance programs. It contains the PCBs necessary to access the control databases. An ACB is used when the batch programs are run as IMS BMP or CICS shared database jobs.

User Database DBD Library

An existing user database DBD load library is used by *File-AID for IMS* without any modifications. This library contains the user database DBDs and is read by the DBD Update (XIXDBDUP) program to collect information about the hierarchical structure of the user databases. This information is then stored on the CLT control database for use by the online processes.

Segment/Layout Cross Reference Library

The segment/layout cross reference library is maintained by *File-AID for IMS/ISPF* Option 7. This library is used by the *File-AID for IMS* XREF Update program (XIXXRFUP) to determine the segment layout to be used for a segment type. This information is then stored on the CLT control database for use by the online processes. For more information, refer to Chapter 6, “File-AID for IMS/ISPF Segment/Layout Cross Reference”.

Segment Layout Library

The segment layout library is an existing user library used by the XREF Update program (XIXXRFUP) to copy the necessary segment layouts to the CLT control database for use by the online processes. This library is not updated by *File-AID for IMS*. For more information about the segment layout libraries refer to Chapter 2, “Browse and Edit Data Base”.

Chapter 2. Browse and Edit Data Base

Options 1 and 2, Browse and Edit, are used to browse or edit an IMS database. In browse, the database can only be viewed. In edit, the database can be updated. The screens displayed for both functions are identical, except for the screen titles. This chapter describes the Edit function. Except where noted, the information also applies to the Browse function.

You can browse and edit HISAM, SHISAM, HDAM, HIDAM, DEDB, MSDB, and logical databases. You can browse HSAM, SHSAM, and INDEX databases.

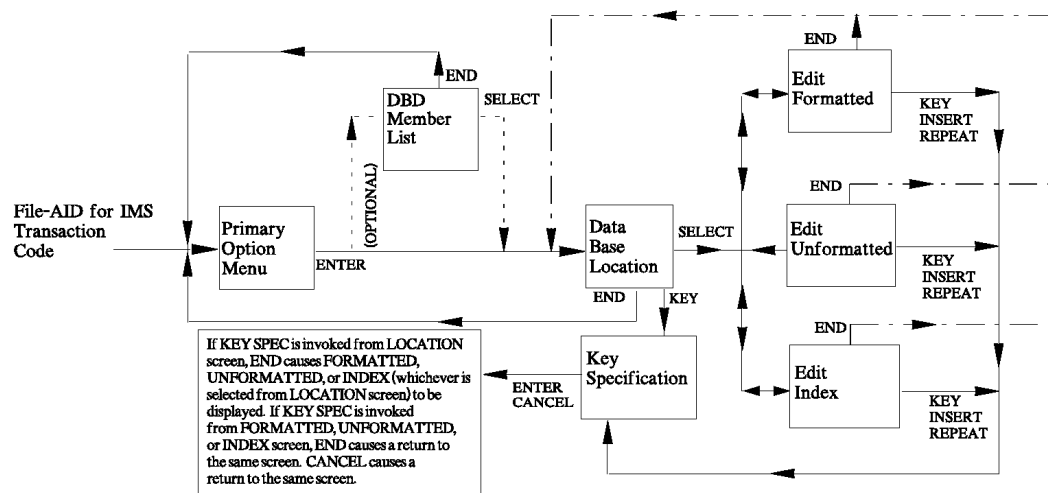
The database must be initialized and loaded with at least an initial root segment before you access it with File-AID *for IMS*. You can use File-AID *for IMS/ISPF*, DFSDDLTO or some other utility program to insert an initial root segment into the database. DEDB databases can have areas down, in which case the down area is simply skipped and is not accessible.

To browse or edit your databases in the IMS/DC or CICS environment, the databases' Data Base Definition (DBD) information must be made available to File-AID *for IMS*. Refer to Appendix F, "File-AID for IMS/CICS or File-AID for IMS/DC Batch DBD and XREF Update" in the *File-AID Single Install Image Installation and Configuration Guide* for more information.

Browse/Edit Conversation

Figure 2-1 provides a pictorial summary of the flow of the edit conversation. This chapter describes the screens in the conversation and their valid commands.

Figure 2-1. Browse/Edit Conversation Flow



File-AID *for IMS/DC* and File-AID *for IMS/CICS* are invoked with a transaction code that is defined for their use through an IMS system definition or a CICS resource definition. One or more transaction codes can be defined for use with the products. The default transaction code for File-AID *for IMS/DC* is FILEAID. The default transaction code for File-AID *for IMS/CICS* is IXC.

Upon entry to the edit conversation from the Primary Option Menu, you can, optionally, go to the DBD Member List screen or directly to the Data Base Location screen.

If a DBD is not specified on the Primary Option Menu, the DBD Member List screen is displayed with the DBDs that can be accessed. When a DBD is selected, the editing conversation continues. When the END command is entered, the edit session is terminated, and you are returned to the Primary Option Menu.

If a DBD is specified on the Primary Option menu, the Data Base Location screen is displayed. This screen serves as the anchor point for the rest of the conversation.

From here, there are several ways to control the edit session. The Data Base Location screen displays a hierarchical picture of the database, with each segment type shown on a separate line. Editing can begin with any segment type. You can start with a specific segment occurrence in the database (by specifying the key value of a segment) or the first segment occurrence in the database for the segment type you selected.

Once you select a segment type and occurrence, you can select any of the three editing modes—Formatted, Unformatted, or Index.

The Formatted mode uses the segment/layout cross reference to determine the appropriate segment layout for each segment type. The Formatted screen displays the contents of a specific segment occurrence with the segment layout on the left side of the screen and the data on the right. You can scroll through the segment contents and type over any data you want to change. (In browse, you cannot type over any segment data).

The Unformatted screen displays the contents of a segment occurrence in a 3-line vertical, hexadecimal format. You can scroll through the segment contents and type over the data you want to change.

The Index screen looks very much like ISPF's edit screen. The segment occurrence specified is shown at the top of the screen body. The remainder of the screen body consists of a hierarchical, sequential listing of the segments that follow the selected segment in the database. The screen displays one segment per line in a character format. You can move left and right to view segment contents and scroll down to move hierarchically through the database.

There are two ways to move from the segment specified on the Data Base Location screen to a new segment. You can use one of the navigational commands that *File-AID for IMS* provides (CHILD, TWIN, NEXT, PARENT, ROOT), or you can go to the Key Specification screen where you can specify the key value of the segment that you want to move to.

You can switch from one editing mode to another at any time. You can also go to the Key Specification screen from each editing mode. After you specify the key of the segment you want, control is returned to the editing mode you were in, and the new segment is displayed.

From each of the edit modes, you can also INSERT, DELETE, and REPEAT segments. (These commands are not supported in the browse option.)

When END is entered from any of the edit modes, you are returned to the Data Base Location screen. From this screen, you can then select another segment and edit mode for processing or enter END to return to the Primary Option Menu or DBD Member List screen.

Primary Option Menu

File-AID for IMS/DC executes as a non-conversational, Message Processing Program (MPP) under IMS/DC. To invoke *File-AID for IMS/DC*, enter the transaction code defined by your installation. The default transaction code is FILEAID.

File-AID *for IMS/CICS* executes as a pseudo-conversational program under CICS. To invoke File-AID *for IMS/CICS*, enter the transaction code defined by your installation. The default transaction code is IXC.

The first screen displayed is the Primary Option Menu (Figure 2-2). The captions for File-AID *for IMS/CICS* are slightly different than for File-AID *for IMS/DC*.

Figure 2-2. File-AID *for IMS/DC* Primary Option Menu

```

----- File-AID for IMS/DC PRIMARY OPTION MENU -----
OPTION  ===>

      1 BROWSE - Display data base contents          RELEASE - 16.3
      2 EDIT   - Create or change data base contents CPU ID   - 323697
      L LEGAL  - Copyright and Trade Secret Information  TERMINAL - XAS78A01
      X EXIT   - Terminate File-AID for IMS/DC session  TIME    - 08:38:01
                                           DATE    - 14-09-26

                DBD TO BE USED ===>                (Blank for member list)

-----
Enter your USERID and PASSWORD:

                USERID  ===>
                PASSWORD ===>

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All Rights Reserved.

```

DBD to be Used : Enter a DBD name. The Data Base Location screen (Figure 2-4 on page 2-5) is displayed. This is the first screen in the browse/edit session. If you leave the DBD to be Used field blank, the DBD Member List screen (Figure 2-3 on page 2-4) is displayed, which enables you to select a DBD from a list.

USERID and Password : Provides criteria your installation's security exit can use to limit access to the databases defined in this transaction's PSB for File-AID *for IMS*. Refer to "Database Security" on page 1-3 for more information. If your installation does not enforce a security exit, both the USERID and Password fields can be blank.

DBD Member List

The DBD Member List screen, shown in Figure 2-3 on page 2-4, lists the DBDs you can access in the edit option. This screen is only displayed if you do not specify a DBD name in the DBD to be Used field on the Primary Option Menu.

Figure 2-3. DBD Member List Screen

```

----- EDIT - DBD MEMBER LIST -----
COMMAND ===>                                SCROLL ===> CUR

  --DBD--          ----DATA BASE DESCRIPTION-----
  _ LCUST          LOGICAL CUSTOMER DATA BASE
  _ LORDR          LOGICAL ORDER DATA BASE
  _ PCUST          PHYSICAL CUSTOMER DATA BASE
  _ PORDR          PHYSICAL ORDER DATA BASE
  _ PPART          PHYSICAL PART DATA BASE
                  *** END OF DBD MEMBER LIST ***

PF1-MENU  3-END  7-UP  8-DOWN

```

DBD : Displays a list of available DBD names in alphabetical order. Refer to “Selecting a DBD” on page 2-4.

Data Base Description : Displays a 30-byte DBD description created by the DBD Update Facility prior to accessing File-AID *for IMS*.

Selecting a DBD

The DBD list shown on the DBD Member List screen is created from the PSB you generated for File-AID *for IMS*. Only the DBDs listed in the PSB being used are shown. Additional security at the DBD level is available through a security exit your installation can enforce (refer to “Database Security” on page 1-3). If your installation does use the security exit to limit database access, only those DBDs where access is granted are displayed on the member list. You can select a DBD from the list in one of the following ways:

- Enter S next to the DBD you want.
- Enter SELECT followed by the DBD name in the Command field.

You can scroll through the list using the UP and DOWN commands. The LOCATE command enables you to scroll to a specific DBD line. The entry for the DBD appears as the first line following the column header lines. If the DBD is not found, scrolling is to the DBD name that, in the standard collating sequence, immediately precedes the specified DBD. Refer to “Scrolling” on page 1-6 for a complete description of these commands.

When you leave the Data Base Location screen and return to the DBD Member List screen, the member list is displayed with an automatic scroll to the DBD just processed. You can then select another DBD or enter the END command to return to the Primary Option Menu.

Terminating the Screen

- Press ENTER to proceed to the Data Base Location screen.
- Enter END or MENU to return to the Primary Option Menu.
- Enter =X to clear the screen and return to IMS or CICS.

Edit Data Base Location

The Data Base Location screen, shown in Figure 2-4, is used to control the editing of your database. This screen is initially displayed after you specify a DBD from the Primary Option Menu or the DBD Member List screen. Figure 2-5 on page 2-6 graphically displays the hierarchical structure of a sample database.

Figure 2-4. Data Base Location Screen

```

----- EDIT - DATA BASE LOCATION ----- LINE 0001
COMMAND --->                               SCROLL ---> CUR

LINE
CMD  ----LEVEL----- --SEG-- --DESCRIPTION-- KEY      KEY
S_* 1 DBD-PORDR      ORDR010 ORDER ROOT   006 AA2222 -----
--- 2                ORDR020 ORDER LINE   002
--- 3                ORDR030 ORDER STATUS  002
--- 2                ORDR040 ORDER SCRAP   008
--- 2                ORDR050 ORDR-CUST LCHLD 002
                               *** END OF SEGMENT LIST ***

S  -- Select Formatted           K  -- Key Spec, then Select Formatted
SU -- Select Unformatted         KU -- Key Spec, then Select Unformatted
SI -- Select Index of Segments   KI -- Key Spec, then Select Indexed

PF1-MENU  2-DBD  3-END  7-UP  8-DOWN

```

Line Cmd : Used to select a segment for editing. Refer to “Selecting a Segment” on page 2-6 for more information.

Level : Displays the segment type’s hierarchical level number in the database. For the root segment type, the primary DBD name is displayed next to the level number.

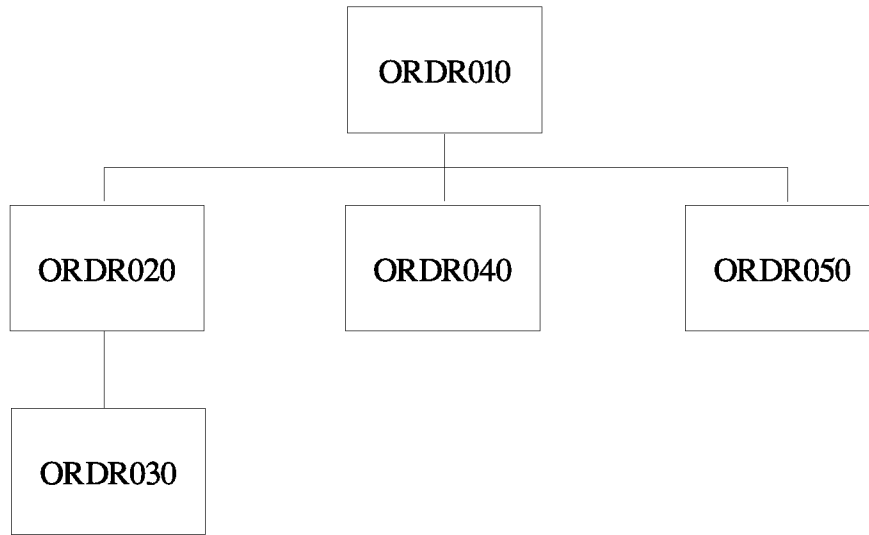
Seg : Displays the segment name as specified in the DBD.

Description : Displays a 15-character segment description. This description is retrieved from the segment/layout cross reference created in Option 7 of File-AID for IMS/ISPF.

Key LTH : Displays the segment key length. If the segment is nonkeyed, zero is displayed.

Key Value : Displays up to 30 positions of the key value for each segment occurrence. Additional information about this field is provided in the next section.

Figure 2-5. Hierarchical Structure of Sample Database



Selecting a Segment

When you initially enter the Data Base Location screen, your current position in the database is dependent on the type of database being edited.

For a database defined without a randomizing routine, the first root segment occurrence is retrieved and the key is placed in the Key Value column on the root segment line (Figure 2-6 on page 2-6). File-AID for IMS considers this root segment occurrence to be your current position in the database.

For HDAM and DEDB databases, File-AID for IMS allows you to specify a key value to retrieve the first segment in the database. This process reduces IMS' search time to retrieve a root segment for a database defined with a randomizing routine.

Figure 2-6. Data Base Location Screen - Selecting a New Segment

```

----- EDIT - DATA BASE LOCATION ----- LINE 00001
COMMAND ==>                               SCROLL ==> CUR

LINE
CMD  ----LEVEL----  --SEG--  --DESCRIPTION--  KEY  KEY
-----  -----  -----  -----  ---  -----VALUE-----
_*  1 DBD-PORDR    ORDR010  ORDER ROOT      006  AA2222
   2              ORDR020  ORDER LINE      002  01
S   3              ORDR030  ORDER LINE      002  01
   2              ORDR040  ORDER SCRAP      008
   2              ORDR050  ORDR-CUST LCHLD 002
                        *** END OF SEGMENT LIST ***

S  -- Select Formatted           K  -- Key Spec, then Select Formatted
SU -- Select Unformatted         KU -- Key Spec, then Select Unformatted
SI -- Select Index of Segments   KI -- Key Spec, then Select Indexed

PF1-MENU  2-DBD  3-END  7-UP  8-DOWN52
  
```

The Data Base Location screen indicates your current position by placing an asterisk in the Line Cmd field of all segment types in the hierarchical path to your current position. The first 30 positions of the key value for each segment occurrence in the hierarchical path to your current position are also shown.

To change your current segment position, enter the key value for each segment type in the hierarchical path to the segment occurrence you want. Then, enter one of the six valid line commands shown at the bottom of the screen in the Line Cmd field next to the segment type you want.

File-AID *for IMS* retrieves the new segment occurrence and then, based on the line command specified, does one of the following:

- S** Enters the Formatted editing mode (page 2-24).
- SU** Enters the Unformatted editing mode (page 2-27).
- SI** Enters the Index editing mode (page 2-29).
- K** Displays the Key Specification screen (page 2-35) and enters the Formatted editing mode.
- KU** Displays the Key Specification screen and enters the Unformatted editing mode.
- KI** Displays the Key Specification screen and enters the Index editing mode.

To retrieve the first segment in an HDAM and DEDB database, you must enter one of the line commands and, optionally, a key value on the Data Base Location or Key Specification screen. File-AID *for IMS* retrieves the first root segment if a key value is not specified on the Data Base Location screen with line command S, SU, or SI.

Use the K, KU, or KI line command when you need greater flexibility to specify key values than the Data Base Location screen allows. By using one of these line commands to proceed to the Key Specification screen before entering an editing mode, you can, for example, enter key values greater than 30 characters in length.

To specify the key values in the hierarchical path to a segment occurrence, you can leave any or all of the Key Value fields blank. If you leave the Key Value field blank on the segment type you selected, File-AID *for IMS* formats an unqualified SSA at that level. IMS then retrieves the first occurrence of that segment type in the specified hierarchical path.

If you enter a key for the segment type you selected but leave the Key Value field blank for one of its parent segment types, File-AID *for IMS* formats an unqualified SSA at the parent's level. IMS then searches through each occurrence of that parent segment type in the specified hierarchical path. The search stops when an occurrence of the segment type you selected is found with a key value that matches what was entered or when all occurrences of the parent without a key entered are searched.

For example, in Figure 2-7, File-AID *for IMS* formats the SSAs so that IMS searches through all occurrences of the ORDR020 segment type that exist under the ORDR010 root with a key equal to AA2222, looking for an occurrence of the ORDR030 segment type with a key of 02.

If the correct ORDR030 segment occurrence is found, you enter the Unformatted editing mode with that ORDR030 segment as your current segment. If the correct ORDR030 segment cannot be found, an error message is displayed on the Data Base Location screen.

If, as shown in the example, both the ORDR010 and ORDR020 Key Value fields are blank when the ORDR030 segment type is selected, File-AID *for IMS* formats the SSAs so that IMS searches for the first ORDR030 occurrence in the database with a key value of 02. If all three Key Value fields are blank, IMS retrieves the first ORDR030 occurrence in the database.

Figure 2-7. Data Base Location Screen - Leaving a Key Field Blank

```

----- EDIT - DATA BASE LOCATION ----- LINE 00001
COMMAND ===>                               SCROLL ===> CUR

LINE
CMD  ----LEVEL----- --SEG-- --DESCRIPTION-- KEY      KEY
-----* 1 DBD-PORDR   ORDR010 ORDER ROOT  006 AA2222  VALUE-----
----- 2              ORDR020 ORDER LINE   002
SU_  3              ORDR030              002 02
----- 2              ORDR040 ORDER SCRAP   008
----- 2              ORDR050 ORDR-CUST LCHLD 002
                               *** END OF SEGMENT LIST ***

S  -- Select Formatted           K  -- Key Spec, then Select Formatted
SU -- Select Unformatted         KU -- Key Spec, then Select Unformatted
SI -- Select Index of Segments   KI -- Key Spec, then Select Indexed

PF1-MENU  2-DBD  3-END  7-UP  8-DOWN52
    
```

When a segment type is nonkeyed, File-AID *for IMS* formats an unqualified SSA at that level, which results in the same processing done for segment types where you did not enter key values.

When key values of 13 positions or less in length are specified, you can enter the hexadecimal representation of the key value. The format is X'nnnn...', where each n digit is one half-byte of data. You must enter an even number of digits when using this format.

When a key value in character or hexadecimal format is specified and the value entered is shorter than the length shown in the Key LTH column, File-AID *for IMS* blank pads the key value to the right.

The Data Base Location screen always shows the hierarchical path to the segment occurrence in the database that is the current position with asterisks and key values. The Data Base Location screen saves those key values and displays them each time you return to the screen. Saved key values are updated for each segment in the current hierarchical path each time you return to the Data Base Location screen.

Key values that are not in the current hierarchical path are not updated. Saved key values can be updated by typing over them, whether or not they are in the current hierarchical path.

For example, in Figure 2-8, the hierarchical path to the current segment position includes segment types ORDR010 and ORDR040 with key values of AA2222 and 01C7477A, respectively. Those two key values are displayed each time you return to the Data Base Location screen until different occurrences of the ORDR010 and ORDR040 segment types are part of the current hierarchical path or until you change the key values.

Figure 2-8. Data Base Location Screen - Saved Key Values

```

----- EDIT - DATA BASE LOCATION ----- LINE 00001
COMMAND ===>                                SCROLL ===> CUR

LINE
CMD  ---LEVEL----- --SEG-- --DESCRIPTION-- KEY          KEY
---* 1 DBD-PORDR      ORDR010 ORDER ROOT  006 AA2222  VALUE-----
---  2                ORDR020 ORDER LINE  002 01
---  3                ORDR030                002 03
---*  2                ORDR040 ORDER SCRAP  008 01C7477A
---  2                ORDR050 ORDR-CUST LCHLD 002 01
                               *** END OF SEGMENT LIST ***

S  -- Select Formatted           K  -- Key Spec, then Select Formatted
SU -- Select Unformatted         KU -- Key Spec, then Select Unformatted
SI -- Select Index of Segments   KI -- Key Spec, then Select Indexed

PF1-MENU  2-DBD  3-END  7-UP  8-DOWN52

```

The last time this screen was displayed, ORDR020 and ORDR030 were in the current hierarchical path with key values 01 and 03. The last time that ORDR050 was in the current hierarchical path, it did not show the key value of 01. This value was typed in manually.

The Data Base Location screen saves prior key values to enable you to easily reposition to previously selected segment occurrences.

Terminating the Screen

Do one of the following to terminate the Data Base Location screen:

- Enter RETURN or DBD to return to the DBD Member List screen.
- Enter END to return to the Primary Option Menu or the DBD Member List screen.
- Enter MENU to return to the Primary Option Menu.

Common Edit Primary Commands

You can use the following primary commands in any of the three editing modes—Formatted, Unformatted, or Index. Each of these commands operates the same in all three editing modes. Except where noted, each command is also valid in Browse. Refer to Appendix A, “Command Summary” for the syntax and function of all the primary commands.

CAPS	Sets or changes caps mode.
DBD	Returns to the DBD Member List screen.
END	Returns to the Data Base Location screen.
FORMAT	Switches to Formatted editing mode.
INDEX	Switches to Index editing mode.
KEY	Displays the Key Specification screen.
MENU	Returns to the Primary Option menu.
PARENT	Retrieves specified parent of current segment.
RETURN	Returns to the DBD Member List screen.

ROOT	Retrieves specified root segment.
UNFORMAT	Switches to Unformatted editing mode.

CAPS Command

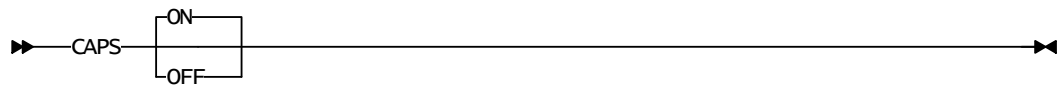
The CAPS command controls the caps mode while in File-AID *for IMS*. If caps mode is ON, lowercase alphabetic data gets translated to uppercase.

In the formatted editing mode with caps mode ON, if any data is changed then the entire field will automatically be translated to upper case, whereas in character and unformatted editing mode, only the changed data is translated to upper case.

Note: Data is considered changed if a character is overtyped with a different character or the same character of a different case. Overtyping a lower case character with the same lower case character is not considered a change.

If caps mode is OFF, lowercase alphabetic data is left as is. Existing lowercase alphabetic data is displayed in lowercase.

The caps mode is retained from session to session in the user profile. You can change the setting at any time using the CAPS command within File-AID *for IMS/ISPF*. If you omit the operand, ON is assumed.



Note: File-AID *for IMS/DC* prevents unintended IMS upper case translation by specifying 'GRAPHIC= NO' on the SEG statement in the MFS. This allows File-AID *for IMS/DC* to control when upper case translation is performed by using the CAPS command which minimizes the inadvertent translation of fields such as those containing numeric data. The MFS language utility states "If input segment data is in non-graphic format (packed decimal, EGCS, binary, and so forth), GRAPHIC=NO should be specified." Specifying 'EDIT=UC' on the TRANSACT macro will have no effect on upper case translation due to the 'GRAPHIC=NO' parameter in the MFS.

DBD Command

The DBD command (PF2/14) causes an immediate return to the DBD Member List screen. There are no operands associated with the DBD command.

END Command

The END command (PF3/15) terminates the current editing mode and returns control to the Data Base Location screen. There are no operands associated with the END command.

FORMAT, INDEX, and UNFORMAT Commands

You can enter the FORMAT, INDEX, and UNFORMAT commands from any of the three editing modes.

The FORMAT command causes a switch to the formatted editing mode from the Unformatted or Index editing modes.

The UNFORMAT command causes a switch to the Unformatted editing mode.

The INDEX command causes a switch to the Index editing mode.

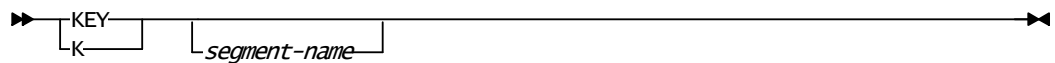
When you switch to the index editing mode, File-AID *for IMS* positions the current segment occurrence (as viewed in formatted or unformatted) at the top of the screen body. Conversely, when you switch to formatted or unformatted from index, File-AID *for IMS* positions you on the segment at the top of the Index screen body. When you switch between formatted and unformatted, File-AID *for IMS* leaves you positioned on the current segment occurrence.

The FORMAT command can be abbreviated to FMT, and the UNFORMAT command can be abbreviated to UNFMT.

There are no operands associated with any of these commands.

KEY Command

You can change your position in a database from the current segment position to any other segment position using the KEY command.



If you enter the KEY command without a SEGMENT-NAME operand, the Key Specification screen is displayed based on your current hierarchical path and segment position. For example, if your current segment type is at the third level of the database, the Key Specification screen enables you to specify any key value for each segment type in the hierarchical path to that current segment type.

When you use the SEGMENT-NAME operand with the KEY command, the segment name you enter must be one that is defined in the primary DBD you entered on the Data Base Specification screen. The Key Specification screen displayed is based on the current hierarchical path and the position of the segment whose name you entered within the database hierarchy.

For example, assume your current segment type is on the second hierarchical level of a database and you enter the KEY command with the name of a segment type that is on the fourth hierarchical level. Although the current hierarchical path extends only as far as the second level in the database, the Key Specification screen enables you to specify key values down to and including the specified segment type on the fourth level.

Refer to page 2-34 for a detailed explanation and examples of how to use the Key Specification screen.

When you complete the Key Specification screen for the new segment you want, the segment is retrieved from the database and you are returned to the editing mode from which you entered the KEY command. The new segment becomes the current segment position.

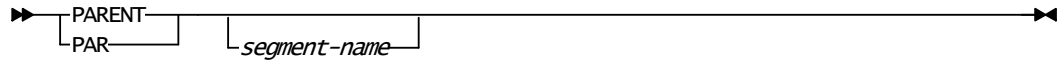
The KEY command is not supported when you browse an HSAM or SHSAM database.

MENU Command

The MENU command (PF1/13) causes an immediate return to the Primary Option Menu. There are no operands associated with the MENU command.

PARENT Command

The PARENT command (PF9/21) enables you to change your position in a database from the current segment position to any higher-level segment in the current hierarchical path.



If you enter the PARENT command without the SEGMENT-NAME operand, the immediate parent of the current segment is retrieved and becomes the new current segment.

If you specify the SEGMENT-NAME operand with the PARENT command, the segment named must be a hierarchical parent of the current segment. The parent you specify is retrieved and becomes the new current segment.

If the parent segment name you specify is not defined in the primary DBD or is not a hierarchical parent of the current segment, an error is returned.

The PARENT command is invalid when the current segment occurrence is a root segment type.

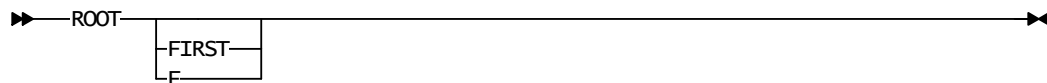
Refer to page 2-50 for information on how the PARENT command is affected by nonkeyed and nonunique segments.

RETURN Command

The RETURN command causes an immediate return to the DBD Member List screen or to the option specified, if any. For example, if you enter RETURN =1 or =1 from the Formatted screen, the next screen displayed is the DBD Member List screen in Browse mode.

ROOT Command

The ROOT command enables you to change your position in a database from the current segment position to either the root segment in the current hierarchical path or the first root segment in the database.



If you enter the ROOT command without the FIRST operand, File-AID *for IMS* retrieves the root segment in the current hierarchical path. Adding the FIRST operand to the ROOT command causes File-AID *for IMS* to retrieve the first root segment occurrence in the database.

Refer to page 2-50 for information on how the ROOT command is affected by nonkeyed and nonunique segments.

Common Formatted/Unformatted Primary Commands

You can use the following primary commands in both the Formatted and Unformatted editing modes. Each command operates the same in both editing modes, except where noted. Each command is also valid in browse mode, except where noted. Scroll

commands (UP, DOWN) apply only to scrollable lists and are described in “Scrolling” on page 1-6. Refer to Appendix A, “Command Summary” for the syntax and function of all commands.

CANCEL : Cancels changes made to current segment (edit only).

CHILD : Retrieves specified child of current segment.

DELETE : Deletes current segment from database (edit only).

LOCATE : Scrolls to specified line number or specified COBOL or PL/I data name.

NEXT : Retrieves specified occurrence of specified segment type.

REFRESH : Retrieves current version of segment (edit only).

REPEAT : Inserts new segments with current segment data (edit only).

TWIN : Retrieves specified occurrence of current segment type under current parent.

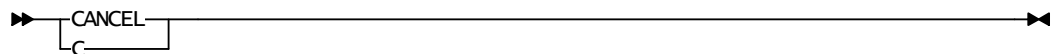
CANCEL Command (Edit only)

The CANCEL command is used to restore the contents of the current segment to the way it was before you changed it. For example, if you make changes to different fields in the current segment and decide you want to restore the original contents of those fields, use the CANCEL command.

Any changes you make to the current segment can be cancelled provided you remain positioned on that segment occurrence. Changes to the current segment take effect as soon as you move to a different segment in the database.

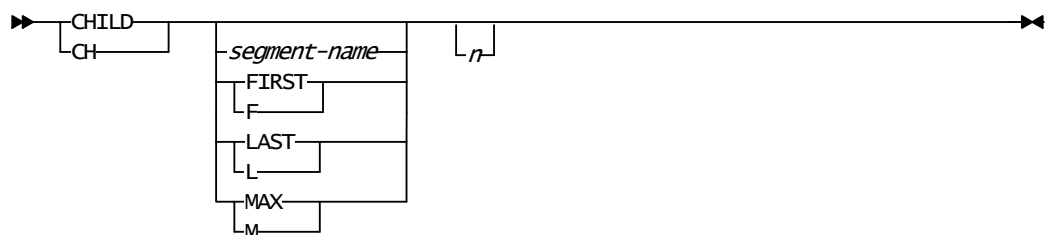
The CANCEL command is especially useful if you change a key or non-replaceable field and need to recall the prior (valid) field contents.

There are no operands associated with the CANCEL command. The CANCEL command can be abbreviated to CAN.



CHILD Command

The CHILD command (PF5/17) enables you to change your position in a database from the current segment position to any occurrence of any segment that is hierarchically dependent to the current segment.



If you enter the CHILD command without any operands, File-AID *for IMS* retrieves the first occurrence of the first hierarchical child defined in the DBD under the current segment.

If you enter the CHILD command without specifying a segment-name operand, File-AID *for IMS* restricts its child processing to the first hierarchical child segment type under the current segment. If you enter the segment-name operand, it must be one of the segment types defined in the DBD to be a hierarchical dependent of the current segment type. The

segment name entered does not have to be an immediate child segment type at the next hierarchical level in the database under the current segment. You can specify the name of any dependent segment type in the hierarchical substructure under the current segment. When you enter the segment-name operand, File-AID *for IMS* restricts its child processing to the dependent segment type specified.

The occurrence operand identifies which occurrence of the specified dependent segment type under the current segment you want retrieved. If you do not enter the occurrence operand, File-AID *for IMS* retrieves the first occurrence of the specified dependent segment type under the current segment. Following are the valid values for the occurrence operand:

n : A positive integer from 1 to 2,147,483,647. File-AID *for IMS* retrieves the *n*th occurrence of the specified dependent segment type. If less than *n* occurrences of the specified dependent segment type exist, an error message is displayed.

FIRST, F : File-AID *for IMS* retrieves the first occurrence of the specified dependent segment type if one exists.

LAST, L : File-AID *for IMS* retrieves the last occurrence of the specified dependent segment type if one exists.

MAX, M : Same as LAST operand.

When the requested dependent segment occurrence cannot be found, the current segment position does not change.

Note: The CHILD primary command is not valid for unkeyed segments (see also "Nonkeyed and Nonunique Segments" on page 2-50)

DELETE Command (Edit only)

The DELETE command enables you to delete segment occurrences from a database. When the DELETE command is entered, the current segment and all dependent segment occurrences are deleted. After the deletion occurs, the next twin occurrence of the current segment type becomes the new current segment. If the current segment deleted is the last occurrence of that segment type in the current hierarchical path, the informational message "POSITIONED BEYOND TWINS" is displayed. You can then use one of the database movement commands to select a new current segment.

If the Integrity Check feature is active and the segment has been updated by a concurrent user, File-AID *for IMS* automatically displays the current version of the segment again. This process enables you to review the current segment before deleting it.

There are no operands associated with the DELETE command. The command can be abbreviated to DEL or D.

LOCATE Command

The LOCATE command enables you to scroll the contents of the current segment toward the top or bottom of the segment.



When a data-name operand is entered, File-AID *for IMS* scrolls the screen body of the display to the line in the segment layout that contains that data-name. Use of the data-name operand is restricted to the Formatted mode. The data-name can be up to 30 characters or can be an abbreviation.

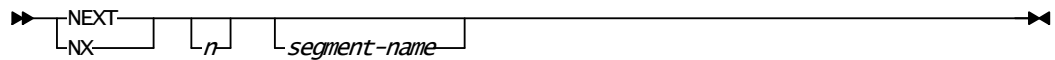
If the abbreviation applies to more than one data-name, File-AID *for IMS* scrolls to the first line in the segment layout that applies based on the current cursor position. For example, assume that three data-names in the segment layout start with the characters XYZ on lines one, five, and eight. If you enter LOCATE XYZ, move the cursor to line three, and press ENTER, File-AID *for IMS* scrolls line number five to the top of the screen body. If the data-name or abbreviation entered does not exist between the line the cursor is positioned on and the end of the segment layout, File-AID *for IMS* wraps around and resumes the LOCATE process with line number one.

You can also specify an occurrence number with the data-name (or abbreviation) for occurring fields. For example, LOCATE XYZ(3).

You can use the line-number operand with the LOCATE command in either Formatted or Unformatted mode. The line-number operand causes File-AID *for IMS* to scroll the screen body of the display to that line number in the segment layout. The line-number must be in the range 1 to 2,147,483,647. If the line-number entered is greater than the line number of the last segment layout line, File-AID *for IMS* scrolls to the last line in the layout.

NEXT Command

The NEXT command (PF4/16) enables you to change your position in a database from the current segment position to any segment occurrence in the database that is after the current segment and before the end of the database.



The NEXT command disregards parentage and hierarchical boundaries during its processing. If the NEXT command is entered without any operands, File-AID *for IMS* retrieves the next segment occurrence in the database. The new current segment may or may not be the same type as the previous current segment.

The integer occurrence operand, *n*, can range from 1 to 2,147,483,647. For example, if NEXT 12 is entered, File-AID *for IMS* retrieves the twelfth segment that exists after the current segment, regardless of segment type and parentage. If the integer occurrence operand is larger than the number of segment occurrences that exist after the current segment, the "BOTTOM OF DATA BASE" message is displayed. If the NEXT command is entered again at this point, the NEXT process wraps around and starts at the beginning of the database.

The segment-name operand restricts the NEXT process to the segment type entered. For example, if NEXT 7 ORDR030 is entered, File-AID *for IMS* retrieves the seventh occurrence of the ORDR030 segment type that exists after the current segment. If only four occurrences of the ORDR030 segment type exist after the current segment, the BOTTOM OF DATA BASE message is displayed. Another NEXT command can then be entered to continue NEXT processing from the top of the database.

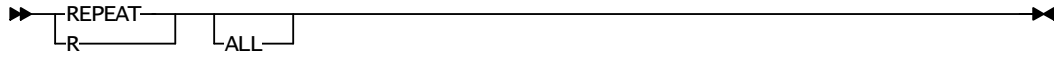
REFRESH Command (Edit only)

The REFRESH command is used to retrieve the most current version of the segment being updated. When the Integrity Check feature is active and the segment has been updated by a concurrent user, the REFRESH command is required. After issuing the REFRESH command, the current version of the segment replaces any changes made.

There are no operands associated with the REFRESH command. The REFRESH command can be abbreviated to REF.

REPEAT Command (Edit only)

The REPEAT command enables you to repeat a single segment occurrence or an entire hierarchical substructure of a database.



When the REPEAT command is entered, the Key Specification screen is displayed. The key values for each segment type in the current hierarchical path from the root segment to the current segment are displayed on the Key Specification screen. You can specify the fully concatenated key for the new segment to be created by typing over these key values.

There are many alternatives when specifying the new fully concatenated key. If you enter a new key value for the current segment type but leave the key values for the parent segments as is, a new segment occurrence is inserted into the database under the current parents. The new segment is a twin of the current segment.

If you enter new key values for any of the parent segments, the key values must be for parent segments that already exist in the database. If the parent segments exist, the new segment is inserted under those parents. If one or more of the parent segments do not exist, the error message "HIGHER LEVEL SEGMENT NOT FOUND" is displayed. You do not necessarily need to specify a new key value for the repeated segment when you want the repeated segment inserted under a different parent segment.

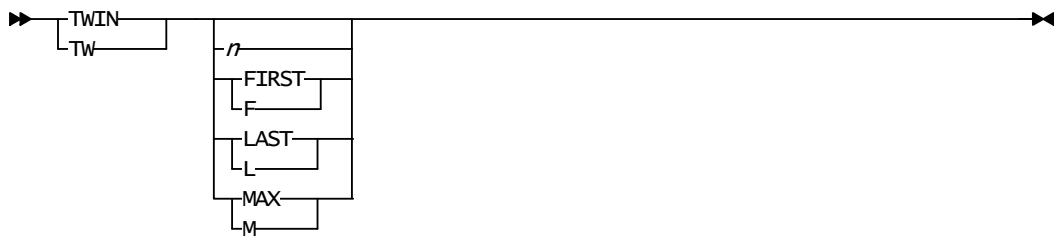
After you specify the fully concatenated key for the new segment, enter the END command on the Key Specification screen. You are returned to the editing mode you were previously in and positioned on the newly inserted segment. All nonkey field data in the new current segment is copied from the previous current segment.

Adding the ALL operand to the REPEAT command has no effect on the procedure just described. The ALL operand causes all occurrences of the hierarchically dependent child segments to also be repeated. These children are inserted under the new current segment with the same key and data values they had under the previous current segment. The ALL operand, in effect, repeats an entire substructure of the database.

Refer to page 2-50 for information on how the REPEAT command is affected by nonkeyed, nonunique, and key-only segments.

TWIN Command

The TWIN command (PF6/18) enables you to change your position in a database from the current segment position to another occurrence of the current segment type under the current parent.



If you enter the TWIN command without an occurrence operand, File-AID for IMS retrieves the next occurrence of the current segment type under the same parent. If no other occurrence of the current segment type exists under the same parent, the message "POSITIONED BEYOND TWINS" is displayed. This message is issued to notify you that

you are positioned beyond the last twin occurrence of the current segment type under the current parent and are on a hierarchical boundary.

When positioned on a hierarchical boundary, you can enter the TWIN command again. File-AID *for IMS* then crosses the hierarchical boundary, retrieves the next occurrence of the current segment type that exists, and displays the message "SEGMENT UNDER NEW PARENT." This message is issued to notify you that you have crossed a hierarchical boundary and are positioned on the first occurrence of the current segment type under a new parent.

If you enter the TWIN command while positioned on a hierarchical boundary and there are no more twin occurrences of the current segment type existing in the database, the message "BOTTOM OF DATA BASE" is displayed. You can then use the NEXT command to wrap around to the top of the database.

The integer occurrence operand, *n*, can range from 1 to 2,147,483,647. Use this operand with the TWIN command to skip twin occurrences under the current parent to reach the specific twin occurrence you want. For example, assume you are positioned on the first twin occurrence of a segment type under the current parent. You want to change your current position to the fifth occurrence of the same segment type under the same parent. You can enter four separate TWIN commands or TWIN 4.

If you enter the TWIN command with an integer occurrence operand value that is greater than the number of remaining occurrences of the current segment under the current parent, File-AID *for IMS* stops at the hierarchical boundary and displays the message "POSITIONED BEYOND TWINS." You can then cross the hierarchical boundary by specifying the TWIN command again, with or without the integer occurrence operand. It is possible when positioned on a hierarchical boundary to enter TWIN *n* to go directly to the next hierarchical boundary in the database. If *n* is larger than the number of occurrences of the current segment type under the next parent, all twin occurrences under the next parent are skipped and you go directly to the next hierarchical boundary.

Other valid TWIN command occurrence operands are FIRST, LAST, and MAX. TWIN FIRST positions you to the first twin occurrence of the current segment type under the current parent. TWIN LAST and TWIN MAX position you to the last twin occurrence of the current segment type under the current parent. When you specify one of these three occurrence operands, File-AID *for IMS* prevents you from crossing a hierarchical boundary. You can retrieve only the first or last twin occurrence of the current segment under the current parent with these operands. The last and max operands are invalid when you are positioned on the root segment type.

The FIRST, LAST, and MAX occurrence operands are useful when you unintentionally position yourself on a hierarchical boundary. For example, assume you are positioned on the first twin occurrence of the current segment type under the current parent. You enter TWIN 5 to change your current position to the sixth twin occurrence of the current segment type under the current parent. If only four occurrences of the current segment type exist under the current parent, you are positioned on a hierarchical boundary. At this point, you can reposition yourself using the first, last, or max operand with the TWIN command.

Note: The TWIN primary command is not valid for unkeyed segments (see also "Nonkeyed and Nonunique Segments" on page 2-50)

Edit Formatted Mode

The Formatted screen is used to edit the segment occurrences in a database in formatted mode using segment layouts as masks over the data. One segment occurrence per screen and one field per line are displayed on the Formatted screen as shown in Figure 2-9.

Figure 2-9. Formatted Screen

```

EDIT --- (LORDR - ORDER DB - LOGICAL VIEW) ----- LINE 0001
COMMAND ===>                                     SCROLL ===> PAGE
PAR
SEG  ORDR010  ORDER ROOT      CONCAT KEY: AA2222
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- -----FIELD VALUE-----
01  ORDER-ROOT-DATA
05  ORDER-ROOT-KEY
07  ORDER-NUMBER-PREFIX      C   2   K  AA
07  ORDER-NUMBER            Z   4   K  2222
05  ORDER-DESCRIPTION      C  40   INDUSTRIAL GRADE COAXIAL CABLE
    (POS 31-40)
05  CUSTOMER-NUMBER        C   6   CN0001
05  PLANNED-ORDER-QUANTITY PS   5   500
05  PLANNED-ORDER-AMOUNT  P   5   2  3567.58
05  ORDER-TYPE             C   2   WS
05  ACTUAL-ORDER-QUANTITY PS   5   100
05  TOTAL-SCRAP-QUANTITY  PS   5   10
05  TOTAL-SCRAP-REDEFINES RDEFINES TOTAL-SCRAP-QUANTITY
                                C   3   INVALID X'00010C'
05  ORDER-STATUS          Z   2   01
05  FILLER                 C   1   <
05  FIRST-ACTIVITY-DATE

PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT

```

You can access this screen from the Data Base Location, Unformatted, Index, or Key Specification screen. The segment occurrence shown on the Format screen is always the current segment occurrence in the database.

The UP and DOWN primary commands enable you to scroll through the segment layout while staying fixed on the current segment. The database movement commands (CHILD, KEY, NEXT, PARENT, ROOT, and TWIN) enable you to change your current segment position to another segment occurrence in the database.

PAR and RCD TYP1 : Displays the segment name of the immediate parent of the current segment type and its description from the segment/layout cross reference dataset. If the current segment type is defined by multiple segment layouts, the current segment's record type values are also shown.

SEG and CONCAT Key : Displays the segment name of the current segment type and its description from the segment/layout cross reference dataset. The first 37 characters of the fully concatenated key of the current segment are also displayed. The key values for each segment type represented in the fully concatenated key are separated by commas.

Level Number/Data-Name : Displays the level number and data-name of each item in the segment layout.

Format : Displays the format of each item (for COBOL, its USAGE and PICTURE information; for PL/I, its attribute information). The Format column is blank for group items. For elementary items, it has the following meaning:

- COBOL** The first position indicates the field's data type.
- C** alphanumeric (PIC X)
- P** packed decimal (PIC 9 COMP-3)
- B** binary (PIC 9 COMP)
- Z** zoned decimal (PIC 9, USAGE DISPLAY)
- COMP-1** COMPUTATIONAL-1 (internal floating point, fullword)
- COMP-2** COMPUTATIONAL-2 (internal floating point, doubleword)
- INDEX** INDEX data item

The second position contains an S for signed numeric fields (P, B, and Z items).

The third portion indicates one of the following:

- The number of characters in an alphanumeric field (C item); or
- The number of integer digits in the PICTURE of a numeric field (P, B, and Z items).

The fourth portion indicates the number of decimal digits in the PICTURE of a numeric field (P, B, and Z items). If there are no decimal digits, the fourth portion is blank.

The fifth portion contains a K for fields that define the key of the current segment.

PL/I	The first position indicates the field's data type.
C	alphanumeric (CHAR or PIC X)
P	packed decimal (FIXED DECIMAL)
B	binary (FIXED BINARY)
Z	zoned decimal (PIC 9)
FD	decimal floating point (FLOAT DECIMAL)
FB	binary floating point (FLOATING BINARY)
BT	BIT data item
PTR	POINTER data item

The second position contains an S for signed numeric fields (P, B, and Z items).

The third portion indicates one of the following:

- The number of characters in an alphanumeric field (C item).
- The number of integer digits in a packed or zoned numeric field (P and Z items).
- The number of integer digits in the maximum value a binary field (B item) can hold (5 for FIXED BIN (1) through FIXED BIN (15); 10 for FIXED BIN (16) through FIXED BIN (31)).
- The number of decimal digits in a decimal floating point field (FD item).
- The number of binary digits in a binary floating point field (FB item).
- The number of bits in a bit field (BT item).

The fourth portion indicates the number of decimal digits in a packed or zoned numeric field (P and Z items). If there are no decimal digits, the last portion is blank.

The fifth portion contains a K for fields that define the key of the current segment.

Field Value : Displays the contents of each elementary item in the current segment. Field Value is blank and protected for lines with non-elementary items. It is also protected for key fields. Simply type over the Field Value column to change the field value.

For alphanumeric fields, this column shows the character representation of the field with the following exceptions:

1. If the field contains all hexadecimal zeroes (X'0000...'), the word LOW-VALUES is displayed. Conversely, to enter HEX zeroes in an alphanumeric field, enter the word LOW-VALUES.
2. If the field contains all hexadecimal Fs (X'FFFF...'), the word HIGH-VALUES is displayed. Conversely, to enter HEX Fs in an alphanumeric field, enter the word HIGH-VALUES.
3. If the field contains non-displayable characters and is not all HEX zeroes or Fs, the word INVALID is displayed, followed by one of the following:
 - The hexadecimal representation of the field for fields 10 characters or less in length in the format - X'nnnn...'. This HEX string can be changed by either typing over it or by erasing the entire field and entering a new HEX string, left justified in the field.

- The literal "-SEG POSITION nnnnn" for fields greater than 10 characters in length, where nnnnn represents the starting position of the field in the segment. In this case you must use the Unformatted mode to view the contents of the field or to enter a HEX string in the field.

Alphanumeric fields longer than 30 positions are split across as many consecutive lines as necessary. If a field longer than 30 bytes contains an invalid character, the "INVALID" message is displayed on the line that contains that character.

For example, a data element occupies 40 bytes, which are split across 2 lines in the Field Value column (30 bytes on the first line and 10 on the second line). If an invalid character exists in this 40-byte field, the "INVALID" message is displayed according to the position of the invalid character as outlined below:

- If the invalid character occurs in positions 1 through 30, the "INVALID" message is displayed on the first line.
- If the invalid character occur in positions 31 through 40, the "INVALID" message is displayed on the second line.

In Figure 2-10 on page 2-20, the data element ORDER-DESCRIPTION contains an invalid character between positions 31 and 40. This condition caused the "INVALID" message to be displayed on the second line occupied by ORDER-DESCRIPTION in the Field Value column.

Figure 2-10. Formatted Screen - Invalid Character Beyond Position 30

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- LINE 00001
COMMAND ==>                                     SCROLL ==> CUR
PAR
SEG  ORDR010  ORDER ROOT      CONCAT KEY: AA2222
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- -----FIELD VALUE-----
01  ORDER-ROOT-DATA
05  ORDER-ROOT-KEY
07  ORDER-NUMBER-PREFIX      C   2   K   AA
07  OREDR-NUMBER             Z   4   K  4444
05  ORDER-DESCRIPTION      C   40   HIGH PERFORMANCE COAX
      (POS 31-40)             INVALID X'40000000404040404040'
05  CUSTOMER-NUMBER         C   6   CN0055
05  PLANNED-ORDER-QUANTITY  PS   5   550
05  PLANNED-ORDER-AMOUNT    P   5  2  5209.58
05  ORDER-TYPE              C   2   HT
05  ACTUAL-ORDER-QUANTITY   PS   5   51
05  TOTAL-SCRAP-QUANTITY    PS   5   INVALID X'F04040'
05  TOTAL-SCRAP-REDEFINES   REDEFINES TOTAL-SCRAP-QUANTITY
      C   3   0
05  ORDER-STATUS           Z   2   03
05  FILLER                  C   1
05  FIRST-ACTIVITY-DATE
PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT52
    
```

Zoned decimal, packed decimal, and binary fields are converted to external decimal for display and type over purposes. An external decimal consists of a negative sign (for signed fields that contains a negative value), the integer portion of the number, and, for fields with decimal positions, a decimal point followed by the decimal portion of the number. The following rules apply when numeric fields are typed over:

- The value can start anywhere in the Field Value column.
- There can be one or more blanks between the negative sign, if any, and the value.
- No spaces can be imbedded in the integer and decimal portions of the value.

- The sign and integer and decimal precision of the value entered are fully validated against the field format.
- Scale positions must be zero in the value entered.
- A HEX string (for example, X'4141...') can be entered in fields that are 10 characters or less in length.

If a numeric field initially contains an invalid value given its field format, the word "INVALID" is displayed followed by one of the following:

- The hexadecimal representation of the field for all binary and packed fields and for all zoned decimal fields 10 characters or less in length in the format - X'nnnn...'. This HEX string can be changed by either typing over it or by erasing the entire field and entering a new value, left justified in the field.
- The literal "- SEG POSITION nnnnn" for zoned decimal fields greater than 10 characters in length, where nnnnn represents the starting position of the field in the segment. In this case, you must use the Unformatted mode to view the contents of the field or to enter a HEX string in the field.

File-AID *for IMS* considers numeric fields to be invalid in the following situations:

- A zoned or packed field is not in the zoned or packed format.
- An unsigned field contains a negative value.
- A packed or binary field contains a value too large for the number of digits in its field format.

COBOL : File-AID *for IMS* does not format POINTER and INDEX data items. The Field Value column always shows the hexadecimal representation of these fields in the format X'nnnn...'. This HEX string can be changed by either typing over it or by erasing the entire field and entering a new HEX string. The field value must be entered as a four byte HEX string (for example, X'41414141'). The HEX string can start anywhere in the Field Value column but cannot contain imbedded spaces.

PL/I : File-AID *for IMS* does not format FLOAT BINARY and POINTER data items. The Field Value column always shows the hexadecimal representation of these fields in the format X'nnnn...'. This HEX string can be changed by either typing over it or by erasing the entire field and entering a new HEX string. For FLOAT BINARY data items that are stored in fullwords of storage and POINTER data items, the field value must be entered as a four byte hexadecimal string (for example, X'41414141'). For FLOAT BINARY data items that are stored in doublewords of storage, an eight byte hexadecimal string must be entered (for example, X'4141414141414141'). The HEX string can start anywhere in the Field Value column but cannot contain imbedded spaces.

For BIT data items, the Field Value column displays the actual bit representation of the field. This bit string can be changed by either typing over it or by erasing the entire field and entering a new bit string, left justified in the field. The bit string must contain only zeroes and/or ones and cannot contain imbedded spaces.

Note: If you are editing a segment that has multiple record types and you change the record type value fields on the current segment, the new record type values are not reflected in the RCD TYP1 field nor is the new segment layout, if any, used until you move to another segment occurrence and then return to the original segment.

COBOL : File-AID *for IMS* displays items that contain REDEFINES and/or OCCURS clauses in a special way. For items that contain the REDEFINES clause, the level number and data-name are shown the normal way, the word REDEFINES is shown in the Format column, and the data-name of the redefined item is shown in the Field Value column. For elementary items, the field format and value are shown on the next line. Type overs are processed from top to bottom. If both the redefined and redefining items are typed over, the redefining item is processed last and overlays the value in the redefined item.

Items that contain an OCCURS clause are displayed with two heading lines followed by each occurrence of the field with the occurrence number in parentheses. The first heading line shows the level number and data-name in the normal way. The Format and Field Value columns are blank unless the DEPENDING ON option is present and the object of the DEPENDING ON is invalid. In this case, a message is displayed, to indicate the problem with the object of the DEPENDING ON. The second heading line shows the number of occurrences in the Level Number/Data-Name column and the data-name of the object of the DEPENDING ON, if any, in the Field Value column.

When an OCCURS clause has the DEPENDING ON option specified, you can dynamically control the number of times the item occurs by typing over the value of the object of the DEPENDING ON. The value of the object of the DEPENDING ON can range from the minimum to the maximum number of occurrences specified in the OCCURS clause. This process enables you to easily expand and contract a variable length segment. When you increase the value of the DEPENDING ON object, the new occurrences are initialized to blanks and zeroes based on the record layout.

PL/I : File-AID for IMS displays array items in a special way. For each array, two heading lines are displayed followed by each occurrence of the field with the occurrence number in parentheses. The first heading line shows the level number and data-name in the normal way. The Format and Field Value columns are blank. The second heading line shows the number of occurrences as specified by the array's dimension attribute in the Level Number/Data-Name column.

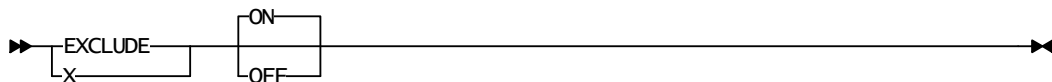
Following the last line of the segment layout, an end of layout message that indicates the length in characters of the segment layout is displayed in the Level Number/Data-Name column. If the segment layout length and current segment length are unequal, a message that indicates the difference is displayed in the Field Value column. If the segment layout is shorter than the segment, the portion of the segment beyond the segment layout is not displayed nor can it be modified in Formatted mode. If the segment layout is longer than the segment, the fields extending beyond the segment have the message "FIELD EXTENDS BEYOND CURR SEG" displayed in the Field Value column, and the fields cannot be typed over.

Excluding Lines

If you want to view or change only certain fields in the segment layout but the fields do not fit on one screen because the segment layout is too long, you can exclude one or more fields from the screen. Excluding lines does not affect the current segment or segment layout in any way. The process affects only what is displayed on the Formatted screen.

Excluding lines is a two-step process.

1. Enter the EXCLUDE command to unprotect the Level Number/Data-Name column.



EXCLUDE ON causes the Level Number/Data-Name column to be unprotected; EXCLUDE OFF causes it to be protected. If the operand is omitted, ON is assumed.

2. Enter the X line command, left justified, in the Level Number/Data-Name column.

X line command syntax

X	Exclude one line
Xn	Exclude n lines
XX	Exclude a block of lines

The number n can range from 1 to 99999. To exclude a block of lines, enter XX on the first and last lines of the block to be excluded. The first and last lines of the block need not be on the same screen. You can enter only one pair of block commands per interaction.

Excluded lines are replaced by dashes (-) in the Level Number/Data-Name column. A message in the Field Value column indicates the number of lines and number of characters excluded. File-AID for IMS retains excluded lines as you scroll through a database. You do not have to re-exclude lines each time you scroll to a different segment. To redisplay excluded lines, enter the RESET primary command. After excluding lines, the EXCLUDE OFF command can be entered to reprotect the Level Number/Data-Name column without affecting excluded lines. Figure 2-11 on page 2-23 and Figure 2-12 on page 2-23 show before and after examples of excluding lines.

Figure 2-11. Formatted Screen - Before Excluding Line

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- LINE 00001
COMMAND ==> SCROLL ==> CUR
PAR  ORDRO10 ORDER ROOT      RCD TYP1: PO
SEG  ORDRO20 ORDER LINE      CONCAT KEY: AA2222,01
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- -----FIELD VALUE-----
01  ORDER-LINE-DATA-PO
   05  SEGMENT-LENGTH          BS  4   178
   05  ORDER-LINE-KEY
      07  LINE-NUMBER          C   2   K 01
   05  ORDER-TYPE              C   2   PO
   05  LINE-STATUS             C   7   OPEN
X205  PART-NO                  C   6   C7477A
   05  DESCRIPTION             C  30   BLACK COAXIAL CABLE
   05  UNIT-OF-MEASURE         C   2   EA
   05  PURCHASE-ORDER-INFO
      07  PO-CODE              C   4   WXWW
      07  PO-NUMBER            C  12   AA2222-22
XX 07  PO-COMPANY              C  30   ZENITH WIRE
   07  PO-VENDOR-NUMBER       C   5   2224
XX 07  PO-VENDOR-CODE         C   5   34552
   05  FILLER                  C  30
   05  ORDER-QUANTITIES

PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT

```

Figure 2-12. Formatted Screen - After Excluding Lines

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- LINE 00001
COMMAND ==> SCROLL ==> CUR
PAR  ORDRO10 ORDER ROOT      RCD TYP1: PO
SEG  ORDRO20 ORDER LINE      CONCAT KEY: AA2222,01
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- -----FIELD VALUE-----
01  ORDER-LINE-DATA-PO
   05  SEGMENT-LENGTH          BS  4   178
   05  ORDER-LINE-KEY
      07  LINE-NUMBER          C   2   K 01
   05  ORDER-TYPE              C   2   PO
   05  LINE-STATUS             C   7   OPEN
- - - - -                      2 LINES/36 BYTES NOT DISPLD
   05  UNIT-OF-MEASURE         C   2   EA
   05  PURCHASE-ORDER-INFO
      07  PO-CODE              C   4   WXWW
      07  PO-NUMBER            C  12   AA2222-22
- - - - -                      3 LINES/40 BYTES NOT DISPLD
   05  FILLER                  C  30
   05  ORDER-QUANTITIES
      07  QTY-ORDERED          PS  5   12
      07  QTY-BACKORDERED      PS  5   1
      07  QTY-SHIPPED          PS  5   10

PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT

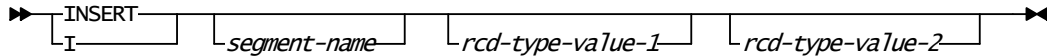
```

Edit Formatted Primary Commands

All the primary commands described in “Common Formatted/Unformatted Primary Commands” on page 2-12 can be used when editing in formatted mode. You can also use the EXCLUDE and RESET primary commands described on page “Excluding Lines” on page 2-22 and the following INSERT and TOG commands.

INSERT Command (Edit only)

The INSERT command enables you to insert a single occurrence of any segment type into a database.



If you do not specify a segment-name operand with the INSERT command, File-AID *for IMS* inserts a new occurrence of the current segment type.

If you do specify a segment-name operand, it must be one of the segment types in the primary DBD. The only restriction to the order of the INSERT command operands is that, when they are specified, the rcd-type-value-1 operand must occur in the operand list before the rcd-type-value-2 operand. The rcd-type-value operands can optionally be delimited by apostrophes or quotation marks. The format X'nnnn...' can be used to enter the HEX representation of rcd-type-values.

Once File-AID *for IMS* completes its initial validation of the INSERT command, the Key Specification screen is displayed. Specify the fully concatenated key of the new segment to be inserted on the Key Specification screen, which is described in “Key Specification” on page 2-34. Upon leaving this screen, the new segment is inserted, and you are returned to the Formatted screen with the new segment as the current segment.

Inserted segments are initialized field by field based on the appropriate segment layout. Alphanumeric fields are initialized with blanks (HEX 40s), and numeric fields are initialized with zero in the appropriate format (packed zero, binary zero).

COBOL : The half byte that contains the sign in packed decimal fields and zoned decimal fields without the "SIGN...SEPARATE CHARACTER" clause, is set to C for signed fields and F for unsigned fields. The sign character in zoned decimal fields with the "SIGN...SEPARATE CHARACTER" clause is set to +. Comp-1, comp-2, and index fields are initialized with HEX zeros.

PL/I : The half byte that contains the sign in packed decimal fields and zoned decimal fields without the S picture character is set to C. The sign character in zoned decimal fields with the S picture character is set to +. Float binary, float decimal, pointer, and bit fields are initialized with HEX zeroes.

The segment layout used in the initialization process is determined by the type of segment being inserted. A segment defined by a single segment layout is referred to as a single record type segment. A segment defined by multiple segment layouts is referred to as a multiple record type segment. When inserting a single record type segment, rcd-type-value-1 and 2 operands cannot be specified. The single segment layout defined to File-AID *for IMS/DC* using the Batch XREF Update Facility for the segment being inserted is used to initialize the new segment. If a segment layout was not defined to File-AID *for IMS/DC* for the segment being inserted, the nonkey field data in the segment is initialized with blanks (HEX 40s).

When inserting a multiple record type segment, the INSERT command operands specified are determined by your current segment position as follows:

- When positioned on an occurrence of the segment type that you want to insert, INSERT command operands do not have to be specified. File-AID *for IMS* initializes

the new segment using the segment layout for the current segment. The rcd-type-value-1 and 2 field values from the current segment are copied into the new segment and the new segment is inserted. The newly inserted segment becomes the new current segment.

If you do specify rcd-type-value-1 and 2 operands, File-AID *for IMS* verifies that the operands are valid values defined to File-AID *for IMS* using the Batch XREF Update Facility. The new segment is initialized based on the segment layout defined to File-AID *for IMS*. The rcd-type-value-1 and 2 values entered are pre-formatted into the new segment, which is then inserted into the database and becomes the new current segment.

If the rcd-type-value-1 and 2 operands specified were not defined to File-AID *for IMS* using the Batch XREF Update Facility, but a default (or other) segment layout was defined to File-AID *for IMS*, File-AID *for IMS* uses the default segment layout to initialize the new segment. The rcd-type-value-1 and 2 values entered are pre-formatted into the new segment, which is then inserted into the database and becomes the new current segment.

- When your current position is on any segment type other than the one you want to insert, the segment-name operand must be entered. Anytime the segment-name operand is entered for a multiple record type segment while in Formatted mode, rcd-type-value-1 and 2 operand values must also be entered. File-AID *for IMS* then initializes the new segment based on the segment layout defined to File-AID *for IMS* and preformats the rcd-type-value-1 and 2 field values as described above, inserts the segment, and positions to it.

Note: Although the rcd-type-value-1 and 2 operands were always described together in the preceding paragraphs, you can have multiple record type segments that are defined with only rcd-type-value-1 values. Refer to Chapter 6, "File-AID for IMS/ISPF Segment/Layout Cross Reference" for a complete explanation of the use of record type values.

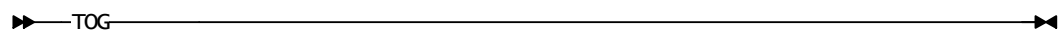
The segment layout used to initialize a segment can also affect the length assigned to the segment. When inserting a fixed length segment, the length assigned is always the length defined for the segment in the DBD. If the segment layout assigned to the fixed length segment is shorter than the segment, the message "LAYOUT TOO SHORT" is displayed, and the segment is not inserted. If the segment layout is longer than the segment, the message "LAYOUT TOO LONG" is displayed, and the segment is not inserted.

When inserting a variable length segment, the associated segment layout is validated to verify that its length is within the segment length range defined in the DBD. If the layout is shorter than the minimum segment length or longer than the maximum segment length, the insert is not performed. If the segment layout length is valid, its length is assigned to the inserted segment.

TOG Command

If a PL/I layout defines a 31 digit numerical field, it is possible that the entire field might not fit on a single screen. The TOG primary command (which is assigned to the PF11 key) enables you to toggle to an alternate display where the entire field is displayed on one screen. Issuing the TOG command on this screen displays the original screen.

The message, "USE PF11 FOR OVER 30DIG" is displayed when the display of a field is truncated.



SEG and CONCAT Key : Displays the segment name of the current segment type and its description from the segment/layout cross reference dataset. The first 37 characters of the fully concatenated key of the current segment are also displayed. The key values for each segment type represented in the fully concatenated key are separated by commas.

SEG Length : Displays the length of the current segment.

Segment Display Format

The current segment is displayed in either three-line vertical HEX mode or character mode. You can switch from one mode to the other using the HEX ON/OFF command. Multiple sets of display lines are separated by an intensified column marker line. The number of the first position in each set of display lines is shown in the left margin of the screen.

The top line of the HEX display represents the character format of the current segment, the middle line represents the upper half byte of each character in hex, and the third line represents the lower half byte of each character in hex. When a character is not displayable, it is represented by a period (.) on the top line. You can type over either the character or HEX line to change segment contents. If you type over both the character and HEX lines for the same character, the character type over is ignored.

In character mode, only the character representation of the segment is displayed. As with HEX mode, when a character is not displayable, it is represented by a period. To change segment contents type over the character representation. Figure 2-14 shows the Unformatted screen in character mode.

Figure 2-14. Unformatted Screen - Character Mode

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) -----
COMMAND ==>                                     SCROLL ==> CUR
PAR  ORDRO10  ORDER ROOT      RCD TYP1: PO
SEG  ORDRO20  ORDER LINE     CONCAT KEY: AA2222,01
SEB  LENGTH ==> 178   MIN:50   MAX:200
-----+-----1-----+-----2-----+-----3-----+-----4-----+-----5-----+-----6-----+-----7
1  ..01POOPEN  C7477ABLACK COAXIAL CABLE          EAWXWAA2222-22  ZEN
-----+-----*-----+-----*-----+-----*-----+-----*-----+-----*-----+-----*-----+-----*
71 ITH WIRE    2224 34552
-----+-----*-----+-----*-----+-----*-----+-----*-----+-----*-----+-----*
141 .....ASTC1988090110990904

PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT

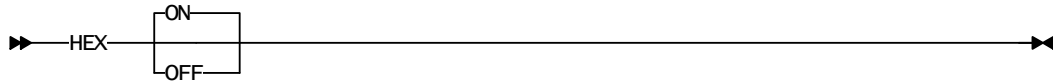
```

Edit Unformatted Primary Commands

All the primary commands described in “Common Formatted/Unformatted Primary Commands” on page 2-12 a can be used when editing in unformatted mode. The following HEX and INSERT primary commands can also be used in unformatted mode.

HEX Command

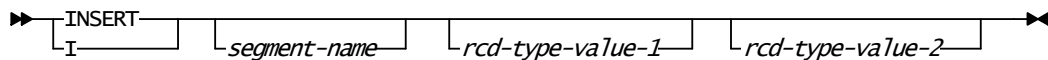
The HEX command controls whether the body of the Unformatted screen is displayed in HEX or character mode.



If the operand is omitted, ON is assumed. When HEX mode is on, the body of the screen is displayed in three-line HEX format. When HEX mode is off, it is displayed in character format. The HEX mode is initialized to ON upon entry to Browse or Edit.

INSERT Command

The INSERT command syntax is the same as in the Formatted mode.



The INSERT command works the same as described in “INSERT Command (Edit only)” on page 2-24 for a single-record type segment (one defined by a single segment layout), except that an unformatted insert is performed. In an unformatted insert, all non-key field data are initialized with blanks (HEX 40s).

When inserting a multiple-record type segment (one defined by multiple segment layouts) in Unformatted mode, the INSERT command operands specified are determined by your current segment position as follows:

- When positioned on an occurrence of the segment type that you want to insert, INSERT command operands do not have to be specified. File-AID *for IMS* performs an unformatted insert. Because the new segment contains blanks instead of valid record type values (unless you defined blanks to be valid record type values in the segment/layout XREF used by the Batch XREF Update Facility), a segment layout is not associated with the new segment. If you switch to Formatted mode while positioned on this segment, you will see a blank screen body with an error message displayed.

If you do specify *rcd-type-value-1* and *2* operands, File-AID *for IMS* verifies that the operands are valid values defined to File-AID *for IMS* using the Batch XREF Update Facility. The new segment is initialized based on the segment layout defined to File-AID *for IMS*. The record type values entered are preformatted into the new segment before it is inserted.

If the *rcd-type-value-1* and *2* operands specified were not defined to File-AID *for IMS* using the Batch XREF Update Facility, but a default (or other) segment layout was defined to File-AID *for IMS*, File-AID *for IMS* uses the default segment layout to initialize the new segment. The record type values entered are preformatted into the new segment before it is inserted.

- When your current position is on any segment type other than the segment type you want to insert, the *segment-name* operand must be entered. Specification of the *rcd-type-value-1* and *2* operands is optional. File-AID *for IMS* performs the insert in the same way as described above, whether or not record type value operands are entered.

Note: Although the *rcd-type-value-1* and *2* operands were always described together in the preceding paragraphs, you can have multiple record type segments that are defined with only *rcd-type-value-1* values. Refer to “Edit Record Type 1 Entries” on page 6-15 and “Edit Record Type 2 Screen” on page 6-18 for a complete explanation of the use of record type values.

When inserting a fixed length single record type segment, the length assigned is always the length defined for the segment in the DBD. When inserting a variable length single record type segment, the length assigned is always the minimum length defined for the segment in the DBD. The existence or validity of a segment layout for a single record type segment has no impact in Unformatted mode.

When inserting a fixed length multiple record type segment, the length assigned is always the length defined for the segment in the DBD. Because formatted inserting is performed for a multiple record type segment while in Unformatted mode, the associated segment layout must pass validation before the insert is completed. If the layout is shorter than the segment, the error message "LAYOUT TOO SHORT" is displayed. If the layout is longer than the segment, the error message "LAYOUT TOO LONG" is displayed. In both instances, the insert is not performed.

When inserting a variable length multiple record type segment, the length assigned depends on the segment layout associated with the segment. The segment layout is validated to verify that its length is within the segment length range defined in the DBD. If the layout is shorter than the minimum segment length or longer than the maximum segment length, the insert is not performed. If the layout length is valid, its length is assigned to the new segment occurrence.

Refer to "Variable Length Segments" on page 2-50 for additional information on editing variable length segments in Unformatted mode.

Edit Index Mode

The Index screen provides an index of the segments in a database. It displays one segment occurrence per line in character format as shown in Figure 2-15.

Figure 2-15. Index Screen

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- COLS 00001 00060
COMMAND ==>> SCROLL ==> CUR
LEVEL --SEG-- ----+----1----+----2----+----3----+----4----+----5----+----6
--- 1  ORDR010  AA4444HIGH PERFORMANCE COAX          CN0033.....n.H
--- 2  ORDR020  ..01POOPEN  C12223GREY COAX          EAQQRRAA444
--- 3  ORDR030  01QA... .. .OKGRINDING          1988021419880306
--- 3  ORDR030  04WA.....BDFINISHING          19880902
--- 3  ORDR030  05WD.....OKTESTING          1988090519880912
--- 2  ORDR020  ..02WOOPEN  C44567CEMENTING PROCEDURE          INSF44-01D
--- 2  ORDR020  .>04WOOPEN  U224AB2400 BAUD MODEM KIT          OVEA10098SY
--- 2  ORDR020  01C12223RM...BSSCRAP          Y19880912
--- 2  ORDR020  CN00330101.....19881012          RD8... .. OVEA02033BE
--- 2  ORDR020  CN00330202.....19881012          RD8... ..
--- 1  ORDR010  AA8888TERMINAL ACCESORIES          CN0055..... n.W
--- 2  ORDR020  ..01POOPEN  U248AB4800 BAUD MODEM KIT          EAWXWAA222
--- 3  ORDR030  01QA.....OKMILLING CMLPTE 1988021419880306
--- 3  ORDR030  04ER.....OKPOLISHING          19880902
--- 3  ORDR030  05GG.....OKPAINTING          1988090819880902
--- 2  ORDR020  ..02PCLOSED C12222BLUE COAX          EATITTA666
--- 3  ORDR030  01WZ.....OKPRIMING          1988031419880306
--- 3  ORDR030  05RZ.....OKFIRMING CMLPTE 1988061219880706
--- 3  ORDR030  12QA.....OKPOLISHING          1988071219880706

PF1-MENU 2-DBD 3-END 7-UP MAX 8-DOWN 9-PAR 10-LEFT 11-RIGHT 12-ROOT

```

You can access this screen from the Data Base Location, Formatted, Unformatted, or Key Specification screen. The first segment occurrence shown in the screen body is always the current segment occurrence in the database. The second through last lines shown in the screen body contain those segments that hierarchically follow the current segment in the database.

The UP MAX, DOWN, KEY, PARENT, and ROOT commands enable you to change your current segment position to another segment occurrence in the database. The LEFT and

RIGHT commands enable you to move through the contents of the segments displayed in the screen body.

Level : Displays the hierarchical level number for each segment on the screen.

SEG : Shows the segment name for each displayed segment.

Note: For terminal related MSDBs and non-terminal related MSDBs with terminal related keys, SEG shows the logical terminal name (the segment's key) instead of the segment name.

The remainder of the screen body displays up to 60 characters of each segment displayed on the screen. You can use left and right scrolling to view the contents of segments longer than 60 characters. Non-displayable characters are represented by a period. A high intensity BOTTOM OF DATA BASE line is displayed after the last segment occurrence in the database.

To change the contents of any of the segments displayed in the screen body, simply type over the positions you want to change. All segments with changes are replaced in the database with the next valid keyboard interaction (ENTER or a PF key is pressed).

Each valid keyboard interaction initiated from Index mode causes File-AID *for IMS* to start its segment replace sequence. Each currently displayed segment is scanned, starting with the first (current) segment at the top of the screen body and proceeding segment by segment to the last segment displayed. Segments that were updated are replaced in the database. Any error detected by File-AID *for IMS* causes the replace sequence to terminate. Updated segments on the display prior to the segment in error are successfully replaced in the database. Updated segments on the display following the segment in error are not replaced in the database until the segment in error is corrected. Changes made to the segments below the segment in error continue to be reflected on the display.

Following are some common errors that File-AID *for IMS* detects during its replace sequence:

- The key value for a segment was typed over. IMS does not enable the key of an existing segment to be changed.
- Data beyond the end of a fixed length segment was typed over.
- Data beyond the defined maximum length of a variable length segment was typed over.

In all type over error situations, correct the type over error or use the CANCEL primary command to restore unprocessed segment contents to their prior values.

You can increase the length of a variable length segment by typing characters beyond the segment's current length. In this situation, File-AID *for IMS* automatically adjusts the segment length to the position of the last non-blank character on that segment line. You cannot decrease segment lengths by deleting existing characters. Also, you cannot type over the two-byte field that describes the current length of a variable length segment.

Because the Index screen always displays segments in character format, you are not able to enter the hexadecimal representation of data fields while in Index mode. To do so, select a segment and switch to Formatted or Unformatted mode.

Edit Index Primary Commands

All the primary commands described on page 2-9 can be used in Index mode. References to the current segment position by the KEY, PARENT, and ROOT commands apply to the first segment displayed in Index mode. The following primary commands can also be used:

CANCEL : Cancels changes made to displayed segments (Edit only).

DOWN : Scrolls toward end of database.

LEFT : Scrolls toward beginning of displayed segments.

REFRESH : Retrieves current version of first displayed segment that contain type overs (Edit only).

RIGHT : Scrolls toward end of displayed segments.

UP MAX : Scrolls to top of database.

CANCEL Command (Edit only)

The CANCEL command is used in Index mode to reverse the type overs made to the segments displayed. For example, if you decide after you type over data within different segments on the display that you want to see the original contents of those segments, use the CANCEL command. Any changes made to the segments displayed can be cancelled until the next keyboard interaction. Once a keyboard interaction is performed, including pressing ENTER, File-AID *for IMS* starts its segment replace sequence. The CANCEL command has no affect if you type over data in several segments, press ENTER, and then enter the CANCEL command.

If File-AID *for IMS* encounters an error in a segment during its segment replace sequence, the segment replace sequence stops. You can then use the CANCEL command to restore the segment in error and the segments below it to their original contents.

DOWN Command

The DOWN command, along with UP MAX, enables you to control which segments in a database are currently displayed in the screen body. DOWN causes File-AID *for IMS* to scroll hierarchically toward the end of a database. Each time you scroll down, a new segment occurrence becomes the current segment displayed at the top of the screen body.

LEFT Command

The LEFT command enables you to move toward the left margin of the segments displayed in Index mode. LEFT causes File-AID *for IMS* to move toward the beginning of the segments displayed. The 60-position portion of the segments currently displayed is indicated by the starting and ending column numbers shown in the first heading line. The column finder line also changes as you move left.

REFRESH Command (Edit only)

The REFRESH command is used to retrieve the most current version of the first displayed segment with type overs. When the Integrity Check feature is active and a segment that contains type overs is updated by a concurrent user, the REFRESH command is required. After issuing the REFRESH command, only the first segment that contain type overs is replaced with its current version.

There are no operands associated with the REFRESH command.

RIGHT Command

The RIGHT command enables you to move toward the right margin of the segments displayed in Index mode. RIGHT causes File-AID *for IMS* to move toward the end of the segments displayed. The 60-position portion of the segments currently displayed is indicated by the starting and ending column numbers displayed in the first heading line. The column finder line also changes as you move right.

UP MAX Command

The UP MAX command, along with DOWN enables you to control which segments in a database are currently displayed in the screen body. Because IMS cannot retrieve segments in hierarchically backward sequence, the UP command must always be entered

with the max operand. UP MAX causes File-AID *for IMS* to retrieve the first root segment in the database and display it as the current segment on the first line of the screen body. The remainder of the screen body is filled with a hierarchical listing of the segments following the first root segment.

Line Commands

Line commands are entered in the two-position field next to the appropriate segment line. Line commands enable you to insert, delete, and repeat segments; to change your current position in a database; and to select segments for Formatted or Unformatted editing. Following are the valid Index mode line commands:

Browse/Edit Mode

K : Displays the Key Specification screen
 S : Enters the Formatted mode
 SU : Enters the Unformatted mode

Edit Mode Only

I : Insert
 D : Delete
 R : Repeat
 RA : Repeat All

The following rules apply to the use of line commands:

- Only one occurrence of the I, R, RA, K, S, or SU command can be entered at one time.
- Any number of D line commands can be entered simultaneously, with or without an occurrence of one of the other line commands.
- D line commands are processed before any other line command.
- No other line command can be entered on any dependent segment line when a D line command is entered on a segment line.
- The next hierarchical segment occurrence after the last segment deleted becomes the new current segment if all of the segments currently displayed are deleted at the same time.
- Any line commands entered at the same time as a CANCEL primary command are ignored. The CANCEL primary command is always executed before processing the remainder of the screen.
- A primary command is ignored if the K, S, or SU line command is entered with any primary command other than CANCEL.
- Other line command and primary command combinations are valid. Line commands are always processed before the primary command, except as noted for CANCEL.

Key (K) Command

The K line command enables you to change your position in a database from the current segment position to any other segment position. You can enter the K line command next to any segment displayed on the Index screen. After K is entered and ENTER is pressed, the Key Specification screen is displayed, showing the key values for each segment type in the hierarchical path to the segment where the K was entered. On the Key Specification screen, you can specify key values for any of the displayed Key Value fields. You can reposition only to another occurrence of the same segment type as the segment where K was entered. Upon returning to the Index screen, the segment whose fully

concatenated key was specified becomes the new current segment displayed on the first line of the screen body.

Refer to page “Key Specification” on page 2-34 for an explanation of how to use the Key Specification screen.

Select Formatted (S) Command

The S line command enables you to select any segment occurrence on the Index screen and switch to Formatted mode with that segment. When you enter Formatted mode with your selected segment, that segment becomes the new current segment.

Select Unformatted (SU) Command

The SU line command enables you to select any segment occurrence on the Index screen and switch to Unformatted mode with that segment. When you enter Unformatted mode with your selected segment, that segment becomes the new current segment.

Insert (I) Command (Edit only)

The I line command enables you to insert a single occurrence of any segment type displayed on the Index screen. You can enter the I line command next to any segment displayed on the screen. The segment type inserted is restricted to the same segment type as the segment line where the command was entered. After I is entered and ENTER pressed, the Key Specification screen is displayed. On the Key Specification screen, you can specify the fully concatenated key of the segment to be inserted. When you leave the Key Specification screen and return to the Index screen, the new segment is inserted in the database.

The execution of an insert line command does not cause your current segment position to change. If, according to the fully concatenated key specified on the Key Specification screen, the newly inserted segment fits onto the display under the current segment, the new segment is displayed when you return to the Index screen. If the new segment does not fit into the current hierarchy displayed, the segment is inserted in the database but not displayed on the Index screen.

When inserting a segment, File-AID *for IMS* first attempts to do a formatted insert (as described in “INSERT Command (Edit only)” on page 2-24). The following instances prevent File-AID *for IMS* from performing a formatted insert:

- The segment layout for the segment type to be inserted was not successfully defined to File-AID *for IMS* using the Batch XREF Update Facility.
- When inserting a multiple record type segment (one defined by multiple segment layouts), File-AID *for IMS* validates the record type values contained in the segment on the line where the I command was entered. If the record type values are valid, the corresponding segment layout defined to File-AID *for IMS* using the Batch XREF Update Facility is used for a formatted insert and the record type values are pre-formatted in the new segment. If the record type values are not valid, the formatted insert is not performed.
- If the segment being inserted is fixed length and the corresponding segment layout does not match the segment’s length.
- If the segment being inserted is variable length and the corresponding segment layout is either shorter than the segment’s minimum length or longer than the segment’s maximum length.

When File-AID *for IMS* cannot perform a formatted insert of the new segment, it performs an unformatted insert as described in “INSERT Command (Edit only)” on page 2-24.

Delete (D) Command (Edit Only)

The D line command enables you to delete segment occurrences from a database while in Index mode. You can enter the D line command next to any segment displayed on the screen. When D is entered, the segment and all dependent segment occurrences are deleted. If you delete the first segment displayed (the current segment), the next segment occurrence that is not a dependent of the first segment becomes the new first segment displayed (the new current segment). If you delete the last segment displayed, the next segment occurrence that is not a dependent of the last segment appears on the last segment line.

If the Integrity Check feature is active and the segment was updated by a concurrent user, File-AID for IMS automatically displays the current version of the segment again. This process enables you to review the current segment before deleting it.

Repeat (R) Command (Edit only)

The R line command enables you to repeat any single segment occurrence in a database. You can enter the R line command next to any segment displayed on the screen. The segment line where you enter the R is the segment occurrence that is repeated. After R is entered and ENTER is pressed, the Key Specification screen is displayed showing the key values for each segment type in the hierarchical path to the segment where R was entered. On the Key Specification screen, you can specify the fully concatenated key for the new segment to be created. Upon returning to the Index screen, the new segment is inserted. All non-key field data in the new segment are copied from the segment where R was entered.

Your current position does not change when you execute an R line command in Index mode. When you return to the Index screen from the Key Specification screen, the newly created segment may or may not be displayed, depending on the fully concatenated key specified.

Repeat All (RA) Command (Edit only)

The RA line command enables you to repeat any hierarchical substructure in a database. You can enter the RA line command next to any segment displayed on the screen including a root segment. The segment line where RA is entered is the parent of the hierarchical substructure to be repeated. After RA is entered and ENTER is pressed, the Key Specification screen is displayed showing the key values for each segment type in the hierarchical path to the segment where RA was entered. On the Key Specification screen, you can specify the fully concatenated key for the parent of the new hierarchical substructure to be created. Upon returning to the Index screen, the new parent segment and its substructure are inserted. All nonkey field data in the new parent segment are copied from the segment where the RA was entered. All data in the children under the new parent are copied from the children under the segment where RA was entered.

Your current position does not change when you execute an RA line command in Index mode. When you return to the Index screen from the Key Specification screen, the newly created parent segment may or may not be displayed, as well as some or all of its children, depending on the fully concatenated key specified.

Key Specification

The Key Specification screen is used to specify the fully concatenated key of a segment occurrence that you want to retrieve or create. This screen can be invoked from any of the following four screens within the Browse or Edit function:

- From the Data Base Location screen with the K, KU, or KI line command or the INSERT primary command (refer to “Selecting a Segment” on page 2-6).

- From the Formatted screen with the KEY, INSERT, or REPEAT primary command (refer to “Common Edit Primary Commands” on page 2-9 and “Common Formatted/Unformatted Primary Commands” on page 2-12).
- From the Unformatted screen, with the KEY, INSERT, or REPEAT primary command.
- From the Index screen with the KEY primary command or the Insert, Key, Repeat, or Repeat All line command. The KEY primary command is described on page 2-11 and Line commands are described on page 2-32.

Examples of how each of these screens interacts with the Key Specification screen are described on page 2-38.

Figure 2-16. Key Specification Screen

```

KEY SPEC --- (LORDR - ORDER DB - LOGICAL VIEW) ----- SPECIFY KEY TO RETRIEVE
COMMAND ===>                                         SCROLL ===> PAGE
SEGMENT TO RETRIEVE: ORDR040 ORDER SCRAP
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- RO -----FIELD VALUE-----
LVL 1 ORDR010                                     EQ
  05 ORDER-ROOT-KEY
    07 ORDER-NUMBER-PREFIX           C  2  K   AA
    07 ORDER-NUMBER                 Z  4  K   2222
-----
LVL 2 ORDR040                                     EQ
  05 SCRAP-KEY
    07 PROCESS-INDICATOR             C  2  K   01
    07 PART-NUMBER                   C  6  K   C7477A
***** END OF KEY *****

Enter END command when the key value has been fully specified
Enter CANCEL command to terminate Key Specification without processing the key
PF3-END 7-UP 8-DOWN

```

Segment to Retrieve : Displays the segment name of the target segment type and its description from the segment/layout cross reference dataset. The last segment type shown in the screen body is referred to as the target segment type. If you used a KEY, INSERT, or REPEAT to enter the Key Specification screen, the target segment type is the same as the current segment type. If you used a line command, the target segment type is the same as that of the segment on the line where the line command was entered. The target segment is always the segment that you want to retrieve, insert or repeat.

Level Number/Data-Name : The first line in the first column of each section starts with the literal LVL and the hierarchical level number within the primary database of the segment type corresponding to that section. Next to the level number is the segment name.

The remaining lines in the first column of each section display the segment layout level numbers and data-names that define the key fields for that section’s segment type. Where possible, File-AID *for IMS* shows the level numbers and data-names from the segment layout that defines the segment type. If a valid segment type cannot be found or determined, File-AID *for IMS* generates a generic key field name in the format *segment-name KEY*, where segment-name is the name of the segment type for that section. File-AID *for IMS* also assigns a level number of 01 to generated key field names. The “Key Specification Screen” on page 2-35, Figure 2-16, is an example of key field name generation.

FORMAT : The Format column serves the same purpose on the Key Specification screen as on the Formatted screen. Refer to Figure 2-9 on page 2-18.

RO : Used by File-AID *for IMS* to retrieve, insert, or repeat the target segment. The SSAs used in the DL/I call are formatted using the relational operator specified for each segment type. Following are the valid relational operators:

EQ or =	Equal
GT or >	Greater than
LT or <	Less than
GE or >= or =>	Greater than or equal to
LE or <= or =<	Less than or equal to
NE or \neq or \neq	Not equal
UQ	Unqualified

With the exception of UQ, the relational operators are similar to the ones used when coding an SSA in an IMS application program. File-AID *for IMS* uses the specified relational operator when issuing its DL/I calls. The UQ relational operator is unique to File-AID *for IMS*. When UQ is specified for a segment type, File-AID *for IMS* formats an unqualified SSA for that segment type.

Upon entry to the Key Specification screen, File-AID *for IMS* preformats the RO column for each segment type with either an EQ or a UQ as follows:

FIELD VALUE :

EQ	When a segment type is in the current hierarchical path and in the hierarchical path to the target segment.
UQ	When a segment type is in the hierarchical path to the target segment but not in the current hierarchical path.

Upon entry to the Key Specification screen, the current values of each segment type in the current hierarchical path are preformatted in the Field Value column. When segment types are in the hierarchical path to the target segment but not in the current hierarchical path, Field Value is preformatted with blanks (HEX 40s).

Up to 30 characters or 10 hexadecimal positions can be entered in Field Value. The valid syntax to specify key values is the same as described in "Field Value" on page 2-19. File-AID *for IMS* validates the length of the key value entered against the key length shown in the Format column for that line. If the value entered is shorter than the Format column's key length, File-AID *for IMS* pads the value with blanks (HEX 40s). If the value entered is longer, an error is returned.

In the following situations, File-AID *for IMS* deviates from its normal relational operator and Field Value pre-formatting:

- When the INSERT primary command is used to insert a target segment type that is not in the current hierarchical path, the target's relational operator is set to EQ and its key field to blanks.
- Non-keyed segment types always have UQ as a relational operator and the literal *** NON-KEYED SEGMENT *** in the Field Value column.
- When the Key Specification screen is entered from the Data Base Location screen with a K, KU, or KI line command, the RO column is set to EQ for all segment types displayed. The key values shown for each segment type are taken directly from the Key Value column on the Data Base Location screen. Refer to "Selecting a Segment" on page 2-6 for more detail on how File-AID *for IMS* maintains key values on the Data Base Location screen.

The last line in the screen body always contains an END OF KEY literal.

Primary Commands

The only commands available on the Key Specification screen are primary commands. Many of the commands work exactly as on other File-AID *for IMS* screens.

CANCEL Command

The CANCEL command terminates the key specification process and returns you to the screen you were on when you invoked the Key Specification screen. Any changes made on the Key Specification screen are cancelled, leaving your current segment position unchanged. Upon return to the originating screen, the message "COMMAND CMD CANCELED" is displayed, where command can be KEY, INSERT, or REPEAT.

CAPS Command

The CAPS command works the same on the Key Specification screen as described in "Common Edit Primary Commands" on page 2-9.

DOWN Command

The DOWN command enables you to control which key values in the hierarchical path to the target segment are displayed on the Key Specification screen. DOWN causes File-AID *for IMS* to scroll from the direction of the root segment's key toward the target segment's key.

END Command

The END command is used when you complete the specification of the fully concatenated key to the target segment. END causes File-AID *for IMS* to process your KEY, INSERT, or REPEAT request. If the request is successful, you are returned to the screen you were on when you entered the request. If the request cannot be completed, the appropriate error message is returned, and you remain on the Key Specification screen.

LOCATE Command

The LOCATE command enables you to scroll the key values that represent the hierarchical path to the target segments, either moving toward the root segment's key or toward the target segment's key.

You must enter the line-number operand when using the LOCATE command. File-AID *for IMS* scrolls the body of the display to the line number entered. The line-number operand must be in the range 1 to 2,147,483,647. The first line currently displayed in the screen body is shown in LINE NUMBER on the first screen heading line. If the line-number operand entered is greater than the line number of the last line in the fully concatenated key, File-AID *for IMS* scrolls to the last line.

The data-name operand of the LOCATE command is not supported on the Key Specification screen.

TOG Command

If a PL/I layout defines a 31 digit numerical field, it is possible that the entire field might not fit on a single screen. The TOG primary command (which is assigned to the PF11 key) enables you to toggle to an alternate display where the entire field is displayed on one screen. Issuing the TOG command on this screen displays the original screen.

The message, "USE PF11 FOR OVER 30DIG" is displayed when the display of a field is truncated.

UP Command

The UP command enables you to control which key values in the hierarchical path to the target segment are displayed on the Key Specification screen. UP causes File-AID for IMS to scroll from the direction of the target segment's key toward the root segment's key.

Key Specification Examples

You can invoke the Key Specification screen from the following four screens in the edit conversation.

1. Data Base Location screen with the K line command.
2. Formatted screen with the REPEAT command.
3. Unformatted screen with the INSERT command.
4. Index screen with the RA line command.

Each of the following four figures shows an example of the Key Specification process as initiated from one of the four screens.

Example 1 - K Line Command

The first example shows the use of the K line command on the Data Base Location screen. The Key Specification screen is displayed to enable you to specify the segment to be retrieved. After the key is fully specified, the segment is displayed in Formatted mode.

In Figure 2-17 on page 2-38, the Data Base Location screen is shown with the current segment positioned on an occurrence of the ORDR030 segment type. When a K line command is entered on the ORDR010 root segment line, the Key Specification screen shown in Figure 2-18 on page 2-39 is displayed.

Figure 2-17. Initial Key Specification Screen - K Line Command

```

----- EDIT - DATA BASE LOCATION ----- LINE 00001
COMMAND ==>                               SCROLL ==> CUR

LINE
CMD  ----LEVEL----- --SEG--- --DESCRIPTION-- LTH  -----KEY-----
K_*  1 DBD-PORDR      ORDR010 ORDER ROOT      006 AA2222
---*  2                ORDR020 ORDER LINE      002 01
---*  3                ORDR030                002 03
---  2                ORDR040 ORDER SCRAP      008
---  2                ORDR050 ORDR-CUST LCHLD 002
                        *** END OF SEGMENT LIST ***

S -- Select Formatted           K -- Key Spec, then Select Formatted
SU -- Select Unformatted        KU -- Key Spec, then Select Unformatted
SI -- Select Index of Segments  KI -- Key Spec, then Select Indexed
PF1-MENU 2-DBD 3-END 7-UP 8-DOWN52

```

Figure 2-18. Initial Key Specification Screen - K Line Command

```

KEY SPEC --- (PORDR - PHYSICAL ORDER DATA BASE) ----- SPECIFY KEY TO RETRIEVE
COMMAND ===>
SEGMENT TO RETRIEVE: ORDR010 ORDER ROOT
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- RO -----FIELD VALUE-----
LVL 1 ORDR010
    05 ORDER-ROOT-KEY
        07 ORDER-NUMBER-PREFIX          C  2  K   AA
        07 ORDER-NUMBER                 Z  4  K   2222
*****      END OF KEY      *****

Enter END command when the key value has been fully specified
Enter CANCEL command to terminate Key Specification without processing the key
PF3-END 7-UP 8-DOWN

```

On the initial Key Specification screen, the relational operator for the ORDR010 segment is changed from EQ to > and the END command is entered as shown in Figure 2-19 on page 2-39. When ENTER is pressed, File-AID *for IMS* and IMS to search for the first ORDR010 segment occurrence with a key value greater than AA2222.

Figure 2-19. Key Specification Screen with Key Value Specified

```

KEY SPEC --- (PORDR - PHYSICAL ORDER DATA BASE) ----- SPECIFY KEY TO RETRIEVE
COMMAND ===> END
SEGMENT TO RETRIEVE: ORDR010 ORDER ROOT
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- RO -----FIELD VALUE-----
LVL 1 ORDR010
    05 ORDER-ROOT-KEY
        07 ORDER-NUMBER-PREFIX          C  2  K   AA
        07 ORDER-NUMBER                 Z  4  K   2222
*****      END OF KEY      *****

Enter END command when the key value has been fully specified
Enter CANCEL command to terminate Key Specification without processing the key
PF3-END 7-UP 8-DOWN

```

An ORDR010 segment with a key of AA4444 is found and displayed in Formatted mode as shown in Figure 2-20 on page 2-40.

Figure 2-20. Formatted Screen with New Current Segment

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- SUCCESSFUL KEY CMD
COMMAND ===> SCROLL ===> CUR
PAR
SEG ORDR010 ORDER ROOT      CONCAT KEY: AA4444
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- -----FIELD VALUE-----
01 ORDER-ROOT-DATA
  05 ORDER-ROOT-KEY
    07 ORDER-NUMBER-PREFIX      C  2  K  AA
    07 ORDER-NUMBER             Z  4  K  4444
  05 ORDER-DESCRIPTION          C  40  HIGH PERFORMANCE COAX
      (POS 31-40)
  05 CUSTOMER-NUMBER            C  6  CN0033
  05 PLANNED-ORDER-QUANTITY     PS  5  550
  05 PLANNED-ORDER-AMOUNT       P  5  2  5209.58
  05 ORDER-TYPE                  C  2  HI
  05 ACTUAL-ORDER-QUANTITY      PS  5  51
  05 TOTAL-SCRAP-QUANTITY       PS  5  INVALID X'F04040'
  05 TOTAL-SCRAP-REDEFINES      RDEFINES TOTAL-SCRAP-QUANTITY
      C  3  0
  05 ORDER-STATUS               Z  2  03
  05 FILLER                      C  1
  05 FIRST-ACTIVITY-DATE

PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT

```

Example 2 - REPEAT Command

The second example illustrates how an existing segment occurrence can be copied.

In Figure 2-21 on page 2-40 the current segment position on the Formatted screen is ORDR020 segment with a key of 01 under the ORDR010 root with a key of AA2222. A REPEAT command is entered, and the Key Specification screen shown in Figure 2-22 on page 2-41 is displayed.

Figure 2-21. REPEAT Command on the Formatted Screen

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- LINE 00001
COMMAND ===> REPEAT SCROLL ===> CUR
PAR ORDR010 ORDER ROOT      RCD TYP1: PO
SEG ORDR020 ORDER LINE     CONCAT KEY: AA2222,01
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- -----FIELD VALUE-----
01 ORDER-LINE-DATA-PO
  05 SEGMENT-LENGTH             BS  4  178
  05 ORDER-LINE-KEY
    07 LINE-NUMBER              C  2  K  01
    05 ORDER-TYPE                C  2  PO
  05 LINE-STATUS                 C  7  OPEN
  05 PART-NO                     C  6  C7477A
  05 DESCRIPTION                  C  30  BLACK COAXIAL CABLE
  05 UNIT-OF-MEASURE             C  2  EA
  05 PURCHASE-ORDER-INFO
    07 PO-CODE                   C  4  WXWW
    07 PO-NUMBER                 C  12  AA2222-22
    07 PO-COMPANY                C  30  ZENITH WIRE
    07 PO-VENDOR-NUMBER          C  5  2224
    07 PO-VENDOR-CODE            C  5  34552
  05 FILLER                      C  30
  05 ORDER-QUANTITIES

PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT

```


Figure 2-22. Initial Key Specification Screen - REPEAT Command

```

KEY SPEC --- (PORDR - PHYSICAL ORDER DATA BASE) -----SPEC KEY FOR REPEAT
COMMAND ==> SCROLL ==> CUR
SEGMENT TO REPEAT: ORDR020 ORDER LINE
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- R0 -----FIELD VALUE-----
LVL 1 ORDR010 EQ
  05 ORDER-ROOT-KEY
  07 ORDER-NUMBER-PREFIX C 2 K AA
  07 ORDER-NUMBER Z 4 K 2222
-----
LVL 2 ORDR020 EQ
  05 ORDER-LINE-KEY
  07 LINE-NUMBER C 2 K 01
***** END OF KEY *****

Enter END command when the key value has been fully specified
Enter CANCEL command to terminate Key Specification without processing the key
PF3-END 7-UP 8-DOWN

```

On the initial Key Specification screen, a new key of 05 is specified for the ORDR020 segment to be created as a result of the REPEAT command under the ORDR010 segment with a key of AA2222, and the END command is entered as shown in Figure 2-23 on page 2-41. File-AID for IMS and IMS copies the data from the ORDR020 segment with a key of 01 under the ORDR010 root with a key of AA2222 and inserts the new segment. After the repeat is performed the new ORDR020 segment becomes the current segment as shown on the Formatted screen in Figure 2-24 on page 2-42.

Figure 2-23. Specifying the Key for the Target Segment of the REPEAT Command

```

KEY SPEC --- (PORDR - PHYSICAL ORDER DATA BASE) -----SPEC KEY FOR REPEAT
COMMAND ==> END SCROLL ==> CUR
SEGMENT TO REPEAT: ORDR020 ORDER LINE
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- R0 -----FIELD VALUE-----
LVL 1 ORDR010 EQ
  05 ORDER-ROOT-KEY
  07 ORDER-NUMBER-PREFIX C 2 K AA
  07 ORDER-NUMBER Z 4 K 2222
-----
LVL 2 ORDR020 EQ
  05 ORDER-LINE-KEY
  07 LINE-NUMBER C 2 K 05
***** END OF KEY *****

Enter END command when the key value has been fully specified
Enter CANCEL command to terminate Key Specification without processing the key
PF3-END 7-UP 8-DOWN

```

Figure 2-24. Formatted Screen - Positioned on New Segment

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) -----SUCCESSFUL REPEAT CMD
COMMAND ==> SCROLL ==> CUR
PAR ORDR010 ORDER ROOT RCD TYP1: PO
SEG ORDR020 ORDER LINE CONCAT KEY: AA2222,01
-----LEVEL NUMBER/DATA-NAME-----FORMAT-----FIELD VALUE-----
01 ORDER-LINE-DATA-PO
05 SEGMENT-LENGTH BS 4 178
05 ORDER-LINE-KEY
07 LINE-NUMBER C 2 K 05
05 ORDER-TYPE C 2 PO
05 LINE-STATUS C 7 OPEN
05 PART-NO C 6 C7477A
05 DESCRIPTION C 30 BLACK COAXIAL CABLE
05 UNIT-OF-MEASURE C 2 EA
05 PURCHASE-ORDER-INFO
07 PO-CODE C 4 WXWW
07 PO-NUMBER C 12 AA2222-22
07 PO-COMPANY C 30 ZENITH WIRE
07 PO-VENDOR-NUMBER C 5 2224
07 PO-VENDOR-CODE C 5 34552
05 FILLER C 30
05 ORDER-QUANTITIES

PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT52
    
```

Example 3 - INSERT Command

The third example illustrates how a new segment can be inserted into a database.

In Figure 2-25 on page 2-42, the current segment position on the Unformatted screen is the ORDR010 segment with a key value of AA2222. An INSERT command is entered with ORDR030 as the segment-name operand. The Key Specification screen shown in Figure 2-26 on page 2-43 is displayed.

Figure 2-25. INSERT Primary Command on Unformatted Screen

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) -----
COMMAND ==> INSERT ORDR030 SCROLL ==> CUR
PAR
SEG ORDR010 ORDER ROOT CONCAT KEY: AA2222
SEG LENGTH ==> 167
-----1-----2-----3-----4-----5-----6-----7
1 AA2222INDUSTRIAL GRADE COAXIAL CABLE CN0001.&....WS ...01<
CCFFFCDCCEEEEDCCD4DC4EDDECCDC4444444444444444CDFFFFF0500578EE444000FF4
112222954423991307914502667913031235000000000035000100C365F6200001C01C
-----+-----*-----+-----*-----+-----*-----+-----*-----+-----*
71 1988080319880914.....p.....p.....
FFFFFFFFFFFFFFFFF010010004990049900000000130001300040040012000120000000
198808031988091402F02F0087C0087C01F01F0023C0023C02F02F0064C0064C00F00F
-----+-----*-----+-----*-----+-----*-----+-----*
141 .....B
000000000000000000000000000000000000C
0000C0000C00F00F0000C0000C2

PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT
    
```

Figure 2-26. Initial Key Specification Screen - INSERT Command

```

KEY SPEC --- (PORDR - PHYSICAL ORDER DATA BASE) -----SPEC KEY FOR INSERT
COMMAND ===>                                     SCROLL ===> CUR
SEGMENT TO RETRIEVE: ORDR030
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- RO -----FIELD VALUE-----
LVL 1 ORDR010                                     EQ
  05 ORDER-ROOT-KEY
    07 ORDER-NUMBER-PREFIX           C  2  K   AA
    07 ORDER-NUMBER                 Z  4  K   2222
-----
LVL 2 ORDR020                                     UQ
01 * ORDR020 KEY*                           C  2  K
-----
LVL 3 ORDR030                                     EQ
01 * ORDR030 KEY *                           C  2  K
***** END OF KEY *****

Enter END command when the key value has been fully specified
Enter CANCEL command to terminate Key Specification without processing the key
PF3-END 7-UP 8-DOWN52

```

On the Key Specification screen shown in Figure 2-27 on page 2-43, the relational operator for the ORDR020 segment type is changed from UQ to EQ and a key value of 01 is specified. A key of 05 is entered for the ORDR030 segment type and the END command is entered. This process causes File-AID *for* IMS and IMS to insert a new occurrence of the ORDR030 segment with a key of 05 under the existing ORDR010 and ORDR020 segments with keys of AA2222 and 01, respectively. After the insert is complete, the new ORDR030 segment becomes the current segment as shown on the Unformatted screen in Figure 2-28 on page 2-44.

Figure 2-27. Specifying the Key for the Segment to be Inserted

```

KEY SPEC --- (PORDR - PHYSICAL ORDER DATA BASE) -----SPEC KEY FOR INSERT
COMMAND ===> END                                     SCROLL ===> CUR
SEGMENT TO RETRIEVE: ORDR030
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- RO -----FIELD VALUE-----
LVL 1 ORDR010                                     EQ
  05 ORDER-ROOT-KEY
    07 ORDER-NUMBER-PREFIX           C  2  K   AA
    07 ORDER-NUMBER                 Z  4  K   2222
-----
LVL 2 ORDR020                                     EQ
01 * ORDR020 KEY*                           C  2  K   01
-----
LVL 3 ORDR030                                     EQ
01 * ORDR030 KEY *                           C  2  K   05
***** END OF KEY *****

Enter END command when the key value has been fully specified
Enter CANCEL command to terminate Key Specification without processing the key
PF3-END 7-UP 8-DOWN

```

Figure 2-28. Unformatted Screen

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- SUCCESSFUL INSERT CMD
COMMAND ==> SCROLL ==> CUR
PAR ORDR020 ORDER LINE
SEG ORDR030          CONCAT KEY: AA2222,01,05
SEG LENGTH ==> 167
      +-----1-----2-----3-----4-----5-----6-----7
1 05
  FF44444444444444444444444444444444444444444444444444444444444444
  0500000000000000000000000000000000000000000000000000000000000000

PF1-MENU 2-DBD 3-END 4-NEXT 5-CHILD 6-TWIN 7-UP 8-DOWN 9-PAR 12-ROOT
  
```

Example 4 - RA Line Command

The fourth example illustrates how a segment occurrence and all its dependents can be copied using the RA line command.

In Figure 2-29 on page 2-44, an RA line command is entered on the ORDR010 segment line at the top of the Index screen body. The Key Specification screen shown in Figure 2-30 on page 2-45 is displayed.

Figure 2-29. RA Line Command on the Index Screen

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- COLS 0001 00060
COMMAND ==> SCROLL ==> CUR
  LEVEL  --SEG--  +-----1-----2-----3-----4-----5-----6
RA 1      ORDR010 CC1111COAXIAL CABLE - BULK          CN0099.....6
--- 2      ORDR020 ..01PCLOSD C7477WHITE COAX          EA22  PO-C1
--- 3      ORDR030 01QA... ..OKMILLING CMLPTE 1988921419880306
--- 2      ORDR020 .>02WOOPEN X123EWDIODE          OVEA12230R0
--- 2      ORDR020 ..04WOOPEN P234-2          INLBW222-2S
--- 2      ORDR040 01P321-5 ....          19881002
--- 2      ORDR050 CN00990101.....          0.....
--- 2      ORDR050 CN00990202.....          0.....
          ***** BOTTOM OF DATA BASE *****

PF1-MENU 2-DBD 3-END 7-UP MAX 8-DOWN 9-PAR 10-LEFT 11-RIGHT 12-ROOT52
  
```

Figure 2-30. Initial Key Specification Screen - RA Line Command

```

KEY SPEC --- (PORDR - PHYSICAL ORDER DATA BASE) ----- SPEC KEY FOR REPEAT
COMMAND ===>                                     SCROLL ===> CUR
SEGMENT TO REPEAT: ORDR010 ORDER ROOT
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- RO -----FIELD VALUE-----
LVL 1 ORDR010                                     EQ
    05 ORDER-ROOT-KEY
        07 ORDER-NUMBER-PREFIX             C  2  K   CC
        07 ORDER-NUMBER                   Z  4  K  1111
*****      END OF KEY      *****

Enter END command when the key value has been fully specified
Enter CANCEL command to terminate Key Specification without processing the key
PF3-END 7-UP 8-DOWN

```

On the Key Specification screen shown in Figure 2-31 on page 2-45, a new key of CC2222 is specified for the ORDR010 segment to be created by the RA line command, and the END command is entered. This process causes File-AID *for IMS* and IMS to copy the data from the ORDR010 segment with a key of CC1111 and insert the new ORDR010 segment. Copies of the dependents of the CC1111 ORDR010 segment are also inserted under the CC2222 ORDR010 segment. The current position on the Index screen is not affected by the RA line command. The newly created substructure is seen under the original substructure as illustrated in Figure 2-32 on page 2-46.

Figure 2-31. RA Line Command - Specify Creation of Key to the Parent

```

KEY SPEC --- (PORDR - PHYSICAL ORDER DATA BASE) ----- SPEC KEY FOR REPEAT
COMMAND ===> END                                     SCROLL ===> CUR
SEGMENT TO REPEAT: ORDR010 ORDER ROOT
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- RO -----FIELD VALUE-----
LVL 1 ORDR010                                     EQ
    05 ORDER-ROOT-KEY
        07 ORDER-NUMBER-PREFIX             C  2  K   CC
        07 ORDER-NUMBER                   Z  4  K  2222
*****      END OF KEY      *****

Enter END command when the key value has been fully specified
Enter CANCEL command to terminate Key Specification without processing the key
PF3-END 7-UP 8-DOWN
52

```

Figure 2-32. Index Screen - New Substructure Displayed After Old One

```

EDIT --- (PORDR - PHYSICAL ORDER DATA BASE) ----- SUCCESSFUL REPEAT CMD
COMMAND ==> SCROLL ==> CUR
  LEVEL --SEG-- ----+----1----+----2----+----3----+----4----+----5----+----6
--- 1  ORDR010 CC1111COAXIAL CABLE - BULK CN0099.....G
--- 2  ORDR020 ..01PCLOSED C74777WHITE COAX EAWW PO-C1
--- 3  ORDR030 01QA... ..OKMILLING CMLPTE 1988021419880306
--- 2  ORDR020 ..02WOOOPEN X123EWDIODE OVEA12230RO
--- 2  ORDR020 ..04WOOOPEN P234-2 INLBW222-2S
--- 2  ORDR040 01P321-5 .... 19881002
--- 2  ORDR050 CN00998101..... 0.....
--- 2  ORDR050 CN0099202..... 0.....
--- 1  ORDR010 CC2222COAXIAL CABLE - BULK CN0099.....G
--- 2  ORDR020 ..01PCLOSED C74777WHITE COAX EAWW PO-C1
--- 3  ORDR030 01QA... ..OKMILLING CMLPTE 1988021419880306
--- 2  ORDR020 ..02WOOOPEN X123EWDIODE OVEA12230RO
--- 2  ORDR020 ..04WOOOPEN P234-2 INLBW222-2S
--- 2  ORDR040 01P321-5 .... 19881002
--- 2  ORDR050 CN00998101..... 0.....
--- 2  ORDR050 CN0099202..... 0.....
***** BOTTOM OF DATA BASE *****

PF1-MENU 2-DBD 3-END 7-UP MAX 8-DOWN 9-PAR 10-LEFT 11-RIGHT 12-ROOT

```

Optional IMS Functions

IMS provides a number of optional functions that can be used with your databases. Some of these optional functions impact *File-AID for IMS'* browse/edit processing. This section describes the affect of these optional functions on certain *File-AID for IMS* screens and commands.

Most of the IMS optional functions referenced in this section are described in the *IMS/ESA Administration Guide: DB*. You should refer to the this guide if you require information on when to use an optional function or how it works. This section describes only special *File-AID for IMS* processing associated with certain IMS optional functions.

Logical Relationships

File-AID for IMS can be used to browse databases, including those that contain recursive structures that are involved in any of the three types of logical relationships: unidirectional, bidirectional physically paired, or bidirectional virtually paired. There are no *File-AID for IMS* restrictions that affect browsing databases with logical relationships.

File-AID for IMS can be used to edit databases that are involved in any of the three types of logical relationships, including databases that contain recursive structures, based on the *File-AID for IMS* restrictions described in the following paragraphs. *File-AID for IMS* supports the editing of databases with logical relationships through physical DBDs or logical DBDs. When you want to edit a logical child segment, Compuware recommends that you use a logical DBD where the logical child has been defined as part of a concatenated segment. This process minimizes the impact of the insert, delete, and replace rule restrictions on logical children.

Virtual Logical Child Segments

When a bidirectional virtually paired logical relationship is implemented, a physical DBD is generated to define the physical hierarchy for the database that contains the logical parent segment type. As part of that physical DBD, a segment definition is included for the virtual logical child segment type. When you use this physical DBD to access the database, *File-AID for IMS* includes the virtual logical child segment type when it displays the segment types in the database (for example, on the Data Base Location screen or the Index screen). Because the virtual logical child is actually representing a real logical child

segment type, you can access and maintain real logical child segments through the corresponding virtual logical child segments when the logical parent's physical DBD is used.

When you access real logical child segments from the logical parent's viewpoint (through a physical DBD), the order that the real logical children are seen is determined by the key defined for the virtual logical child segment type. When you access concatenated segments from the logical parent's viewpoint (through a logical DBD), the order that the concatenated segments are seen is also determined by the virtual logical child's key. The key for a virtual logical child can consist of multiple, noncontiguous pieces of data. On any screen within File-AID *for IMS* where the key values of segments are shown, the key value for a virtual logical child that is comprised of multiple pieces of data is shown as one continuous key value.

For example, assume that the key to a virtual logical child consists of the data in positions 3 through 6, 25 through 27, and 11 through 15, respectively. File-AID *for IMS* collects the data to display the key value for the segment from the three different locations in the segment and places it into one 12 position key field. The order in which multiple pieces of key data are displayed in a key field is determined by the order of the sequence field statements for the virtual logical child in the DBD source code.

Insert, Delete, and Replace Rules

When logical child segments and their physical or logical parents are inserted, deleted, or updated, IMS validates the action based on the segments' RULES= operand in the physical DBDs that define the logical relationship. (The RULES= coding format and validation process are explained in the *IMS/ESA Administration Guide: DB*). Because File-AID *for IMS* maintains your databases through DL/I calls, the update rules validation process is performed by IMS for File-AID *for IMS* the same as for any application program.

When inserting a segment that is involved in a logical relationship, the insert rule coded for the destination parent segment (either a physical or logical parent) determines the validation that IMS performs. For example, you can insert a logical child segment only if the insert does not violate the destination parent's insert rule.

To prevent IMS from performing unintentional operations during editing, File-AID *for IMS* applies additional restrictions during the insertion of logical children and destination parents as described in the following table:

Table 2-1. Destination Parent's Insert Rule Restrictions

Rule	Restrictions	Other Remarks
P	None.	IMS requires that the destination parent be inserted through a physical path before any logical children can be connected to it.
L	A logical child can be inserted only when it is part of a concatenated segment.	File-AID <i>for IMS</i> provides this restriction because IMS inserts the destination parent if one does not already exist. Because the user does not have a view of the destination parent segment contents, this operation is prohibited.
V	Same as above.	When connecting a logical child to an existing destination parent by inserting a concatenated segment with the INSERT command, the existing destination parent's nonkey data is overlaid by the zeroes/blanks from File-AID <i>for IMS's</i> initialized I/O area. File-AID <i>for IMS</i> issues a warning message before this happens. To avoid this problem, use the REPEAT command with the concatenated segment.

When deleting a segment that is part of a logical relationship, the delete rule validation process described in the *IMS/ESA Administration Guide: DB* takes place. File-AID *for IMS* does not place any additional restrictions on the deletion of logically related segments.

When you make changes to an existing database segment that is part of a logical relationship, File-AID *for IMS* issues a DL/I REPL call to update the database. The replace

rule validation process described in the *IMS/ESA Administration Guide: DB* takes place. *File-AID for IMS* does not place any additional restrictions on the replacement of logically related segments.

Key-Only Segments

When defining a logical DBD, the SOURCE= keyword on the SEGM statement specifies whether an application program has KEY or DATA sensitivity to each segment type. When a database is edited through a logical DBD, the following *File-AID for IMS* restrictions apply to key-only segments:

- If the logical DBD used contains any nonconcatenated segments that are key-only or any concatenated segments where both the logical child and the destination parent are key-only, *File-AID for IMS* prevents you from entering the Edit function. This process avoids problems that might occur with the REPEAT ALL command and when establishing position in a database.
- If either the logical child or the destination parent portions of a concatenated segment are key-only, the INSERT and REPEAT commands are not allowed with the concatenated segment. Because *File-AID for IMS* does not have DATA sensitivity to both portions of the concatenated segment, a successful DL/I ISRT call cannot be made.
- When the logical DBD used defines a logical relationship from the physical parent's viewpoint and either the logical child or destination parent portions of the concatenated segment are key-only, the REPEAT ALL command cannot be used on any segment in the hierarchical path above the concatenated segment. As in the previous restriction, a successful DL/I ISRT call cannot be made without DATA sensitivity to both portions of the concatenated segment.

When browsing a database using a logical DBD that has a key-only segment, one of the following situations can be encountered:

- When positioned on a key-only segment while in Formatted or Unformatted mode, the informational message "KEY-ONLY SPECIFIED" and a blank screen body are displayed.
- When positioned on a key-only segment while in Unformatted mode, the segment length is zero, and the literal ** KEY-ONLY ** is displayed next to the length.
- When you use the NEXT primary command in Formatted or Unformatted mode to navigate in a hierarchically sequential manner through a database (using the NEXT command without a segment-name operand), IMS skips over key-only segment occurrences and retrieves the next data-sensitive segment occurrence.
- When you switch to Index mode from Formatted or Unformatted mode while positioned on a key-only segment, the first segment line on the Index screen contains a literal KEY-ONLY - NO DATA. When another segment occurrence becomes the current segment (for example, the key-only segment is no longer the first segment line), the KEY-ONLY - NO DATA segment line no longer appears on the screen.
- When in Index mode, the screen is filled with a hierarchically sequential listing of the segments following the current segment in a database. Because IMS skips over key-only segments when processing an unqualified GN DL/I call, key-only segments do not appear on the Index screen (except as described in the previous situation).

REPEAT Command

When editing a database that contains a logical relationship, you can use the REPEAT command to create single occurrences of any of the defined segment types. When you want to repeat substructures within a logically related database by adding the ALL operand to the REPEAT command, the following *File-AID for IMS* restrictions exist depending upon the DBD used:

- When editing through a physical DBD that defines the logical relationship from the logical parent's viewpoint and the substructure you are repeating contains the logical parent segment, the logical child segment under the logical parent is not repeated. If a logical DBD defines the logical relationship from the logical parent's viewpoint and the substructure you are repeating contains the concatenated segment, neither the concatenated segment nor any of its dependents are repeated.
- When editing through a physical DBD that defines a logical relationship from the physical parent's viewpoint, most substructures can be repeated. If a logical DBD defines the logical relationship from the physical parent's viewpoint and the substructure you are repeating contains the concatenated segment, the concatenated segment and its physical dependents are repeated. Logical dependents to the concatenated segment are not repeated.
- When editing through a physical or logical DBD as described in the previous paragraph, an additional restriction exists. When editing from the physical parent's viewpoint and the logical child segment defined under the logical parent has a unique key, REPEAT ALL is not allowed on the physical parent or any segment above it in the current hierarchical path.

Target Segment

When the target of an INSERT or REPEAT command is a logical child or concatenated segment, up to three key values must be specified on the Key Specification screen for the target segment:

- You must specify the Destination Parent Concatenated Key (DPCK) of the logical parent to which the logical child you are creating must be connected.
- You must specify the key value for the logical child or concatenated segment you are creating.
- When you work with a bidirectional virtually paired or a bidirectional physically paired logical relationship, a logical child segment is created through either the physical path (from the physical parent's viewpoint) or the logical path (from the logical parent's viewpoint). Because a logical child segment type is defined in each path, each has its own defined key field. The relative starting position and length of the key in one path may or may not match the relative starting position and length of the key in the other path. When you create a logical child segment where the two key definitions do not match, File-AID *for IMS* provides a key value entry field where you must specify the alternate path logical child key. When the alternate path logical child key is defined within the Destination Parent Concatenated Key of the segment being created, File-AID *for IMS* does not provide a separate key value entry field.

Secondary Indexes

A secondary index is used to provide an alternate entry point into a database. When a database that has a secondary index associated with it is edited, IMS automatically maintains the secondary index based on the changes made. You can edit a database that has a secondary index with File-AID *for IMS*. However, if File-AID *for IMS* cannot confirm that the secondary index's key is guaranteed to be unique, you cannot perform a REPEAT ALL command on any parent of a segment that is the source for a secondary index.

File-AID *for IMS* supports shared secondary indexes in the same way as non-shared secondary indexes.

You can use File-AID *for IMS* to browse, but not edit, the secondary index dataset as a separate database.

Sparse indexing is a feature of secondary indexing that, depending on your specifications, suppresses IMS' automatic secondary index maintenance. File-AID *for IMS* does not restrict your use of sparse indexing in any way.

Nonkeyed and Nonunique Segments

When a segment type is defined in a DBD without a sequence or key field, the segment is considered nonkeyed by File-AID for IMS. When a segment type is defined as having a key field with duplicate key values allowed in occurrences of the segment, it is considered nonunique by File-AID for IMS. There are several File-AID for IMS and IMS restrictions that affect databases that contain nonkeyed and/or nonunique segments:

- When your current segment position in the database being edited is on a nonkeyed or nonunique segment or on a subordinate of a nonkeyed or nonunique segment:
 - You must not enter the ALL operand with the REPEAT command.
 - You must not enter the CHILD command.
 - You must not enter the TWIN command.
- You must not enter the PARENT command when the parent you want to retrieve is nonkeyed or nonunique.
- When you use the INSERT or REPEAT command to create a key unique segment, the newly created segment becomes the current segment. When you create a nonkeyed or nonunique segment, your current segment is bumped up to the first parent with a unique concatenated key.
- When your current segment position is a parent of a nonkeyed or nonunique segment, a REPEAT ALL command creates the key unique segment and those children not on or under the nonkeyed or nonunique segment.
- You must not enter a NEXT command for a segment name with a nonunique concatenated key.
- When the database being browsed/edited has a nonunique root segment type or any nonkeyed or nonunique dependent segment types, informational messages I902, I905, or I906 can be returned as you manipulate the database.

Variable Length Segments

File-AID for IMS enables you to browse/edit variable length segments the same as fixed length segments, with the following differences:

- Formatted mode:
 - When you browse/edit a variable length segment, the first two characters of data shown are always the contents of the Segment Size field. The segment layout you use for the segment must include the Segment Size field. When in edit mode, you can change the length of the segment by typing directly over the Segment Size field. If you attempt to shorten or lengthen the segment beyond its defined minimum or maximum length, an error is returned. The long message for the error indicates the allowable minimum or maximum length.
 - When the variable length segment you are browsing/editing is a logical child or concatenated segment, the way in which the segment appears on the screen depends on what you specified for the segment in the segment/layout XREF function. If you specified that the segment layout for the logical child contains the logical child's Destination Parent Concatenated Key (DPCK), the layout should also contain two characters for the Segment Size field (immediately before the DPCK). If the layout you provided does not include the Segment Size field, the size field is associated and displayed with the first two positions of the DPCK. This process also causes the remaining data fields in the segment to be misaligned with the data-names.

Conversely, if the segment/layout XREF specified that the segment layout for the logical child or concatenated segment does not contain the logical child's DPCK, File-AID for IMS generates both the two-character size field and the DPCK.

- When the variable length segment you are browsing/editing is a concatenated segment, you can be restricted. If the logical child portion of the concatenated

segment is variable length, you cannot browse or edit the segment in this mode. This limitation applies regardless of whether the destination parent portion of the concatenated segment is fixed or variable in length. You can avoid this restriction by making the logical child portion of the segment key-only (enabling you to browse/edit the destination parent portion) or the destination parent portion of the segment key-only (enabling you to browse/edit the logical child portion).

You can browse/edit a concatenated segment with a fixed length logical child and variable length destination parent without restriction.

- Unformatted mode:
 - There are no restrictions affecting the browsing/editing of any variable length segment.
 - The segment length line displays the segment's current length, minimum allowable length, and maximum allowable length. For a concatenated segment, the current, minimum, and maximum lengths are displayed for both the logical child and the destination parent.
 - When editing a variable length segment, you can change the segment's current length by either typing over the segment length displayed on the segment length line or typing over the two-byte Segment Size field displayed as part of the segment contents. If you type over both, the value in the two-byte Segment Size field overrides the value on the segment length line. After your next keyboard interaction, the segment is expanded/contracted. When you edit a concatenated segment with a variable length logical child and destination parent, you can change their lengths independently of each other.
- Index mode:
 - You can increase the length of a variable length segment by typing data past the current end of the segment. Deleting data from the end of a segment does not decrease its length.
 - You must not increase the length of a concatenated segment, regardless of whether the logical child, destination parent, or both are variable length.
 - You must not type over the two-byte Segment Size field.

Segment Edit/Compression Facility

If you use a DBD that invokes a segment edit/compression facility routine, File-AID *for IMS* does not place any restrictions on the use of that routine.

Chapter 3.

Batch Audit Trail Processing

The File-AID *for IMS* Audit Trail feature captures all updates processed against selected user databases through the Edit function into the Audit Trail control database. Specification of the databases whose updates are to be captured is made at your installation by the person or group responsible for File-AID *for IMS*, not by the individual user. Information about the installation and activation of the Audit Trail feature is contained in the *File-AID Single Install Image Installation and Configuration Guide*.

All the update activity processed against the selected user databases, perhaps by several different users, is contained in a single Audit Trail control database. Compuware recommends that you periodically extract and delete all or a portion of this information from the Audit Trail database. This process enables Audit Trail reports on the user database update activity to be produced and also keeps the Audit Trail database size (that is, the number of segments contained therein) from growing too large.

The update activity stored on the Audit Trail database is extracted from the database by executing the Audit Trail Extract program (XIXATEXT). This information is sorted and then read by the Audit Trail Report program (XIXATRPD), which generates an Audit Trail Report.

Audit Trail Extract

To generate an Audit Trail Report of user database activity, the information must first be extracted from the Audit Trail control database. Compuware suggests that the extract be performed at regular, periodic intervals so that the Audit Trail Reports are generated on a timely basis and the size of the Audit Trail database remains manageable.

The Audit Trail Extract program (XIXATEXT) can be executed at any time. The program can be run as a batch DL/I or an IMS BMP program.

Selection Criteria

Existing selection criteria may be applied when the Audit Trail Extract program is executed. If selection criteria are not applied during the extract, all segments contained on the Audit Trail database are extracted. However, by applying selection criteria during the extract, you can extract only the subset of Audit Trail segments in which you are interested.

Existing selection criteria are created and maintained through Option 6 of File-AID *for IMS/ISPF*. Refer to Chapter 5, "File-AID for IMS/ISPF Selection Criteria" for an explanation of how to create existing selection criteria.

The Audit Trail database root segment has the following format:

Figure 3-1. Audit Trail Data Base Root Segment

01	AUDIT-TRAIL-ROOT.		
03	AT-ROOT-LENGTH	PIC S9(4)	COMP.
03	AT-ROOT-KEY.		
05	USER-DBD-NAME	PIC X(8).	
05	UPDATE-DATE-CCYYDDD	PIC S9(7)	COMP-3.
05	UPDATE-TIME-HHMMSS	PIC S9(7)	COMP-3.
05	FILLER	PIC S9(9)	COMP.
05	USER-ID	PIC X(8).	
05	USER-LTERM-ID	PIC X(8).	
05	FILLER	PIC X(1).	
03	SUB-OPTION-USED	PIC X(1).	
03	SEGMENT-NO	PIC S9(4)	COMP.
03	SEGMENT-LENGTH	PIC S9(4)	COMP.
03	MAX-CONCAT-KEY-LENGTH	PIC S9(4)	COMP.
03	SEGMENT-CONCAT-KEY-LENGTH	PIC S9(4)	COMP.
03	FULLY-CONCAT-KEY	PIC X (see below).	
03	USER-SEGMENT-NAME	PIC X(see below).	

AT-ROOT-LENGTH : The length of the variable length Audit Trail root segment including this two-byte field.

USER-DBD-NAME : The DBD name of the user database that was updated, which created this Audit Trail root segment.

UPDATE-DATE-CCYYDDD : The Julian date when the database was updated

UPDATE-TIME-HHMMSS : The time when the database was updated.

USER-ID : The user's assigned ID.

USER-LTERM-ID : The logical terminal ID of the user's terminal.

SUB-OPTION-USED : The Edit sub-option (1 - Formatted, 2 - Unformatted, 3 - Index) that the user was in when the update was made.

SEGMENT-NO : The hierarchical segment number of the user segment within its database record.

SEGMENT-LENGTH : The length of the user segment. The value in this field is the length of the User-Segment-Image field.

MAX-CONCAT-KEY-LENGTH : The length of the longest fully concatenated key that exists in the user database.

SEGMENT-CONCAT-KEY-LENGTH : The length of the fully concatenated key to the user segment. The value in this field is the length of the following Fully-Concat-Key field.

FULLY-CONCAT-KEY : The fully concatenated key to the user segment. This is a variable length field.

USER-SEGMENT-IMAGE : The image of the user segment that was inserted, repeated, deleted, or updated. This is a variable length field. If the user segment is variable length, the first two characters of this field contain the segment length value.

By using this segment layout to create formatted field selection criteria in Option 6 of File-AID for IMS/ISPF, you can then apply the selection criteria during the execution of the Audit Trail Extract. For example, assume you want to extract all update activity from the Audit Trail database that was performed by user XAS003 against database PORDR on January 10, 1996. Using the above layout in File-AID for IMS/ISPF Option 6, you would create existing selection criteria that has PORDR specified for USER-DBD-NAME, 1996010 specified for UPDATE-DATE-CCYYDDD, and XAS003 specified for USER-ID. You would then execute program XIXATEXT, which would create an extract file that contains only the audit trail activity you want. This extract file could then subsequently be sorted and processed by program XIXATRPD to generate an Audit Trail Report.

Checkpoints

The Audit Trail Extract program can be run as a batch DL/I or IMS BMP program. In either type of processing, a checkpoint call (CHKP) is issued after each user root segment in the audit trail root segment is read. The CHKP indicates to IMS that the program has reached a commit point. For BMP processing, the checkpoint also releases the resources that IMS enqueued for the program. In the event of an abend, IMS backs out the database updates to the most recent checkpoint. However, the Audit Trail Extract program does not have restart capability.

Extract JCL

The following JCL streams are copies of procedures (PROCs) supplied with File-AID *for IMS*. Each PROC contains two steps. The first step extracts the selected Audit Trail database segments and writes them to a sequential file. The second step produces the Audit Trail Extract Summary Report. Your installation may have modified these PROCs to meet installation standards.

Sample JCL members are located in the File-AID sample library, SXVJSAMP. Member name prefix XIXN indicates File-AID *for IMS/CICS*, prefix XIXO indicates File-AID *for IMS/DC*.

ATEXTBMP—IMSBATCH Procedure

Figure 3-2. ATEXTBMP—IMSBATCH JCL Procedure File-AID for IMS/DC (JCL member XIXOATXB)

```

//ATEXTBMP PROC RGN=4M
//* **** ATEXTBMP PARAMETERS ****
//      PRINT='*',          PRINT OUTPUT SYSOUT CLASS
//      DEV=SYSDA,          TEMPORARY WORK FILE DEVICE
//      DEV2=DISK,          PERMANENT FILE DEVICE
//      DSER=,              PERMANENT FILE VOLSER
//      RESLIB='XXXXXXXX.SDFSRESL',  IMS SDFSRESL
//      DBDLIB='XXXXXXXX.DBDLIB',    IMS DBD LIBRARY
//      EXTDSN='XXXXXXXX.EXTRACT',   AUDIT TRAIL EXTRACT DSNAME
//      EXDSORG=PS,              EXTRACT DATASET DSORG
//      EXLRECL=8188,            EXTRACT DATASET LRECL
//      EXBLK=8192,              EXTRACT DATASET BLKSIZE
//      MLIBDSN='XXXXXXXX.SXVJMENU', File-AID/ISPF MLIB DSNAME
//      CDSN='XXXXXXXX.SELCRIT',    File-AID/ISPF SELCRIT DSN
//      SCMBR='XXXXXXXX',          File-AID/ISPF SELCRIT MBR
//      CXVJLOAD='XXXXXXXX.CXVJLOAD', File-AID CXVJLOAD
//      SXVJLOAD='XXXXXXXX.SXVJLOAD', File-AID SXVJLOAD
//* **** DFSRRCOO PARAMETERS ****
//      MBR=XIXATEXT,           PROGRAM NAME IN SXVJLOAD
//      PSB=IXDUPLD,           PSB NAME
//      IN=,OUT=,OPT=,          IMS REGION CONTROLLER PGM
//      SPIE=,TEST=,DIRCA=,     PARAMETERS FOR MORE INFO
//      PRLD=,STIMER=,CKPTID=, ON THESE PARMS SEE THE
//      PARDLI=,CPUTIME=,NBA=,  IMS/V S SYSTEM PROGRAMMING
//      OBA=,IMSID=,AGN=       REFERENCE MANUAL
//-----
//*STEP1: BMP EXTRACT FROM File-AID for IMS/DC'S AUDIT TRAIL DATA BASE
//-----
//STEP1   EXEC PGM=DFSRRCOO,REGION=&RGN,
//          PARM=(BMP,&MBR,&PSB,&IN,&OUT,
//          &OPT&SPIE&TEST&DIRCA,&PRLD,&STIMER,&CKPTID,
//          &PARDLI,&CPUTIME,&NBA,&OBA,&IMSID,&AGN)
//STEPLIB DD DSN=&RESLIB,DISP=SHR
//          DD DSN=&CXVJLOAD,DISP=SHR
//          DD DSN=&SXVJLOAD,DISP=SHR
//          DD DSN=CEE.SCEERUN,DISP=SHR
//DFSRESLB DD DSN=&SDFSRESL,DISP=SHR
//SYSUDUMP DD SYSOUT=&PRINT,DCB=(LRECL=121,RECFM=VBA,BLKSIZE=3129),
//          SPACE=(125,(2500,100),RLSE,,ROUND)
//IXPD1   DD DSN=&DBDLIB,DISP=SHR
//IXPSC   DD DSN=&SCDSN(&SCMBR),DISP=SHR
//IXPTO   DD DSN=&EXTDSN,DISP=(NEW,CATLG),
//          UNIT=&DEV2,VOL=SER=&DSER,
//          SPACE=(&EXBLK,(10,5),RLSE),
//          DCB=(DSORG=&EXDSORG,RECFM=VB,LRECL=&EXLRECL,BLKSIZE=&EXBLK)
//IXPMLIB DD DSN=&MLIBDSN,DISP=SHR
//IXPSTATS DD DSN=&&STATS,DISP=(NEW,PASS),
//          UNIT=&DEV,SPACE=(6160,(10,5),RLSE),
//          DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
//SYSOUT  DD SYSOUT=&PRINT
//-----
//*STEP2: FORMAT File-AID for IMS/DC'S AUDIT TRAIL EXTRACT SUMMARY REPORT
//-----
//STEP2   EXEC PGM=XIXRPTDV,PARM=('/N'),COND=EVEN
//STEPLIB DD DSN=&CXVJLOAD,DISP=SHR
//          DD DSN=&SXVJLOAD,DISP=SHR
//          DD DSN=CEE.SCEERUN,DISP=SHR
//IXPSTATS DD DSN=&&STATS,DISP=(OLD,DELETE,DELETE)
//IXPD1   DD DSN=&DBDLIB,DISP=SHR
//IXPSC   DD DSN=&SCDSN(&SCMBR),DISP=SHR
//IXPMLIB DD DSN=&MLIBDSN,DISP=SHR
//SYSOUT  DD SYSOUT=&PRINT
//          PEND
//BMP     EXEC ATEXTBMP
//-----
//*      INSERT PROGRAM CONTROL CARD AFTER THE SYSIN DD STATEMENT
//-----
//STEP1.SYSIN DD      *
//

```


Figure 3-3. ATEXTBMP—IMSBATCH JCL Procedure File-AID for IMS/CICS (JCL member XIXNATXB)

```

//ATEXTBMP PROC RGN=4M
//* **** ATEXTBMP PARAMETERS ****
// PRINT='*', PRINT OUTPUT SYSOUT CLASS
// DEV=SYSDA, TEMPORARY WORK FILE DEVICE
// DEV2=DISK, PERMANENT FILE DEVICE
// DSER=, PERMANENT FILE VOLSER
// RESLIB='XXXXXXXX.SDFSRESL', IMS SDFSRESL
// DBDLIB='XXXXXXXX.DBDLIB', IMS DBD LIBRARY
// EXTDSN='XXXXXXXX.EXTRACT', AUDIT TRAIL EXTRACT DSNNAME
// EXDSORG=PS, EXTRACT DATASET DSORG
// EXLRECL=8188, EXTRACT DATASET LRECL
// EXBLK=8192, EXTRACT DATASET BLKSIZE
// MLIBDSN='XXXXXXXX.SXVJMENU', File-AID/ISPF MLIB DSNNAME
// CDSN='XXXXXXXX.SELCRIT', File-AID/ISPF SELCRIT DSN
// SCMBR='XXXXXXXX', File-AID/ISPF SELCRIT MBR
// CXVJLOAD='XXXXXXXX.CXVJLOAD', File-AID CXVJLOAD
// SXVJLOAD='XXXXXXXX.SXVJLOAD', File-AID SXVJLOAD
//* **** DFSRRCOO PARAMETERS ****
// MBR=XIXATEXT, PROGRAM NAME IN SXVJLOAD
// PSB=IXDUPLD, PSB NAME
// IN=,OUT=,OPT=, IMS REGION CONTROLLER PGM
// SPIE=,TEST=,DIRCA=, PARAMETERS FOR MORE INFO
// PRLD=,STIMER=,CKPTID=, ON THESE PARMS SEE THE
// PARDLI=,CPUTIME=,NBA=, IMS/VS SYSTEM PROGRAMMING
// OBA=,IMSID=,AGN= REFERENCE MANUAL
//*-----
//*STEP1: BMP EXTRACT FROM File-AID for IMS/DC'S AUDIT TRAIL DATA BASE
//*-----
//STEP1 EXEC PGM=DFSRRCOO,REGION=&RGN,
// PARM=(BMP,&MBR,&PSB,&IN,&OUT,
// &OPT&SPIE&TEST&DIRCA,&PRLD,&STIMER,&CKPTID,
// &PARDLI,&CPUTIME,&NBA,&OBA,&IMSID,&AGN)
//STEPLIB DD DSN=&RESLIB,DISP=SHR
// DD DSN=&CXVJLOAD,DISP=SHR
// DD DSN=&SXVJLOAD,DISP=SHR
// DD DSN=CEE.SCEERUN,DISP=SHR
//DFSRESLB DD DSN=&SDFSRESL,DISP=SHR
//SYSUDUMP DD SYSOUT=&PRINT,DCB=(LRECL=121,RECFM=VBA,BLKSIZE=3129),
// SPACE=(125,(2500,100),RLSE,,ROUND)
//IXPD1 DD DSN=&DBDLIB,DISP=SHR
//IXPSC DD DSN=&SCDSN(&SCMBR),DISP=SHR
//IXPTO DD DSN=&EXTDSN,DISP=(NEW,CATLG),
// UNIT=&DEV2,VOL=SER=&DSER,
// SPACE=(&EXBLK,(10,5),RLSE),
// DCB=(DSORG=&EXDSORG,RECFM=VB,LRECL=&EXLRECL,BLKSIZE=&EXBLK)
//IXPMLIB DD DSN=&MLIBDSN,DISP=SHR
//IXPSTATS DD DSN=&&STATS,DISP=(NEW,PASS),
// UNIT=&DEV,SPACE=(6160,(10,5),RLSE),
// DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
//SYSOUT DD SYSOUT=&PRINT
//*-----
//*STEP2: FORMAT File-AID for IMS/CICS' AUDIT TRAIL EXTRACT SUMMARY REPORT
//*-----
//STEP2 EXEC PGM=XIXRPTDV,PARM=( '/N' ),COND=EVEN
//STEPLIB DD DSN=&CXVJLOAD,DISP=SHR
// DD DSN=&SXVJLOAD,DISP=SHR
// DD DSN=CEE.SCEERUN,DISP=SHR
//IXPSTATS DD DSN=&&STATS,DISP=(OLD,DELETE,DELETE)
//IXPD1 DD DSN=&DBDLIB,DISP=SHR
//IXPSC DD DSN=&SCDSN(&SCMBR),DISP=SHR
//IXPMLIB DD DSN=&MLIBDSN,DISP=SHR
//SYSOUT DD SYSOUT=&PRINT
// PEND
//BMP EXEC ATEXTBMP
//*-----
//* INSERT PROGRAM CONTROL CARD AFTER THE SYSIN DD STATEMENT
//*-----
//STEP1.SYSIN DD *
//

```

ATEXTDLI—DLIBATCH Procedure

Figure 3-4. ATEXTDLI—DLIBATCH JCL Procedure File-AID for IMS/DC (JCL member XIXOATXD)

```

//ATEXTDLI PROC RGN=4M
//* ****ATEXTDLI PARAMETERS****
// PRINT='*', PRINT OUTPUT SYSOUT CLASS
// DEV=SYSDA, TEMPORARY WORK FILE DEVICE
// DEV2=DISK, PERMANENT FILE DEVICE
// DSER=, PERMANENT FILE VOLSER
// SDFSRESL='XXXXXXXX.SDFSRESL', IMS SDFSRESL
// DBDLIB='XXXXXXXX.DBDLIB', IMS DBD LIBRARY
// PSBLIB='XXXXXXXX.PSBLIB', IMS PSB LIBRARY
// SDFSMAC='XXXXXXXX.SDFSMA', IMS PROCEDURE LIBRARY
// DFSVSAM='DFSVSAMP', PROCLIB MEMBER CONTAINING
//* BUFFER POOL DATA
// EXTDSN='XXXXXXXX.EXTRACT', AUDIT TRAIL EXTRACT DSNAME
// EXDSORG=PS, EXTRACT DATASET DSORG
// XLRECL=8188, EXTRACT DATASET LRECL
// EXBLK=8192, EXTRACT DATASET BLKSIZE
// IXPDB='XXXXXXXX.IXDAUD', File-AID for IMS/DC AUD DATA BASE
// MLIBDSN='XXXXXXXX.SXVJMENU', File-AID MLIB DSNAME
// SCDSN='XXXXXXXX.SELCRIT', File-AID/ISPF SEL DSN
// SCMBR='XXXXXXXX', File-AID/ISPF SELCRIT MBR
// CXVJLOAD='XXXXXXXX.CXVJLOAD', File-AID CXVJLOAD
// SXVJLOAD='XXXXXXXX.SXVJLOAD', File-AID SXVJLOAD
//* ****DFSRRCOO PARAMETERS****
// MBR=XIXATEXT, PROGRAM NAME IN SXVJLOAD
// PSB=IXDUPLD, PSB NAME
// BUF=,SPIE=,TEST=, IMS REGION CONTROLLER PGM
// EXCPVR=,RST=,PRLD=, PARAMETERS FOR MORE INFO
// SRCH=,CKPTID=,MON=, ON THESE PARMS SEE THE
// LOGA=,FMTO=,IMSID=, IMS/V S SYSTEM PROGRAMMING
// SWAP=,DBRC=,IRLM=, REFERENCE MANUAL
// IRLMNM=

```

Figure 3-5. ATEXTDLI—DLIBATCH JCL Procedure File-AID/DC (Cont.)

```

-----
/*
/* STEP1: DLI EXTRACT FROM File-AID/DC'S AUDIT TRAIL DATA BASE
/*-----
//STEP1      EXEC PGM=DFSRRCOO,REGION=&RGN,
//           PARM=(DLI,&MBR,&PSB,&BUF,
//           &SPIE&TEST&EXCPVR&RST,&PRLD,
//           &SRCH,&CKPTID,&MON,&LOGA,&FMTO,
//           &IMSID,&SWAP,&DBRC,&IRLM,&IRLMNM)
//STEPLIB   DD DSN=&RESLIB,DISP=SHR
//           DD DSN=&CXVJLOAD,DISP=SHR
//           DD DSN=&SXVJLOAD,DISP=SHR
//           DD DSN=CEE.SCEERUN,DISP=SHR
//DFSRESLB  DD DSN=&RESLIB,DISP=SHR
//IMS       DD DSN=&DBDLIB,DISP=SHR
//           DD DSN=&PSBLIB,DISP=SHR
//DFSVSAMP  DD DSN=&PROCLIB(&DFSVSAM),DISP=SHR
//SYSUDUMP  DD SYSOUT=&PRINT,DCB=(LRECL=121,RECFM=VBA,BLKSIZE=3129),
//           SPACE=(125,(2500,100),RLSE,,ROUND)
//IEFRDER   DD DUMMY,DCB=BLKSIZE=100
//IXDAUDD   DD DSN=&IXPDB,DISP=OLD
/*-----
/*IF USING DYNAMIC ALLOCATION UNCOMMENT THE FOLLOWING DD CARD
/*-----
/*IXPIMSDY  DD DUMMY
//IXPD1     DD DSN=&DBDLIB,DISP=SHR
//IXPSC     DD DSN=&SCDSN(&SCMBR),DISP=SHR
//IXPTO     DD DSN=&EXTDSN,DISP=(NEW,CATLG),
//           UNIT=&DEV2,VOL=SER=&DSER,SPACE=(&EXBLK,(10,5),RLSE),
//           DCB=(DSORG=&EXDSORG,RECFM=VB,LRECL=&EXLRECL,BLKSIZE=&EXBLK)
//IXPMLIB   DD DSN=&MLIBDSN,DISP=SHR
//IXPSTATS  DD DSN=&&STATS,DISP=(NEW,PASS),
//           UNIT=&DEV,SPACE=(6160,(10,5),RLSE),
//           DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
//SYSOUT    DD SYSOUT=&PRINT
/*-----
/* STEP2: FORMAT File-AID for IMS/DC'S AUDIT TRAIL EXTRACT SUMMARY REPORT
/*-----
//STEP2      EXEC PGM=XIXRPTDV,PARM=('/'N'),COND=EVEN
/*
//STEPLIB   DD DSN=&CXVJLOAD,DISP=SHR
//           DD DSN=&SXVJLOAD,DISP=SHR
//           DD DSN=CEE.SCEERUN,DISP=SHR
//IXPSTATS  DD DSN=&&STATS,DISP=(OLD,DELETE,DELETE)
//IXPD1     DD DSN=&DBDLIB,DISP=SHR
//IXPSC     DD DSN=&SCDSN(&SCMBR),DISP=SHR
//IXPMLIB   DD DSN=&MLIBDSN,DISP=SHR //SYSOUT    DD SYSOUT=&PRINT
//SYSOUT    DD SYSOUT=&PRINT
/*
//           PEND
/*
//DLI       EXEC ATEXTDLI
/*-----
/*INSERT PROGRAM CONTROL CARD AFTER THE SYSIN DD STATEMENT
/*-----
//STEP1.SYSIN DD *
//

```

Figure 3-6. ATEXTDLI—DLIBATCH JCL Procedure File-AID/CICS (JCL member XIXNATXD)

```

//ATEXTDLI PROC RGN=4M
//* ****ATEXTDLI PARAMETERS****
// PRINT='*', PRINT OUTPUT SYSOUT CLASS
// DEV=SYSDA, TEMPORARY WORK FILE DEVICE
// DEV2=DISK, PERMANENT FILE DEVICE
// DSER=, PERMANENT FILE VOLSER
// RESLIB='XXXXXXXX.SDFSRESL', IMS SDFSRESL
// DBDLIB='XXXXXXXX.DBDLIB', IMS DBD LIBRARY
// PSBLIB='XXXXXXXX.PSBLIB', IMS PSB LIBRARY
// PROCLIB='XXXXXXXX.SDFSMACT', IMS PROCEDURE LIBRARY
// DFSVSAM='DFSVSAMP', PROCLIB MEMBER CONTAINING
//* BUFFER POOL DATA
// EXTDSN='XXXXXXXX.EXTRACT', AUDIT TRAIL EXTRACT DSNAME
// EXDSORG=PS, EXTRACT DATASET DSORG
// EXLRECL=8188, EXTRACT DATASET LRECL
// EXBLK=8192, EXTRACT DATASET BLKSIZE
// IXPDB='XXXXXXXX.IXCAUD', File-AID/CICS AUD DATA BASE
// MLIBDSN='XXXXXXXX.SXVJMENU', File-AID MLIB
// SCDSN='XXXXXXXX.SELCRIT', File-AID for IMS/ISPF SC DSN
// SCMBR='XXXXXXXX', File-AID for IMS/ISPF SELCRIT MBR
// CXVJLOAD='XXXXXXXX.CXVJLOAD', File-AID CXVJLOAD
// SXVJLOAD='XXXXXXXX.SXVJLOAD', File-AID SXVJLOAD
//* ****DFSRRCOO PARAMETERS****
// MBR=XIXATEXT, PROGRAM NAME IN SXVJLOAD
// PSB=IXCUPLD, PSB NAME
// BUF=, SPIE=, TEST=, IMS REGION CONTROLLER PGM
// EXCPVR=, RST=, PRLD=, PARAMETERS FOR MORE INFO
// SRCH=, CKPTID=, MON=, ON THESE PARMS SEE THE
// LOGA=, FMTO=, IMSID=, IMS/VIS SYSTEM PROGRAMMING
// SWAP=, DBRC=, IRLM=, REFERENCE MANUAL
// IRLMNM=

```

Figure 3-7. ATEXTDLI—DLIBATCH JCL Procedure File-AID/CICS (Cont.)

```

-----
/*
/* STEP1: DLI EXTRACT FROM File-AID for IMS/CICS' AUDIT TRAIL DATA BASE
/*-----
//STEP1      EXEC PGM=DFSRRCOO,REGION=&RGN,
//           PARM=(DLI,&MBR,&PSB,&BUF,
//           &SPIE&TEST&EXCPVR&RST,&PRLD,
//           &SRCH,&CKPTID,&MON,&LOGA,&FMTO,
//           &IMSID,&SWAP,&DBRC,&IRLM,&IRLMNM)
//STEPLIB   DD DSN=&RESLIB,DISP=SHR
//           DD DSN=&CXVJLOAD,DISP=SHR
//           DD DSN=&SXVJLOAD,DISP=SHR
//           DD DSN=CEE.SCEERUN,DISP=SHR
//DFSRESLB  DD DSN=&RESLIB,DISP=SHR
//IMS       DD DSN=&DBDLIB,DISP=SHR
//           DD DSN=&PSBLIB,DISP=SHR
//DFSVSAMP  DD DSN=&PROCLIB(&DFSVSAM),DISP=SHR
//SYSABEND  DD SYSOUT=&PRINT,DCB=(LRECL=121,RECFM=VBA,BLKSIZE=3129),
//           SPACE=(125,(2500,100),RLSE,,ROUND)
//ABNLDUMP  DD DUMMY
//IEFRDER   DD DUMMY,DCB=BLKSIZE=100
//IXCAUDDD  DD DSN=&IXPDB,DISP=OLD
/*-----
/*IF USING DYNAMIC ALLOCATION UNCOMMENT THE FOLLOWING DD CARD
/*-----
/*IXPIMSDY  DD DUMMY
//IXPD1     DD DSN=&DBDLIB,DISP=SHR
//IXPSC     DD DSN=&SCDSN(&SCMBR),DISP=SHR
//IXPTO     DD DSN=&EXTDSN,DISP=(NEW,CATLG,DELETE),
//           UNIT=&DEV2,VOL=SER=&DSER,SPACE=(&EXBLK,(10,5),RLSE),
//           DCB=(DSORG=&EXDSORG,RECFM=VB,LRECL=&EXLRECL,BLKSIZE=&EXBLK)
//IXPMLIB   DD DSN=&MLIBDSN,DISP=SHR
//IXPSTATS  DD DSN=&&STATS,DISP=(NEW,PASS),
//           UNIT=&DEV,SPACE=(6160,(10,5),RLSE),
//           DCB=(DSORG=PS,RECFM=FB,LRECL=80,BLKSIZE=6160)
//SYSOUT    DD SYSOUT=&PRINT
/*-----
/* STEP2: FORMAT File-AID for IMS/DC'S AUDIT TRAIL EXTRACT SUMMARY REPORT
/*-----
//STEP2     EXEC PGM=XIXRPTDV,PARM=( '/N' ),COND=EVEN
//STEPLIB   DD DSN=&CXVJLOAD,DISP=SHR
//           DD DSN=&SXVJLOAD,DISP=SHR
//           DD DSN=CEE.SCEERUN,DISP=SHR
//IXPSTATS  DD DSN=&&STATS,DISP=(OLD,DELETE,DELETE)
//IXPD1     DD DSN=&DBDLIB,DISP=SHR
//IXPSC     DD DSN=&SCDSN(&SCMBR),DISP=SHR
//IXPD1     DD DSN=&DBDLIB,DISP=SHR
//IXPMLIB   DD DSN=&MLIBDSN,DISP=SHR //SYSOUT    DD SYSOUT=&PRINT
//SYSOUT    DD SYSOUT=&PRINT
//SYSABEND  DD SYSOUT=&PRINT
//ABNLDUMP  DD DUMMY
/*
//          PEND
/*
//DLI       EXEC ATEXTDLI
/*-----
/*INSERT PROGRAM CONTROL CARD AFTER THE SYSIN DD STATEMENT
/*-----
//STEP1.SYSIN DD  *
//

```

Extract DD Statements

The following DD statements define the primary processing files required to run the Audit Trail Extract program.

Table 3-1. Audit Trail Extract Program DD Statements

DD Statement	Description
STEPLIB	Designates the IMS system dataset that contains the IMS nucleus, required action modules (&RESLIB), and the library where File-AID load modules are stored (&CXVJLOAD and &SXVJLOAD).
DFSRESLB	Designates the IMS system dataset that contains the IMS nucleus and required action modules (&RESLIB). In ATEXTDLI and ATEXTBMP PROCs only.

Table 3-1. Audit Trail Extract Program DD Statements

DD Statement	Description
IMS	Designates the IMS system datasets that contain the database description blocks (&DBDLIB) and the program specification blocks (&PSBLIB). In ATEXTDLI PROC only.
DFSVSAMP	Designates the dataset (&PROCLIB) and member (&DFSVSAM) that contain the control statements that describe the size and structure of the VSAM shared resource pool for File-AID for IMS' Audit Trail control database. The buffers must be large enough to accept the largest segment size in the Audit Trail control database. In ATEXTDLI PROC only.
SYSUDUMP SYSABEND	Produces a dump of user areas. The dump is formatted so that it can be printed directly.
IEFRDER	Designates the log dataset when update intent is declared. In ATEXTDLI PROC only.
IXDAUDDD IXCAUDDD	Designates File-AID for IMS' Audit Trail control database (&IXPDB) that is extracted. In ATEXTDLI PROC only.
IXPD1	Designates the DBD load library that contains the DBD load module that defines the Audit Trail database specified on the program control card.
IXPSC	The optional existing selection criteria dataset (and member, if required). If a full database extract is being performed (that is, no selection criteria is to be applied), then this DD statement can remain coded in the procedure, but the Selection Criteria Indicator field on the program control card read by XIXATEXT must be set to N (for more information refer to "Program Control Card" on page 3-12).
IXPTO	The Audit Trail output extract dataset (and member, if required). This file can be sequential, a member of a PDS, or a VSAM-ESDS. The example PROCs show this file as a variable blocked sequential dataset. To determine the correct BLKSIZE and LRECL to use, refer to the AUD Database table at the end of the DBD Tailoring topic in the <i>File-AID Single Install Image Installation and Configuration Guide</i> . If the CI/BLOCK SIZE your installation is using for the Audit Trail control database is 8192, then use a BLKSIZE of 8192 and an LRECL of 8188 for the IXPTO file. If a larger Audit Trail database CI/BLOCK SIZE is being used, then calculate the IXPTO file's BLKSIZE and LRCCL accordingly.
IXPMLIB	Designates the library that contains File-AID for IMS/ISPF messages.
IXPSTATS	The temporary dataset used as input to the next step (executing XIXRPTDV), which creates the Audit Trail Extract Summary Report.
SYSOUT	Designates the output class for possible error messages.
SYSIN	The program control card follows this DD statement. For more information refer to "Program Control Card" on page 3-12.

The following DD statements are required for the execution of XIXRPTDV:

Table 3-2. XIXRPTDV Audit Trail Extract Program DD Statements

DD Statement	Description
STEPLIB	The dataset where the File-AID load modules reside.
IXPSTATS	The temporary dataset passed from the preceding extract step that contains statistics used for reporting purposes.
IXPSC	The same selection criteria dataset (and member, if required) as specified for this DD in the preceding extract step.
IXPMLIB	The library containing File-AID for IMS/ISPF messages.
SYSOUT	The output class for the Audit Trail Extract Summary Report.

Parameters

The parameters on the PROC statement assign default values to symbolic parameters on the procedure statement. To override a default parameter value on the PROC statement, code the same parameter on the EXEC statement that calls the procedure.

The ATEXTDLI and ATEXTBMP parameters specify the sysout class, load libraries, and dataset names used when the program executes. These entries are described in “Extract DD Statements” on page 3-9.

The DFSRC00 parameters are the IMS execution time parameters. For more information on these parameters, refer to IBM's *IMS System Programming Reference Manual*.

The parameter information in the PARM field on the EXEC statement for the second step (executing XIXRPTDV) must have the following format:

<u>Description</u>	<u>Value</u>	<u>Start Posn</u>	<u>End Posn</u>
Constant	"/N"	1	2

Program Control Card

A program control card is used to specify the type of processing you want the Audit Trail Extract to perform. The card is entered after the SYSIN DD statement shown in the earlier JCL streams and is read by program XIXATEXT.

Following is the format of the processing options specified on the program control card:

Table 3-3. Program Card Processing Options

Field	Start Posn	End Posn	Description
Audit Trail Data Base DBD Name	1	8	The DBD name used by your installation for the Audit Trail database. This DBD name is also specified with parameter ATTRLDBD in installation job DCP#02 (refer to Chapter 9, "File-AID for IMS/CICS Product Configuration" or Chapter 10, "File-AID for IMS/DC Product Configuration" in the <i>File-AID Single Install Image Installation and Configuration Guide</i>).
Selection Criteria Indicator	9	9	E Apply existing selection criteria (refer to IXPSC in "Extract DD Statements" on page 3-9) during Audit Trail Extract. N Do not apply selection criteria.
Extract Mode	10	10	E Extract only the Audit Trail segments that pass selection criteria (all segments if Selection Criteria Indicator is N). Do not delete segments after extraction. D Delete only the Audit Trail segments that pass selection criteria (all segments if Selection Criteria Indicator is N). Do not extract segments before deletion. B Extract and delete only Audit Trail segments that pass selection criteria (all segments if Selection Criteria Indicator is N).
Job Type	11	15	BMP ATEXTEMP procedure is being executed. BATCH ATEXTDLI procedure is being executed.

If your intent is to extract and delete all segments from the Audit Trail database (that is, no selection criteria are applied) when performing the Audit Trail Extract process, do one of the following:

- Specify N for the Selection Criteria Indicator and B for the Extract Mode on the program control card.
- Specify N for the Selection Criteria Indicator and E for the Extract Mode to only extract (not also delete) the database segments. This method, which normally requires less processing time, enables you to delete, redefine, and reinitialize the entire Audit Trail database in subsequent job steps that you create.

Similarly, if your intent is only to delete all Audit Trail database segments (without also extracting them), you can specify N for the Selection Criteria Indicator and D for the Extract Mode. However, it is significantly quicker to execute your own delete, redefine,

and reinitialize steps. Executing the Audit Trail Extract in the delete only extract mode is normally only done when you want to also apply selection criteria during the process, thereby deleting only a selected subset of the database's segments.

Sample JCL to delete and redefine the Audit Trail control database is provided with File-AID *for IMS* in Sample dataset SXVJSAMP, JCL members XIXNDDFO or XIXODDFO (for an OSAM database) and XIXNDDFV or XIXODDFV (for a VSAM database). Sample JCL to reinitialize the Audit Trail database is provided in the Sample dataset SXVJSAMP, member XIXNAUDI or XIXOAUDI.

Note: Before you can execute your own delete, redefine, and reinitialize steps, the Audit Trail database must be offline.

The following example shows the correct coding of the XIXATEXT program control card for the ATEXTDLI procedure when the Audit Trail database DBD name is ATDBD and the segments that pass selection criteria are to be extracted and deleted.

```
//SYSIN      DD      *
ATDBD       EBBATCH
```

Extract Return Codes

An Audit Trail Extract return code (RC) appears in the output listing. For return code 16, an error message that indicates the specific problem also appears in the listing. In general, the return codes can be summarized as follows:

<u>RC</u>	<u>Explanation</u>	<u>Error Description</u>
0	job ran to completion	none
16	job aborted, severe error	input or system error

Extract Report

After the Audit Trail Extract job executes, an Audit Trail Data Base to File Extract Report is printed. It consists of four parts as shown in Figure 3-12 on page 3-24 through Figure 3-15 on page 3-25.

1. Audit Trail Data Base Dataset Summary.
2. Audit Trail Data Base Summary.
3. A listing of selection criteria applied if any.
4. Information showing the number of segments selected by each set of field selection criteria if any.

The first part of the report is the Audit Trail Data Base Dataset Summary. The top section shows the "FROM" Audit Trail database DBD library dataset name, the DBD member name, the extract job type, and the extract mode. The middle section shows the database with its associated DD name and dataset name. The bottom section shows the "TO" extract file dataset name and member name (if it is a PDS).

Note: When running as a BMP or shared database job, the Audit Trail database dataset name can be determined only if your installation uses the dynamic database allocation feature of IMS. If File-AID *for IMS* cannot determine the dataset name, "UNABLE TO DETERMINE" is shown in the Dataset Name field on the report.

The Audit Trail Data Base Summary shown in Figure 3-13 on page 3-24 displays a count of the segments read, segments rejected by selection criteria, and segments extracted, deleted, or extracted and deleted (depending on the extract mode specified on the program control card). The counts are shown by segment name, with the level and

segment hierarchy shown to the left of the segment name. Column totals are shown at the bottom of the page.

A note line is displayed after the segment totals. The line indicates, based upon the keys specified in selection criteria, if sequential or direct access to the root segments is used. For further information, refer to “Direct Access Processing” on page 5-26.

The Selection Criteria Summary shown in Figure 3-15 on page 3-25 lists the segment and field selection criteria applied. The starting position in the segment, length, relational operator, value, and logical operator (AND or OR) used in the comparison are shown for each field selected, in each set of unformatted field selection criteria. The data-name, starting position in the segment, length, format, relational operator, and value used in the comparison are shown for each field selected, in each set of formatted field selection criteria.

Figure 3-15 on page 3-25 details the number of segments selected by each set of field selection criteria. First, Unformatted field selection criteria, followed by Formatted field selection criteria, are applied in sequence to each segment in the Audit Trail database. If a particular segment satisfies multiple sets of field selection criteria, it is tallied only under the first set satisfied. If the selection criteria do not contain any field selection criteria, this part of the report is omitted.

Sorting the Audit Trail Extract File

The Audit Trail Extract file created by the execution of the XIXATEXT Audit Trail Extract program should be sorted before it is processed by the XIXATRPD Audit Trail Report program. The extracted segment images will not appear in a meaningful order in an unsorted extract file because the Audit Trail control database is an HDAM database. An Audit Trail Extract record is formatted as follows:

Figure 3-8. Audit Trail Extract Record

```

01  AUDIT-TRAIL-EXTRACT-RECORD.
    03  USER-DBD-NAME                PIC X(8).
    03  UPDATE-DATE-TIME-SEQ.
        05  UPDATE-DATE-CCYYDDD      PIC S9(7)   COMP-3.
        05  UPDATE-TIME-HHMMSS       PIC S9(7)   COMP-3.
        05  UPDATE-SEQ-INFO          PIC X(9).
    03  USER-ID                     PIC X(8).
    03  USER-LTERM-ID               PIC X(8).
    03  SUB-OPTION-USED              PIC X(1).
    03  SEGMENT-NO                   PIC S9(4)   COMP.
    03  SEGMENT-LENGTH               PIC S9(4)   COMP.
    03  FULLY-CONCAT-KEY             PIC X(see below).
    03  USER-SEGMENT-NAME           PIC X(see below).

```

USER-DBD-NAME : The DBD name of the user database that was updated, which created the segment image.

UPDATE-DATE-YYDDD : The Julian date when the database was updated (see note following).

UPDATE-TIME-HHMMSS : The time when the database was updated (see note following).

UPDATE-SEQ-INFO : Contains File-AID *for IMS* internal control information necessary to ensure that the extract file records are sorted in the correct order (see the note following).

USER-ID : The user’s assigned ID.

USER-LTERM-ID : The logical terminal ID of the user’s terminal.

SUB-OPTION-USED : The Edit sub-option (1 - Formatted, 2 - Unformatted, 3 - Index) that the user was in when the update was made.

SEGMENT-NO : The hierarchical segment number of the user segment within its database record.

SEGMENT-LENGTH : The length of the user segment. The value in this field is the length of the User-Segment-Image field.

FULLY-CONCAT-FIELD : The fully concatenated key to the user segment, padded with spaces to the right if necessary. The length of this fixed length field is equal to the length of the longest fully concatenated key contained in this user database.

USER-SEGMENT-IMAGE : The image of the user segment that was inserted, repeated, deleted, or updated (this is a variable length field). If the user segment is variable length, the first two characters of this field contain the segment length value.

Important

The majority of the time you will likely want to sort the Audit Trail Extract file into an ascending sequence based on a combination of the User-DBD-Name, Update-Date-Time-Seq, and User-ID fields. While you can sort the extract file into any order that you want to make the Audit Trail Report (produced from the sorted extract file) meaningful, it is strongly recommended that you always include the 17-byte Update-Date-Time-Seq field somewhere in the specification of your sort sequence. It is also recommended that you always treat the 17 characters described by Update-Date-Time-Seq as a contiguous field. Breaking those 17 characters apart in the sort could result in a very hard to read Audit Trail Report.

You can use any sorting program or utility to sort the Audit Trail Extract file. In the example below, IBM's DFSORT program is used to sort an extract file into ascending sequence by DBD name and user-id, in the chronological order that the user database updates were made.

```
//SORT EXEC PGM=SORT
//STEPLIB DD DSN=SYS1.SORTLIB,
// DISP=SHR
//SYSOUT DD SYSOUT=A
//SORTIN DD DSN=audit-trail-extract-file,
// DISP=OLD
//SORTOUT DD DSN=sorted-extract-file,
// DISP=(,PASS),
// UNIT=temporary-device,
// SPACE=(BLKSIZE,(10,3),RLSE),
// DCB=(RECFM=VB,LRECL=1recl,BLKSIZE=blksize)
//SORTWK01 DD UNIT=SYSDA,
// SPACE=(CYL,(10))
//SORTWK02 DD UNIT=SYSDA,
// SPACE=(CYL,(10))
//SORTWK03 DD UNIT=SYSDA,
// SPACE=(CYL,(10))
//SYSIN DD *
RECORD TYPE=V
SORT FIELDS=(5,8,CH,A,30,8,CH,A,13,17,CH,A)
```

Refer to the description of the IXPTO DD statement in “Extract DD Statements” on page 3-9 for information on what to specify for the LRECL and BLKSIZE for the SORTOUT file.

Also note that for a variable blocked sequential or PDS SORTIN file, the record descriptor word (RDW) must be allowed for in the specification of the starting positions for the sort fields.

Audit Trail Report

The last step in producing an Audit Trail Report is the actual execution of program XIXATRPD. One or many sorted Audit Trail Extract files can be processed by one execution of XIXATRPD. This program can be run as a batch DL/I or an IMS BMP program.

Audit Trail Report JCL

The following JCL streams are copies of procedures (PROCs) supplied with File-AID for IMS. Each PROC contains one step which produces an Audit Trail Report from the sorted Audit Trail Extract files supplied as input. Your installation may have modified these PROCs to meet installation standards.

ATRPDBMP—IMSBATCH Procedure

Figure 3-9. ATRPDBMP—IMSBATCH JCL Procedure (JCL member XIXOATPB)

```

//*      ****ATRPDBMP PARAMETERS****
//      PRINT='*',                PRINT OUTPUT SYSOUT CLASS
//      SDFSRES='XXXXXXXX.SDFSRESL',  IMS SDFSRESL
//      SEXTDSN='XXXXXXXX.SORT.EXT',  AUD TRAIL SORTED EXTRACT
//      MLIBDSN='XXXXXXXX.SXVJMENU',  File-AID for MLIB
//      CXVJLOAD='XXXXXXXX.CXVJLOAD',  File-AID CXVJLOAD
//      SXVJLOAD='XXXXXXXX.SXVJLOAD',  File-AID SXVJLOAD
//*      ****DFSRRCOO PARAMETERS****
//      MBR=XIXATRPD,              PROGRAM NAME IN SXVJLOAD
//      PSB=IXDUPLD,              PSB NAME
//      IN=,OUT=,OPT=,            IMS REGION CONTROLLER PGM
//      SPIE=,TEST=,DIRCA=,      PARAMETERS FOR MORE INFO
//      PRLD=,STIMER=,CKPTID=,   ON THESE PARMS SEE THE
//      PARDLI=,CPUTIME=,NBA=,   IMS/VS SYSTEM PROGRAMMING
//      OBA=,IMSID=,AGN=        REFERENCE MANUAL
//
//-----
//*      STEP1: BMP TO CREATE File-AID/DC'S AUDIT TRAIL REPORT
//-----
//STEP1  EXEC PGM=DFSRRCOO,REGION=&RGN,
//        TPARM=(BMP,&MBR,&PSB,&IN,&OUT,
//              &OPT&SPIE&TEST&DIRCA,&PRLD,&STIMER,&CKPTID,
//              &PARDLI,&CPUTIME,&NBA,&OBA,&IMSID,&AGN)
//STEPLIB DD DSN=&SDFSRESL,DISP=SHR
//        DD DSN=&CXVJLOAD,DISP=SHR
//        DD DSN=&SXVJLOAD,DISP=SHR
//        DD DSN=CEE.SCEERUN,DISP=SHR
//DFSRESLB DD DSN=&RESLIB,DISP=SHR
//SYSABEND DD SYSOUT=&PRINT,DCB=(LRECL=121,RECFM=VBA,BLKSIZE=3129),
//          SPACE=(125,(2500,100),RLSE,,ROUND)
//ABNLDUMP DD DUMMY
//IXPAT DD DSN=&SEXTDSN,DISP=SHR
//IXPMLIB DD DSN=&MLIBDSN,DISP=SHR
//SYSOUT DD SYSOUT=&PRINT
//
//      PEND
//
//BMP    EXEC ATRPDBMP
//
//-----
//*      INSERT PROGRAM CONTROL CARDS AFTER THE SYSIN DD STATEMENT.
//
//SYSIN  DD      *
//

```

ATRPDDLI—DLIBATCH Procedure

Figure 3-10. ATRPDDLI—DLIBATCH Procedure File-AID/DC (JCL member XIXOATPD)

```

//ATRPDDLI PROC RGN=4M
//*
//*      ***ATRPDDLI PARAMETERS***
//      PRINT='*',          PRINT OUTPUT SYSOUT CLASS
//      SDFSRESL='XXXXXXX.SDFSRESL',  IMS SDFSRESL
//      DBDLIB='XXXXXXX.DBDLIB',      IMS DBD LIBRARY
//      PSBLIB='XXXXXXX.PSBLIB',      IMS PSB LIBRARY
//      SDFSMAC='XXXXXXX.SDFSMAC',    IMS PROCEDURE LIBRARY
//      DFSVSAM='DFSVSAMP',          SDFSAC MEMBER CONTAINING
//                                  BUFFER POOL DATA
//      SEXTDSN='XXXXXXX.SORT.EXT',    AUD TRAIL SORTED EXTRACT
//      IXPDB='XXXXXXX.IXDCLT',        File-AID/DC CLT DATA BASE
//      MLIBDSN='XXXXXXX.SXVJMENU',    File-AID MLIB
//      CXVJLOAD='XXXXXXX.CXVJLOAD',   File-AID CXVJLOAD
//      SXVJLOAD='XXXXXXX.SXVJLOAD',   File-AID SXVJLOAD
//*      ***DFSRRCOO PARAMETERS***
//      MBR=XIXATRPD,          PROGRAM NAME IN SXVJLOAD
//      PSB=IXDUPLD,          PSB NAME
//      BUF=,SPIE=,TEST=,      IMS REGION CONTROLLER PGM
//      EXCPVR=,RST=,PRLD=,    PARAMETERS FOR MORE INFO
//      SRCH=,CKPTID=,MON=,    ON THESE PARMS SEE THE
//      LOGA=,FMTO=,IMSID=,    IMS/VS SYSTEM PROGRAMMING
//      SWAP=,DBRC=,IRLM=,     REFERENCE MANUAL
//      IRLMNM=
//*
//*-----
//* STEP1: DLI JOB TO CREATE File-AID for IMS/DC'S AUDIT TRAIL REPORT
//*-----
//STEP1      EXEC   PGM=DFSRRCOO,REGION=&RGN,
//              PARM=(DLI,&MBR,&PSB,&BUF,
//              &SPIE&TEST&EXCPVR&RST,&PRLD,
//              &SRCH,&CKPTID,&MON,&LOGA,&FMTO,
//              &IMSID,&SWAP,&DBRC,&IRLM,&IRLMNM)
//STEPLIB    DD   DSN=&RESLIB,DISP=SHR
//              DD   DSN=&CXVJLOAD,DISP=SHR
//              DD   DSN=&SXVJLOAD,DISP=SHR
//              DD   DSN=CEE.SCEERUN,DISP=SHR
//DFSRESLB   DD   DSN=&SDFSRESL,DISP=SHR
//IMS        DD   DSN=&DBDLIB,DISP=SHR
//              DD   DSN=&PSBLIB,DISP=SHR
//DFSVSAMP   DD   DSN=&SDFSAC(&DFSVSAM),DISP=SHR
//SYSABEND   DD   SYSOUT=&PRINT,DCB=(LRECL=121,RECFM=VBA,BLKSIZE=3129),
//              SPACE=(125,(2500,100),RLSE,,ROUND)
//ABNLDUMP   DD   DUMMY
//IEFRDR     DD   DUMMY,DCB=BLKSIZE=100
//IXPAT      DD   DSN=&SEXTDSN,DISP=SHR
//IXDCLTDD   DD   DSN=&IXPDB,DISP=SHR
//*-----
//*IF USING DYNAMIC ALLOCATION UNCOMMENT THE FOLLOWING DD CARD
//*-----
//IXPIMSDY   DD   DUMMY
//IXPMLIB    DD   DSN=&MLIBDSN,DISP=SHR
//SYSOUT     DD   SYSOUT=&PRINT
//*
//          PEND
//*
//DLI        EXEC   ATRPDDLI
//*-----
//*      INSERT PROGRAM CONTROL CARD AFTER THE SYSIN DD STATEMENT
//*-----
//SYSIN      DD   *
//*
//

```

Figure 3-11. ATRPDDLI—DLIBATCH Procedure File-AID/CICS (JCL member XIXNATPD)

```

//ATRPDDLI PROC RGN=4M
//*
//* *****ATRPDDLI PARAMETERS*****
// PRINT='*', PRINT OUTPUT SYSOUT CLASS
// RESLIB='XXXXXXXX.SDFSRESL', IMS RESLIB
// DBDLIB='XXXXXXXX.DBDLIB', IMS DBD LIBRARY
// PSBLIB='XXXXXXXX.PSBLIB', IMS PSB LIBRARY
// SDFSAC='XXXXXXXX.SDFSAC', IMS PROCEDURE LIBRARY
// DFSVSAM='DFSVSAMP', SDFSAC MEMBER CONTAINING
// BUFFER POOL DATA
// SEXTDSN='XXXXXXXX.SORT.EXT', AUD TRAIL SORTED EXTRACT
// IXPDB='XXXXXXXX.IXCCLT', File-AID/DC CLT DATA BASE
// MLIBDSN='XXXXXXXX.SXVJMENU', File-AID/ISPF MLIB
// CXVJLOAD='XXXXXXXX.CXVJLOAD', File-AID CXVJLOAD
// SXVJLOAD='XXXXXXXX.SXVJLOAD', File-AID SXVJLOAD
//* *****DFSRRCOO PARAMETERS*****
// MBR=XIXATRPD, PROGRAM NAME IN SXVJLOAD
// PSB=IXDUPLD, PSB NAME
// BUF=,SPIE=,TEST=, IMS REGION CONTROLLER PGM
// EXCPVR=,RST=,PRLD=, PARAMETERS FOR MORE INFO
// SRCH=,CKPTID=,MON=, ON THESE PARMS SEE THE
// LOGA=,FMTO=,IMSID=, IMS/VB SYSTEM PROGRAMMING
// SWAP=,DBRC=,IRLM=, REFERENCE MANUAL
// IRLMNM=
//
//-----
// * STEP1: DLI JOB TO CREATE FILE-AID/CICS' AUDIT TRAIL REPORT
//-----
//STEP1 EXEC PGM=DFSRRCOO,REGION=&RGN,
// PARM=(DLI,&MBR,&PSB,&BUF,
// &SPIE&TEST&EXCPVR&RST,&PRLD,
// &SRCH,&CKPTID,&MON,&LOGA,&FMTO,
// &IMSID,&SWAP,&DBRC,&IRLM,&IRLMNM)
//STEPLIB DD DSN=&RESLIB,DISP=SHR
// DD DSN=&CXVJLOAD,DISP=SHR
// DD DSN=&SXVJLOAD,DISP=SHR
// DD DSN=CEE,SCEERUN,DISP=SHR
//DFSRESLB DD DSN=&RESLIB,DISP=SHR
//IMS DD DSN=&DBDLIB,DISP=SHR
// DD DSN=&PSBLIB,DISP=SHR
//DFSVSAMP DD DSN=&SDFSAC(&DFSVSAM),DISP=SHR
//SYSABEND DD SYSOUT=&PRINT,DCB=(LRECL=121,RECFM=VBA,BLKSIZE=3129),
// SPACE=(125,(2500,100),RLSE,,ROUND)
//ABNLDUMP DD DUMMY
//IEFRDER DD DUMMY,DCB=BLKSIZE=100
//IXPAT DD DSN=&SEXTDSN,DISP=SHR
//IXCCLTDD DD DSN=&IXPDB,DISP=SHR
//-----
// * IF USING DYNAMIC ALLOCATION UNCOMMENT THE FOLLOWING DD CARD
//-----
// * IXPIMSDY DD DUMMY
// * IXPMLIB DD DSN=&MLIBDSN,DISP=SHR
// * SYSOUT DD SYSOUT=&PRINT
// *
// PEND
// *
//DLI EXEC ATRPDDLI
// *
//-----
// * INSERT PROGRAM CONTROL CARD AFTER THE SYSIN DD STATEMENT
//-----
//SYSIN DD *
//

```

Audit Trail Report DD Statements

The following DD statements define the primary processing files required to run the Audit Trail Report program.

Table 3-4. Audit Trail Report Program DD Statements

DD Statement	Description
STEPLIB	Designates the IMS system dataset that contains the IMS nucleus, required action modules (&RESLIB), and the libraries where File-AID for IMS/ISPF load modules are stored (&CXVJLOAD and &SXVJLOAD).
DFSRESLB	Designates the IMS system dataset that contains the IMS nucleus and required action modules (&RESLIB). In ATRPDDLI and ATRPDBMP PROCs only.
IMS	Designates the IMS system datasets that contain the database description blocks (&DBDLIB) and the program specification blocks (&PSBLIB). In ATRPDDLI PROC only.
DFSVSAMP	Designates the dataset (&PROCLIB) and member (&DFSVSAM) that contain the control statements that describe the size and structure of the VSAM shared resource pool for File-AID for IMS' CLT control database. The buffers must be large enough to accept the largest segment size in the CLT control database. In ATRPDDLI PROC only.
SYSUDUMP	Produces a dump of user areas. The dump is formatted so that it can be printed directly.
IEFRDER	Designates the IMS log dataset. Because updates are not taking place, this dataset can be coded as DUMMY. In ATRPDDLI PROC only.
IXPAT	Designates the sorted Audit Trail Extract input files that contains the user database update activity that will appear on the Audit Trail Report.
IXDCLTDD IXCCLTDD	Designates File-AID for IMS' CLT control database (&IXPDB) that provides information to the report program. In ATRPDDLI PROC only.
IXPMLIB	Designates the library that contains File-AID for IMS/ISPF messages.
SYSOUT	Designates the output class for the Audit Trail Report.
SYSIN	The program control card follows this DD statement. For more information, refer to "Program Control Card" on page 3-12.

Parameters

The parameters on the PROC statement assign default values to symbolic parameters on the procedure statement. To override a default parameter value on the PROC statement, code the same parameter on the EXEC statement that calls the procedure.

The ATRPDDLI and ATRPDBMP parameters specify the sysout class, load libraries, and dataset names used when the program executes. These items are described in more detail in the preceding section.

The DFSRRCOO parameters are the IMS execution time parameters. For more information on these parameters, refer to IBM's *IMS System Programming Reference Manual*.

Program Control Card

A program control card is used to specify certain processing options to the Audit Trail Report Program. The card is entered after the SYSIN DD statement shown in the earlier JCL streams and is read by program XIXATRPD.

Following is a format of the processing options to be specified on the control card:

Table 3-5. Program Card Processing Options

Field	Start Posn	End Posn	Description
Print Only Changed Fields	1	1	Y When printing the before and after images of a segment that were updated, print only those fields that the user changed. Unchanged fields are excluded from printing. All fields in inserted, repeated, and deleted segment images are printed. N Print all fields in all segment images. If not specified, N is the default.
Report Mode	2	2	F Print the Audit Trail Report in formatted mode, using segment layouts. H Print the Audit Trail Report in unformatted, three-line hexadecimal mode. If not specified, F is the default.
Maximum Print Line Per Page	3	4	Specify any value from 20 to 99. If not specified, 60 is the default.
Spacing Before Segment Header	5	5	Designates the number of blank lines to appear before each printed segment image. The value can be from 1 (one blank line) to 5 (five blank lines) or T (start printing each segment image at the top of a page). If not specified, 2 is the default.

The following example shows the correct coding of the XIXATRPD program control card for formatted printing of only the changed fields on updated segment images, with 66 print lines per page, and three blank lines appearing before each segment image:

```
//SYSIN      DD *
YF663
```

Audit Trail Report Return Codes

An Audit Trail Report return code (RC) appears in the output listing. For return code 16, an error message that indicates the specific problem also appears in the listing. In general, the return codes can be summarized as follows:

<u>RC</u>	<u>Explanation</u>	<u>Error Description</u>
0	job ran to completion	none
4	job ran to completion	none
16	job aborted, severe error	input or system error

Audit Trail Report

The Audit Trail Report produced when program XIXATRPD is executed consists of two parts:

1. The contents of the sorted Audit Trail Extract files, which are printed in formatted or hexadecimal mode, depending on what was specified for the Report Mode field on the program control card.
2. A summary of the processing options specified on the program control card.

Figure 3-16 on page 3-25 through Figure 3-20 on page 3-28 are samples of formatted and hexadecimal Audit Trail Reports.

Each page of the Audit Trail Report begins with page headings consisting of the report title, page number, and the date and time the report was generated.

Preceding the segment images of each user database update as it appears on the report are Audit Trail Segment Headings. These headings always consist of at least two lines and may consist of several lines. The first line contains the user database DBD name and optional description, the user's ID, and the logical terminal ID of the user's terminal. The second segment heading line contains the segment name and optional description, the segment's hierarchical level number in its database, and the edit sub-option (Formatted, Unformatted, or Index) that was in use when the update was made. At the end of the second segment heading line appears the phrase "SEGMENT update action ON date AT time." Update action can be INSERTED (for an inserted or repeated segment), DELETED, or UPDATED. The date and time show when the segment update action was taken.

For a multiple record type segment, the RCD TYPE 1 and 2 values are printed on a third segment heading line. If either record type value contains non-displayable data, it appears in a three-line hexadecimal format.

For a keyed segment, the last segment heading lines shows the fully concatenated key to that segment. The length of the fully concatenated key dictates the number of print lines shown. The key values for each segment type represented in the fully concatenated key are separated by commas. If any individual key value contains non-displayable data, the entire fully concatenated key appears in a three-line hexadecimal format.

The format used in printing each segment image depends on what you specified for the Report Mode field on the XIXATRPD program control card. Each of these formats (formatted and unformatted) are described in subsequent topics.

Formatted Report Contents

When printing a formatted report of an Audit Trail segment image, File-AID *for IMS* uses the segment layout that was loaded into the CLT control database for that segment type. Refer to Appendix F, "File-AID for IMS/CICS or File-AID for IMS/DC Batch DBD and XREF Update" in the *File-AID Single Install Image Installation and Configuration Guide* for information on how to load segment layouts onto the CLT control database. The first two columns shown for each segment image contain the Level Number/Data-Name and Format of each field in the segment layout, which is similar to the File-AID *for IMS* Edit Formatted sub-option. Refer to page "Edit Formatted Mode" on page 2-17 for a description of the Format column.

The next two columns on the report are the Before and After Field Value columns. The way in which these columns are formatted depends on the segment update action shown on the second segment heading line as follows:

- When the update action is INSERTED, the After Field Value column contains the value of each field in the segment that was created. The Before Field Value column is always empty.
- When the update action is DELETED, the Before Field Value column contains the value of each field in the segment that was deleted. The After Field Value column is always empty.
- When the update action is UPDATED, the Before Field Value column contains the value of each field in the segment as it was before the change. The After Field Value column shows the new field value only for the fields that were changed. The After Field Value column is blank for unchanged fields.

Field values are shown in the Before and After Field Value columns similar to the Edit Formatted sub-option (page 2-19), with one exception. In Edit Formatted, fields with invalid or unprintable data (given their field format) are represented by the word

"INVALID." On the Audit Trail Report, invalid field contents are shown in a three-line hexadecimal format.

The rightmost column on the formatted Audit Trail Report is for informational messages. Following are the situations in which a message is printed:

- When an alphanumeric field was changed from a non-blank value to blanks (hex 40s), the message "CHANGED TO SPACES" is printed. This process enables you to distinguish between fields that weren't changed and those that were blanked out.
- When a field has been changed from a valid value to an invalid value, or when a field in an inserted segment contains an invalid value, "AFTER FIELD INVALID" is printed.
- When a field value was changed from an invalid value to a valid value or when a field in a deleted segment contains an invalid value, "BEFORE FIELD INVALID" is printed.
- When an unchanged field contains an invalid value, "FIELD INVALID" is printed.
- When a field was changed and both the before and after field values are invalid, "BOTH FIELDS INVALID" is printed.

When the segment layout contains an OCCURS DEPENDING ON clause and the value of the object of the OCCURS DEPENDING ON was changed, either "n OCCURS ADDED" or "n OCCURS DELETED" is printed at the end of the segment layout. N is the number of occurrences that were added or deleted (COBOL only).

If File-AID *for IMS* is unable to print a particular Audit Trail segment in the formatted manner, that segment is printed in an unformatted, hexadecimal manner preceded by one or more error messages that indicate the problem. Following are some reasons why File-AID *for IMS* switches from formatted to unformatted printing:

- The record type value in the before and/or after segment image was not found on the CLT control database.
- The segment layout for the before and/or after segment image was not found on the CLT control database.
- The segment layout for the before and/or after segment image contains an OCCURS DEPENDING ON clause and the value for the object of the OCCURS DEPENDING ON is non-numeric, outside the occurrence range defined in the segment layout, or causes the length of the segment to exceed the maximum segment length as defined in the database DBD (COBOL only).

When a user updates an existing database segment, both a BEFORE and AFTER image of the segment is written to the Audit Trail control database. You have the option of specifying on the XIXATRPD program control card that only the specific fields within the segment that the user changed be printed on the Audit Trail Report. This process causes all unchanged fields within the segment to be excluded from printing.

Unchanged fields that are not printed are replaced by a dashed print line ending with the phrase "x LINES/y BYTES NOT PRINTED," where x is the number of excluded print lines, and y is the number of bytes of segment data not printed.

For keyed segments, the fields making up the key value are always printed. Additionally, all higher level group data-names leading down to printed, changed fields are also printed. All fields in inserted and deleted segment images are always printed.

Unformatted Report Contents

All or part of the Audit Trail Report may appear in an unformatted mode for the following reasons:

1. Unformatted is specified for the Report Mode field on the XIXATRPD program control card.

- Formatted is specified for the Report Mode, but File-AID *for IMS* is unable to print an Audit Trail segment in the formatted manner. Refer to "Formatted Report Contents" on page 3-21 for a description of the situations where File-AID *for IMS* has to switch from formatted to unformatted.

When printing the Audit Trail contents in the unformatted manner, File-AID *for IMS* shows each segment image in a three-line format similar to the hexadecimal mode of the Edit Unformatted sub-option. The top line represents the character representation of the segment, the middle line represents the upper half byte of each character in HEX, and the third line represents the lower half byte of each character in HEX. When a character is not displayable, it is represented by a period on the top line.

Up to 100 positions of the segment are printed in each set of three lines. The Seg Positions column immediately to the left of the segment contents indicates the starting and ending positions in the segment represented by each set of three lines.

When the update action shown on the second segment heading line is INSERTED, the Before/After column to the left of the inserted segment's image contains AFTER. When the update action shown is DELETED, the Before/After column contains BEFORE for the deleted segment's image. When the update action shown is UPDATED, the entire pre-change segment image is shown, with BEFORE in the Before/After column, followed by the entire post-change segment image, with AFTER in the Before/After column.

When showing the before and after images of a changed segment, the Audit Trail Report also indicates the segment positions that were changed. For both the before and after segment images, the positions that were changed are indicated by a bold-faced dash under each position. For each three line set of print lines that contains changed segment positions, the bold-faced word CHANGE is printed to the left and below the print lines, on the same line as the dashes.

If the segment updated during the edit session was variable length and you increased the length of the segment, File-AID *for IMS* indicates the added segment positions by printing a bold-faced plus sign under each new position in the AFTER segment image. If you decreased the length of a variable length segment, the deleted segment positions are indicated by plus signs under the BEFORE segment image. In both situations, the bold-faced word CHANGE appears to the left on the same line as the plus signs.

For keyed segments, the segment positions that make up the key value are indicated by a bold-faced asterisk under each position.

As when printing the Audit Trail Report in the formatted manner, you have the option of specifying on the XIXATRPD program control card that only the specific fields, within an updated segment, that the user changed be printed in unformatted mode. Because a segment's contents in unformatted mode are printed in 100-byte long increments, the changed segment positions are printed as part of a 100-byte increment. Each 100-byte increment within a segment that does not contain any changed data is excluded from printing.

Increments of 100 characters that are not printed are replaced by a dashed print line containing the phrase "x POSITIONS NOT PRINTED," where x is the number of segment positions not printed.

All positions in inserted and deleted segment images are always printed.

Summary Information

Figure 3-21 on page 3-28 is the last page of the Audit Trail Report. This page contains the reporting options that were specified on the XIXATRPD program control card:

- The Report Mode (Formatted or Unformatted).
- The Maximum Print Lines Per Page.

Figure 3-15. Selection Criteria Summary - Page 4

```

File-AID for IMS                AUDIT TRAIL DATA BASE TO FILE EXTRACT REPORT                PAGE 4
                                SELECTION CRITERIA SUMMARY                                DATE 2007-07-07
                                                                TIME 08:36:16
                                RELATIONAL
                                FIELD VALUE
-----
DATA-NAME          START  LENGTH  FORMAT  OPERATOR
-----
FORMATTED FIELD SELECTION CRITERIA          1
AT-DBD-NAME          4      8      C      8      K      =      PORDR

SELECTION DETAIL BY CRITERIA FOR AT          SELECTION DETAIL BY CRITERIA FOR AT
UNFORMATTED CRITERIA NO          COUNT OF ROOTS SELECTED
-----
1                                  3
FORMATTED CRITERIA NO          COUNT OF ROOTS SELECTED
-----
1                                  3

**** E N D   O F   R E P O R T ****
    
```

Figure 3-16. Audit Trail Report - Formatted Print Mode-Page 1

```

File-AID for IMS                File-AID for IMS/DC/CICS AUDIT TRAIL REPORT                PAGE 1
                                                                DATE 2007-07-07
                                                                TIME 09:06:27

DBD NAME:   LORDR   LOGICAL ORDER DATA BASE   USERID:   CW   LTERM:   CWX78A50
SEGMENT NAME:  ORDR030   ORDER STATUS   LVL:   3   EDIT SUB OPTION:  UNFORMAT
TED   SEGMENT UPDATED ON 03/16/1997 AT 08:46:

CONCAT KEY:  AA2222,01,01

NAME          LEVEL NUMBER/DATA-          BEFORE FIELD VALUE          AFTER FIELD VALUE          MESSAGE
              FORMAT
-----
01 STATUS-DATA
05 STATUS-KEY
07 PROCESS-INDICATOR          Z  2  K  01
05 MATERIAL-TYPE-INDICATOR    C  2   QA
05 BEGIN-PROCESS-QTY          PS 5 2 24.00
05 END-PROCESS-QTY            PS 5 2 24.00
05 PROCESS-STATUS-
CODE          C  2   OK          AFTER FIELD INVALID
                                                00
                                                11

05 DESCRIPTION          C 15  CUTTING
05 FIRST-ACTIVITY-DATE    Z  8  20070214
05 LAST-ACTIVITY-DATE     Z  8  20070306
** END OF LAYOUT. LENGTH = 45 **
    
```

Figure 3-17. Audit Trail Report - Formatted Print Mode-Page 2

File-AID for IMS		File-AID for IMS/DC/CICS AUDIT TRAIL REPORT		PAGE	2
				DATE	2007-07-07
				TIME	09:06:27
DBD NAME: PORDR		PHYSICAL ORDER DATA BASE		USERID:	CW
SEGMENT NAME: ORDR020		ORDER LINE		LVL:	2
D		SEGMENT INSERTED ON 09/05/90 AT 08:52:01		LTERM:	CWX78A50
				EDIT SUB OPTION:	FORMATTE
CONCAT KEY: AA8888,05					
NAME	LEVEL NUMBER/DATA-FORMAT	BEFORE FIELD VALUE	AFTER FIELD VALUE	MESSAGE	
01	ORDER-LINE-DATA-PO				
05	SEGMENT-LENGTH	BS 4			178
05	ORDER-LINE-KEY				
07	LINE-NUMBER	C 2	K		05
05	ORDER-TYPE	C 2			PO
05	LINE-STATUS	C 7			
05	PART-NO	C 6			
05	DESCRIPTION	C 30			
05	UNIT-OF-MEASURE	C 2			
05	PURCHASE-ORDER-INFO				
07	PO-CODE	C 4			
07	PO-NUMBER	C 12			
07	PO-COMPANY	C 30			
07	PO-VENDOR-NUMBER	C 5			
07	PO-VENDOR-CODE	C 5			
05	FILLER	C 30			
05	ORDER-QUANTITIES				
07	QTY-ORDERED	PS 5			0
07	QTY-BACKORDERED	PS 5			0
07	QTY-SHIPPED	PS 5			0
05	PURCHASE-ORDER-PRICE-INFO				
07	LIST-PRICE	PS 5	2		0.00
07	DISCOUNT-AMOUNT	PS 5	2		0.00
07	NET-PRICE	PS 5	2		0.00
05	PROCUREMENT-CODE	C 2			
05	BUYER-CODE	C 2			
05	FIRST-ACTIVITY-DATE	C 8			
05	LAST-ACTIVITY-DATE	C 8			

Figure 3-18. Audit Trail Report - Formatted Print Mode-Page 3

File-AID for IMS		File-AID for IMS/DC/CICS AUDIT TRAIL REPORT				PAGE 3
						DATE 2007-07-07
						TIME 09:06:27
DBD NAME: PORDR PHYSICAL ORDER DATA BASE		USERID: CW		LTERM: CWX78A50		
SEGMENT NAME:ORDR020 ORDER LINE LVL:2		EDIT SUB OPTION:FORMATTED		EGMENT UPDATED ON 03/16/2007 AT 08:57:		
CONCAT KEY: AA8888,05						
LEVEL NUMBER/DATA-NAME	FORMAT	BEFORE FIELD VALUE	AFTER FIELD VALUE	MESSAGE		

01	ORDER-LINE-DATA-PO					
05	SEGMENT-LENGTH	BS 4	178			
05	ORDER-LINE-KEY					
07	LINE-NUMBER	C 2 K	05			
05	ORDER-TYPE	C 2	PO			
05	LINE-STATUS	C 7			OPEN	
05	PART-NO	C 6			UX1095	
05	DESCRIPTION	C 30			RED COAXIAL CABLE	
05	UNIT-OF-MEASURE	C 2			EA	
05	PURCHASE-ORDER-INFO					
07	PO-CODE	C 4			QXXX	
07	PO-NUMBER	C 12			AA2222-	
07	PO-COMPANY	C 30			ZENITH WIRE	
07	PO-VENDOR-NUMBER	C 5			2224	
07	PO-VENDOR-CODE	C 5			34552	
05	FILLER	C 30				
05	ORDER-QUANTITIES					
07	QTY-ORDERED	PS 5	0		20	
07	QTY-BACKORDERED	PS 5	0		2	
07	QTY-SHIPPED	PS 5	0		15	
05	PURCHASE-ORDER-PRICE-INFO					
07	LIST-PRICE	PS 5 2	0.00		0.53	
07	DISCOUNT-AMOUNT	PS 5 2	0.00			
07	NET-PRICE	PS 5 2	0.00		0.53	
05	PROCUREMENT-CODE	C 2			AS	
05	BUYER-CODE	C 2			TC	
05	FIRST-ACTIVITY-DATE	C 8			19890910	
05	LAST-ACTIVITY-DATE	C 8			19891012	
** END OF LAYOUT. LENGTH = 178 **						

Figure 3-19. Audit Trail Report - Hexadecimal Print Mode-Page 1

File-AID for IMS		File-AID for IMS/DC/CICS AUDIT TRAIL REPORT				PAGE 1				
						DATE 2007-07-07				
						TIME 09:33:37				
DBD NAME: LORDR LOGICAL ORDER DATA BASE		USERID: CW		LTERM: CWX78A50						
SEGMENTNAME ORDR030 ORDER STATUS LVL:3		EDIT SUB OPTION:UNFORMATTED		SEGMENT UPDATED ON03/16/1997 AT08:46						
CONCAT KEY: AA2222,01,01										
	1	2	3	4	5	6	7	8	9	10
BEFORE/AFTER	SEG	POSITIONS	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
BEFORE	1	45	01QA... .OKCUTTING 1988021419880306 FFDC00400040DDCEEECD44444444FFFFFFFFFFFFFFFF 0181020C020C623433957000000001988021419880306							
CHANGE			** - -							
AFTER	1	45	01QA... .CUTTING 1988021419880306 FFDC0040004000CEEECD44444444FFFFFFFFFFFFFFFF 0181020C020C113433957000000001988021419880306							
CHANGE			** - -							
DBD NAME: LORDR LOGICAL ORDER DATA BASE		USERID: CW		LTERM: CWX78A50						
SEGMENT NAME: ORDR030 ORDER STATUS LVL:3		EDIT SUB OPTION: INDEX		GMENT DELETED ON 09/05/07 AT 08:50:16						
CONCAT KEY: AA4444,01,04										
	1	2	3	4	5	6	7	8	9	10
BEFORE/AFTER	SEG	POSITIONS	12345678901234567890123456789012345678901234567890123456789012345678901234567890							
BEFORE	1	45	04WA.....BDFINISHING 19880902 FFEC00200020CCCCDCECCDC44444444FFFFFFFF44444444							

Chapter 4.

Maintaining File-AID *for IMS*

The following environmental changes will necessitate maintenance of File-AID *for IMS*:

- Space requirements change for a control database.
- A new version of IMS is installed.
- Segment size requirements change for the Audit Trail control database.
- Additional user databases need to be accessed.
- The security exit was updated.
- A control database needs tuning.
- The CLT control segment was inadvertently updated or deleted.
- Additional transactions are added.
- A user database's structure or segment layout changes.
- New terminal screen sizes are added to the system.
- Periodic back-up of the control databases.
- Restoring a damaged control database.

These situations and how to deal with them are briefly explained below. For more detailed information, refer to Chapter 12, "Verifying File-AID Installation" in the *File-AID Single Install Image Installation and Configuration Guide*

Control Database Space Requirements Change

Space requirements can change for the following reasons:

- Number of File-AID *for IMS* users changes
- Number of user databases changes
- Number of segment layouts changes
- Average number of updates made to sensitive user databases changes

In the first case, the size of the LTM control database will change. In the next two cases, the size of the CLT control database will change. In the last case, the size of the Audit Trail control database will change. The following procedure must be followed:

1. Unload the control database.
2. Delete the control database.
3. Allocate the new control database with the correct size.
4. If the DBD needs to be changed (for example, the randomizer parameters change), generate a new DBD.
5. Reload the control database using the new DBD.
6. Regenerate the ACB control blocks used by File-AID *for IMS*.

The JCL required for the above steps is supplied with File-AID *for IMS*.

New Version of IMS Installed

When a new version of IMS is installed, the installation parameters of File-AID *for IMS* must be updated. After the installation parameters are updated, they must be linked again into the main load module.

Audit Trail Control Database Segment Size Requirements Change

As mentioned in “System Overview” on page 1-11, the Audit Trail control database contains the captured update activity that was processed against selected user databases. The segment sizes for the Audit Trail database are determined during the installation process. However, if a user database whose updates are to be captured by the Audit Trail feature contains a very large segment type, the segment sizes for the Audit Trail control database may not be sufficient to capture the updates. If this happens, you can decide to not invoke the Audit Trail feature for the offending database or you can increase the Audit Trail database’s segment sizes. Do the following to increase the sizes:

1. Unload the Audit Trail database.
2. Delete and redefine the database dataset with the correct sizes.
3. Update the Audit Trail DBD to reflect the new segment lengths. Refer to the *File-AID Single Install Image Installation and Configuration Guide* for recommended lengths.
4. Reload the Audit Trail database using the updated DBD.
5. Regenerate the ACB control blocks used by File-AID *for IMS*.

The JCL required for all the above steps is supplied with File-AID *for IMS*.

Access Additional User Databases

When additional user databases need to be accessed, they must be defined to File-AID *for IMS* by doing the following:

1. Add the PCB for the new user database to the appropriate PSB.
2. Regenerate the PSB control block.
3. Regenerate the ACB.
4. Execute the DBD Update Facility job as outlined in Appendix F, “File-AID for IMS/CICS or File-AID for IMS/DC Batch DBD and XREF Update” in the *File-AID Single Install Image Installation and Configuration Guide*.
5. Optionally execute the XREF Update Facility outlined in Appendix F, “File-AID for IMS/CICS or File-AID for IMS/DC Batch DBD and XREF Update” in the *File-AID Single Install Image Installation and Configuration Guide*.

The JCL required for all the above steps is supplied with File-AID *for IMS*.

Security Exit Updated

If the File-AID *for IMS* security exit is updated, it must be linked again into the IXDMAIN load module for File-AID *for IMS/DC* or the IXCMAIN load module for File-AID *for IMS/CICS*.

Control Database Needs Tuning

The control databases are organized with a simple HDAM without logical relationships between them. Although installation parameters believed to be optimal are recommended, your installation can have different environmental conditions that require minor tuning of the DBD parameters to increase performance. The following specific parameters can be altered:

- Underlying dataset organizations
- Randomizer used
- Device type
- Dataset size
- Root addressable area size (RBN)

Other parameters such as the access method or pointer types must not be changed.

If the DBD is altered after the initial installation of File-AID *for IMS*, the procedure to follow is the same as the one used for space requirement changes described in “Control Database Space Requirements Change” on page 4-1.

CLT Control Segment Inadvertently Updated or Deleted

A control segment on the CLT control database stores various counts and fields used to verify the database's integrity. If this segment is inadvertently updated or deleted, it must be rebuilt to ensure accurate processing of your databases. The Rebuild Control Segment program (XIXREBLD) reads the File-AID *for IMS* database, calculates and accumulates control field information for each segment, and either inserts or replaces the new control segment. The Rebuild Control Segment program can be run as a batch DLL, IMS BMP, or CICS shared database program using the JCL supplied.

You will need to run XIXREBLD when the following conditions occur:

- An abend screen is displayed online with message D204:
File-AID *for IMS's* DBD DATABASE IS MISSING ITS CONTROL SEGMENT
- An abend screen is displayed online with message D205:
File-AID *for IMS's* DBD DATABASE CONTAINS INVALID DBD DATA
- The Batch XREF Update Facility terminates with a return code of 8 and the Summary report prints the message:

```
ONLINE CONTROL INFORMATION SEGMENT NOT FOUND. IF DBD UPDATE FACILITY HAS
NEVER BEEN RUN, RUN IT FIRST. OTHERWISE, RUN MAINTENANCE UTILITY TO REBUILD
CONTROL INFORMATION SEGMENT
```

Additional Transactions Added

Additional transactions can be added to access File-AID *for IMS*. These new transactions can be used to access a different set of databases or may have different security requirements. In general, you must do the following to add transactions:

File-AID *for IMS/DC*

1. Generate the new transaction using the IMS Stage One procedure at your installation.
2. Generate a new PSB for the transaction.
3. Generate a new ACB.
4. ALIAS the main File-AID *for IMS/DC* load module to the new PSB/ACB name.

File-AID *for IMS/CICS*

1. Generate the new transaction using the Resource Definition procedures at your installation.
2. Generate a new PSB for the transaction. Make sure that the last four characters of the PSB name match the transaction code.
3. Generate a new ACB.

User Database's Structure or Segment Layout Changes

File-AID *for IMS* must be informed of any structure or segment layout changes of the user databases. This is done by running the DBD Update, XREF Update Facility, or both as described in Appendix F, "File-AID for IMS/CICS or File-AID for IMS/DC Batch DBD and XREF Update" in the *File-AID Single Install Image Installation and Configuration Guide*.

New Terminal Screen Sizes Added

The screen sizes for File-AID *for IMS/DC* and File-AID *for IMS/CICS* follow.

File-AID *for IMS/DC*

If new terminal screen sizes are added to your IMS system after the initial installation of File-AID *for IMS/DC*, MFS formats must be generated for them. The original MFS source code shipped with File-AID *for IMS/DC* contains all the format types needed for your installation. Refer to “MFS Tailoring” in the *File-AID Single Install Image Installation and Configuration Guide* for additional information.

File-AID *for IMS/CICS*

If new terminal screen sizes are added to your CICS system after the initial installation of File-AID *for IMS/CICS* and you did not link edit all mapset load modules during the initial installation, then you must link edit the corresponding load modules. The original load library shipped with File-AID *for IMS/CICS* contains all the mapset load modules needed for your installation. Refer to “BMS Maps” in the *File-AID Single Install Image Installation and Configuration Guide* for additional information.

Periodic Backup of Control Databases

To allow the restoration of the CLT and Audit Trail control databases in the event that either is physically damaged, image copy backups should be taken periodically. Because of the temporary nature of the LTM control database, its data does not need to be backed up. JCL to create an image copy of the CLT and Audit Trail databases is supplied with File-AID *for IMS*.

Restoring a Damaged Control Database

If any control database is physically damaged or is unusable it must be restored. Use IBM's Data Base Recovery Utility with the latest image copy and log tapes, to restore the CLT and Audit Trail databases. To restore the LTM database, simply reallocate and initialize it. The LTM database does not need to be restored from a back-up because of the temporary nature of its data. The JCL to restore and reallocate the control databases is supplied with File-AID *for IMS*.

Chapter 5.

File-AID for IMS/ISPF Selection Criteria

When you execute the Audit Trail Extract function in File-AID for IMS/CICS or File-AID for IMS/DC, you can apply existing selection criteria. Existing selection criteria are created and maintained through Option 6 of File-AID for IMS/ISPF.

Option 6, Selection, is used to create, modify, and apply field and segment selection criteria to all segments in the primary IMS database. The purpose of selection criteria is to enable you to selectively process a subset of the segments in a database using a set of rules (or criteria) to create the subset.

The two kinds of selection criteria are existing and temporary. File-AID for IMS/CICS and File-AID for IMS/DC only support existing selection criteria. File-AID for IMS/ISPF supports both. Each kind of selection criteria can be applied to root segments in the Extract function.

Existing selection criteria are created and maintained in the Selection Criteria function of File-AID for IMS, Option 6. Existing selection criteria are stored in a cataloged dataset for use in the functions where you can apply them. The Selection Criteria option consists of the following:

- Specifying the selection criteria dataset to edit.
- Editing the existing selection criteria.

Selection Criteria Specification

The Selection Criteria - Dataset Specification screen, shown in Figure 5-1 on page 5-1, is the first screen displayed when you invoke Option 6 of File-AID for IMS/ISPF.

Figure 5-1. Selection Criteria - Dataset Specification Screen

```

File-AID for IMS --- Selection Criteria - Dataset Specification -----
COMMAND ==>
ENV: TEST - IMS ENVIRONMENT

+ Selection criteria Dataset . . 'CW.FISAMP.SELCRIT'
      Member . . . . . (Blank or pattern for member list)
-----
Enter DBD dataset name to which selection criteria will be applied:
+ DBDLIB Dataset 1 . . 'CW.FISAMP.DBDLIB'
      Dataset 2 . . .
      Member . . PORDR (New criteria - Specify member or
                        blank for list
                        Existing criteria - Member ignored)
-----
Use application relationships . . Y (Y = Yes; N = No)
+ Appl relationship Dataset . . 'CW.FISAMP.APPLREL'
-----
      Use COBOL layouts . . . Y (Y - Required for formatted selection
                                N - Segment/unformatted selection)
+ Segment/Layout XREF dataset . 'CW.FISAMP.XREFC'
      Member . . . . . (Blank or pattern for member list)

      + COBOL layout Dataset 1 . 'CW.FISAMP.COBOLLIB'
        Dataset 2 . . .

```

Note: The presence of a highlighted plus (+) or minus (-) sign indicates dataset concatenations. Refer to the chapter entitled “Datasets” in the *File-AID for IMS/ISPF Reference* manual for additional information.

Selection Criteria Dataset : Enter the selection criteria dataset you want to edit. The dataset must conform to the characteristics of a valid selection criteria dataset.

Member : Enter the name of the member in the selection criteria dataset. If the field is left blank or a pattern is specified, a member list is displayed. Select a member from the list.

DBDLIB Dataset 1 and Dataset 2 : Enter one or two DBD load library dataset names. If you enter one DBD load library name, you can enter it on either of the dataset name lines. If you enter two DBD load library names and their block sizes are different, you must enter the library with the larger block size on the first dataset name line.

Member : Enter the DBD member that describes the database that you want to create selection criteria for. If two DBD libraries are entered, File-AID *for IMS* searches the first before the second to locate the DBD member.

When you create a new selection criteria dataset or member, it will contain the DBD member name you specify in this section of the screen. When you edit the selection criteria at a later time, the DBD Member field on the screen is ignored and the one contained in the selection criteria is used.

Use Application Relationships : Indicate whether you want to define the selection criteria with an application relationship.

Appl Relationship Dataset : You must enter the application relationship dataset name when using an application relationship. Either the DBD member name specified on the screen for a new selection criteria file or the DBD name in an existing selection criteria file is used as the member name for the application relationship dataset.

Note: The following fields are functional only within File-AID *for IMS/ISPF*. The text is only informational.

Use Layouts : Indicate whether segment layouts are to be used to define the selection criteria. If you intend to create or edit formatted field selection criteria, you must enter Y in this field.

If your installation has both the COBOL and PL/I language support options of File-AID *for IMS*, you must ensure that your current language mode is compatible with the segment layout and segment/layout XREF dataset information you specify. Your current language mode is indicated by either the word COBOL or PL/I preceding the Use Layouts and Layout Dataset fields.

To change the language mode, enter the COBOL or PL/I primary command or enter the =0 jump command, which switches you to Option 0, File-AID *for IMS* Parameters.

Segment/Layout XREF Dataset and Member : When you create a new selection criteria dataset or member that contains formatted field selection criteria, it is assigned a single record type status or multi-record type status based on the information contained in the segment/layout XREF member. The segment/layout XREF member, created and maintained using Option 7, is described in detail in Chapter 6, “File-AID for IMS/ISPF Segment/Layout Cross Reference”.

When you edit the selection criteria at a later time, the segment/layout XREF information must result in the same record type (single or multiple) as originally specified when the selection criteria were created. If the segment/layout XREF information you enter results in a type different from the original, the message RECORD TYPE CONFLICT is displayed, and you cannot edit the selection criteria.

When you create a new selection criteria dataset or member that does not contain formatted field selection criteria, it is not assigned a record type status. You can later

edit the selection criteria regardless of the Use Layouts indicator you specify at the time.

If your installation has both COBOL and PL/I language support options of File-AID *for IMS* installed, when you create a new selection criteria dataset or member that contains formatted field selection criteria, it is assigned a language status of COBOL or PL/I based on your current language mode. When you edit the selection criteria at a later time, you must be in the same language mode that the selection criteria were originally created. If your language mode is different than the selection criteria's language status, the message "SLCTN CRIT/LANG CONFLICT" is displayed, and you cannot edit the selection criteria.

A language status is not assigned to selection criteria datasets that do not contain formatted field selection criteria. You can later edit the selection criteria regardless of your language mode at the time.

Layout Dataset 1 and Dataset 2 : Enter the dataset names where the layouts specified by the segment/layout XREF reside.

If you enter one segment layout dataset name, you can enter it on either line. If you enter two segment layout dataset names, they can appear in any order. Each library can be any of the valid segment layout library organization types.

Terminating the Screen

Do one of the following to terminate the Selection Criteria - Dataset Specification screen:

- Press ENTER to proceed to the next screen. Depending on the information entered, you can receive up to three member list screens:
 - One for the selection criteria dataset.
 - One for the DBD load library dataset.
 - One for the segment/layout XREF dataset.
- Enter the END, RETURN, or jump command to leave the selection criteria option.

Error Summary

If you are editing selection criteria that you previously created in Option 6, after you press ENTER on the Selection Criteria - Dataset Specification screen, File-AID *for IMS* reads the selection criteria dataset and matches it with the segment/layout XREF information. If errors are found in the matching process, the Selection Criteria Error Summary screen is displayed.

Figure 5-2. Selection Criteria Error Summary Screen

```

File-AID for IMS -- Selection Criteria Error Summary ---- APPL REL MISMATCH
COMMAND ==>

MISMATCH BETWEEN DBD AND SELECTION CRITERIA MEMBER
MISMATCH BETWEEN APPLICATION RELATIONSHIPS AND SELECTION CRITERIA MEMBER

Datasets used when last save was made:
      DBDLIB dataset 1: 'CW.FISAMP.DBDLIB1'
      Dataset 2: 'CW.FISAMP.DBDLIB2'
      Member: PORDR

      Appl relationship dataset: 'CW.FISAMP.APPLREL'
      Segment/Layout XREF dataset: 'CW.FISAMP.XREF'
      Member:

      COBOL layout dataset 1: 'CW.FISAMP.COBOLIB1'
      Dataset 2: 'CW.FISAMP.COBOLIB2'

Press ENTER to ignore mismatches and continue editing this member
Enter END to return to the previous panel without saving this member
    
```

Error Messages : Errors can occur in the matching process for any of the following reasons:

- Incorrect segment layout or segment/layout XREF information was entered on the Selection Criteria - Dataset Specification screen.
- The segment layouts used to create the formatted field selection criteria has changed.
- The segment/layout XREF used to create the formatted field selection criteria has changed.
- The application relationships applied to the selection criteria have changed.
- The selection criteria have been modified outside Option 6 (for example, in ISPF/PDF Option 2).

Table 5-1. Selection Criteria - Validation Errors

<p>MISMATCH BETWEEN DBD AND SELECTION CRITERIA MEMBER</p> <p>This error can occur if the DBD definitions were changed since the file was last saved. File-AID for IMS deletes the DBDs no longer defined when you edit and save the selection criteria. Following are the most likely causes:</p> <ul style="list-style-type: none"> • Logical DBDs were added and/or deleted in the DBD since the selection criteria were last edited. • The selection criteria were modified outside Option 6.
<p>MISMATCH BETWEEN APPLICATION RELATIONSHIPS AND SELECTION CRITERIA MEMBER</p> <p>This error can occur when the selection criteria contain target DBDs that are no longer defined in the application relationship or the DBD definition has changed. File-AID for IMS deletes the DBDs no longer defined when you edit and save the selection criteria. Following are the most likely causes:</p> <ul style="list-style-type: none"> • Target DBDs were added and/or deleted in the application relationship since the selection criteria were last edited. • Logical DBDs were added and/or deleted in the DBD since the selection criteria were last edited. • Application relationships were not applied when the selection criteria were previously defined with application relationships. • The selection criteria were modified outside Option 6.

Table 5-1. Selection Criteria - Validation Errors

<p>MISMATCH BETWEEN SEG/LAYOUT XREF AND SELECTION CRITERIA MEMBER</p> <p>This error can occur for both single and multi-record type formatted field selection criteria. For a single record type, the error occurs when File-AID for IMS attempts to look up the segment/layout XREF and retrieve the segment layout. For multi-record type, the error occurs when File-AID for IMS attempts to look up the record type values in the segment/layout XREF and retrieve the segment layout. Following are the most likely causes:</p> <ul style="list-style-type: none"> • The wrong segment/layout XREF dataset was specified. • The correct segment/layout XREF was specified, but it has changed since the selection criteria were last edited. • The selection criteria were modified outside Option 6.
<p>MISMATCH BETWEEN COBOL/PL/I LAYOUT AND SELECTION CRITERIA MEMBER</p> <p>This error can occur when a segment layout changes. For example, the starting position in the layout was changed or the data type was changed for fields where formatted selection criteria were entered. File-AID for IMS discards the selection criteria for the mismatched field. Following are the most likely causes:</p> <ul style="list-style-type: none"> • The COBOL or PL/I layout has changed since the selection criteria were last saved. • The selection criteria have been modified outside Option 6.
<p>INVALID OR MISSING RECORD-SKIPPED TO NEXT VALID CRITERIA</p> <p>This error occurs when File-AID for IMS encounters an invalid record or determines that a record is missing from the selection criteria dataset. File-AID for IMS attempts to skip to the next valid set of field selection criteria. This error can occur when the selection criteria were modified outside Option 6.</p>

Datasets Used When Last Save Was Made : Displays information about the DBDLIB, application relationship, segment layout XREF, and layout datasets that were used the last time the file was saved.

Terminating the Screen

Do one of the following to terminate the Selection Criteria Error Summary screen:

- Enter the END command to terminate the editing of the selection criteria and return to the Selection Criteria - Dataset Specification screen.
- Press ENTER to proceed with editing the selection criteria despite the errors. The Selection Criteria - Menu screen is displayed.

Selection Criteria Menu

If there are no errors in the selection criteria or if there are errors and you press ENTER on the Selection Criteria Error Summary screen, the Selection Criteria - Menu screen is displayed as shown in Figure 5-3. This is the first screen displayed when you create temporary selection criteria from within the Extract function.

Figure 5-3. Selection Criteria - Menu Screen

```

File-AID for IMS ----- Selection Criteria - Menu -----
OPTION ==>

                                Data base access:

Select option by entering the option number or by entering the option name

  1 Specify SEGMENT criteria
  2 Specify FIELD criteria
  3 Specify data base RELATIONSHIP criteria
-----
Use secondary indexing ==> N
                        Index DBD ==>

Enter Selection Criteria Member Description:

SHORT DESCR ==>                                (Used on member list)
Extended     ==>
Description  ==>

Specify prompting level desired ==> N           (N = New user; E = Experienced)

The commands SEG, FLD, and REL can be used from any Selection Criteria panel
to invoke Options 1, 2, or 3 respectively

```

Data Base Access : Indicates whether primary database root segments are accessed directly or sequentially during the extract process. Refer to “Direct Access Processing” on page 5-26 for more information on database access.

Select Option : Enter one of the following options or commands:

- 1 or SEG** The Segment Criteria - Segment List screen (page 5-9) is displayed.
- 2 or FLD** The Field Criteria Set List screen (page 5-13) is displayed.
- 3 or REL** The Relationship Specification screen (page 5-30) is displayed.

Use secondary indexing : Indicate whether you want to access the primary DBD through a secondary index.

Note: The File-AID *for IMS/CICS* or File-AID *for IMS/DC* Audit Trail database does not support secondary indexing.

Index DBD : Specify the secondary index DBD name when using secondary indexing. If left blank File-AID *for IMS* displays the the Secondary Index Database List screen. Refer to “Use of Secondary Indexes” on page 5-28 for details.

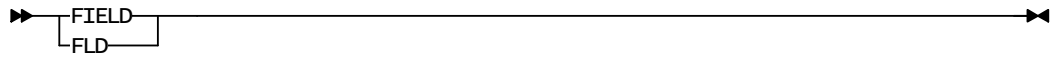
Short Descr : Enter a short 30-byte description for the selection criteria member. This description is displayed on the Member List screen for the selection criteria dataset. This field is valid only for existing selection criteria and is not displayed when editing temporary selection criteria.

Extended Description : Enter two lines (62 bytes each) of extended description for both temporary and existing selection criteria.

Specify Prompting Level Desired : Specify whether you are a new or experienced user of File-AID *for IMS*. If you specify N, the informational screens associated with the Segment Criteria and Field Criteria options are displayed. Specify E to skip the

FIELD

The FIELD command accesses the Field Criteria Set List screen (Figure 5-8 on page 5-13) from any screen within the selection criteria option.



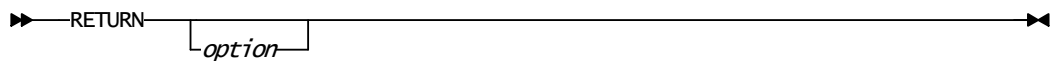
RELATIONSHIP

In selection criteria, the RELATIONSHIP command accesses the Relationship Specification screen (Figure 5-19 on page 5-30) where you can then exclude and limit selection of application and/or logically related databases.



RETURN

The RETURN command causes an immediate return to the Primary Option Menu or to the specified option. A save is automatically issued if any changes were made since the file was last saved.



SAVE

When editing a database, the SAVE command causes File-AID *for IMS* to immediately issue a DL/I checkpoint call. When editing a segment/layout XREF or a selection criteria file, SAVE causes the data to be stored back into the dataset or member.

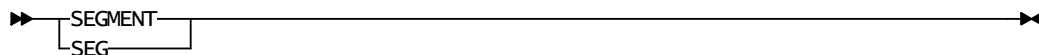
For a partitioned dataset member, the member is rewritten with the same name and the library statistics for the member are updated.

The SAVE command does not terminate the selection criteria edit session. You normally terminate selection criteria edit by entering the RETURN command. The RETURN command causes a SAVE to be issued before termination if any changes were made since the selection criteria file was last saved.



SEGMENT

The SEGMENT command accesses the Segment Criteria - Segment List screen (Figure 5-5 on page 5-9) from any screen within the selection criteria option.



Segment Criteria

Segment selection criteria are used to control selection of database segments based on occurrence counts and limits rather than field values. Segment criteria are applied to all criteria sets.

If a segment occurrence passes segment selection criteria, field criteria are applied if any exist (refer to “Field Criteria” on page 5-13). If a segment occurrence passes all selection criteria, then the relationship criteria that control selection of related database records are applied.

The informational screen shown in Figure 5-4 is displayed if you specify new user and select Option 1, Segment, on the Selection Criteria - Menu screen.

Figure 5-4. Selection Criteria - Segment List Information Screen

```

File-AID for IMS ----- Segment Criteria - Segment List Information -----
COMMAND ==>

SEGMENT CRITERIA allow you to control the selection of data base
segments based on occurrence counts and limits, rather than field
values.

If a segment occurrence passes segment criteria, then field criteria
are applied, followed by relationship criteria, if any exist.

Press ENTER to continue to the next screen

```

Segment Criteria Segment List

The Segment Criteria - Segment List screen, as shown in Figure 5-5 on page 5-9, is displayed when you select Option 1 on the Selection Criteria - Menu screen or enter the SEGMENT command on any screen within Option 6. The Segment Criteria - Segment List screen is a scrollable list of your whole DBD structure. This screen is used to select a segment where segment criteria are to be applied.

Figure 5-5. Segment Criteria - Segment List Screen

```

File-AID for IMS ----- Segment Criteria - Segment List      ROW 1 TO 5 OF 5
COMMAND ==>                                           SCROLL ==> CSR

Maximum data base segments to extract ==> 0           (0 = No limit)

Enter S to select a segment

Line  Extract
Cmd  Segment  -----Level-----  Segment-  --Description--34
-    Y        1 DBD-PORDR        ORDR010  ORDER ROOT
-    Y        2                    ORDR020  ORDER LINE
-    Y        3                    ORDR030  ORDER STATUS
-    Y        2                    ORDR040  ORDER SCRAP
-    Y        2                    ORDR050  ORDR-CUST LCHLD
-    ***      END OF SEGMENT LIST ***

```

Maximum Data Base Segments to Extract : Enter the maximum number of database segments to be selected before terminating the selection process. After the specified limit is reached, all remaining segments in the database are not selected regardless of the field selection criteria specified. If this limit is reached while extracting logically related segments, application related segments, or subordinate segments for the root, the extract process continues until all the necessary segments are extracted. If you do not want to set a limit on the number of database segments to select, enter 0 in this field.

Line Cmd : Enter the S line command to select a database segment for processing. Only one database segment at a time can be selected for processing.

Extract Segment : Enter Y if you want to extract a segment. Only the segments that you select are extracted in the selection process. There can be a conflict if you specify a value different than the value specified on the Field Criteria - Segment List screen. Refer to “Field Criteria Segment List” on page 5-16 for more information on specifying Extract Segment values in field and segment criteria.

Level : Displays the hierarchical level number of the segment in the database. For the root segment, the primary DBD name is displayed next to the level number.

Segment : Displays the segment name as specified in the DBD.

Description : Displays a 15-character segment description. This description is stored in the segment/layout cross-reference created in Option 7.

Terminating the Screen

Do one of the following to terminate the Selection Criteria - Segment List screen:

- Enter an S line command and press ENTER to proceed to the Segment Criteria screen.
- Enter the FIELD or REL command to access the corresponding Field Criteria Set List (Figure 5-10 on page 5-15) or Relationship Specification (Figure 5-19 on page 5-30) screen.
- Enter the END command to terminate the selection process and return to the Selection Criteria - Menu screen.
- Enter the CANCEL command to terminate the selection process and return to the Selection Criteria - Dataset Specification screen.
- Enter the RETURN command to return to the Primary Option Menu.

Segment Criteria Screen

The Segment Criteria screen, shown in Figure 5-6, is displayed when you select a database segment on the Segment Criteria - Segment List screen and press ENTER. This screen is used to create segment criteria for any segment in the primary database. The segment criteria data apply to all criteria sets.

Figure 5-6. Segment Criteria Screen

```

File-AID for IMS ----- Segment Criteria -----
COMMAND ==>

      Segment name: ORDR010
Current segment level: 1
      Extract segment: Y

Starting occurrence number within parent ==> 1          (Must be > 0)
      Selection interval:
          Select within parent ==> 1          (Must be > 0)
          Skip within parent   ==> 0

          Maximum segments within parent ==> 0          (0 = No limit)
Maximum segments within data base record ==> 0          (0 = No limit)
      Max segments to select within data base ==> 0      (0 = No limit)

Enter END command when segment criteria has been fully specified

```

Starting Occurrence Number within Parent : Enter the database segment occurrence where you want the selection process to begin. All segments prior to the starting database segment occurrence number are not selected, regardless of field selection criteria specified.

Selection Interval: Select within Parent : Enter the number of database segments you want selected at each selection interval. You must specify a value greater than 0 for this field. The Selection Interval: Select and Skip fields determine the segment selection pattern for the database.

Selection Interval: Skip within Parent : Enter the number of database segments you want to skip between selection intervals. All database segments skipped are not selected regardless of field selection criteria specified.

Note: The values specified in the Starting Occurrence Number within Parent and Selection Interval fields can cause File-AID for IMS to not select segment criteria that pass field selection criteria when direct access processing is performed (refer to "Direct Access Processing" on page 5-26 for more information).

Maximum Segments within Parent : Enter the maximum number of segments to be processed within a parent. If you do not want to set a limit on the number of segments to select within a parent, enter 0 in this field.

Maximum Segments within Data Base Record : Enter the maximum number of segments to be processed within the current root segment before terminating the selection process. After this limit is reached, all remaining segments are not selected regardless of the field criteria specified. If you do not want to set a limit on the number of segments to select, enter 0 in this field.

Max Segments to Select within Data Base : Enter the maximum number of segments of the specified segment type to select during the selection process. This field enables you to set an absolute limit on the number of occurrences of the specified segment type that are processed. After this limit is reached, all remaining segments of the specified segment type in the database are not selected regardless of the field criteria specified. If you do not want to set a limit on the number of database segments of the specified segment type to select, enter 0 in this field.

Terminating the Screen

Do one of the following to terminate the Segment Criteria Screen:

- Enter the FIELD or REL command to access the corresponding Field Criteria Set List (Figure 5-10 on page 5-15) or Relationship Specification screen (Figure 5-19 on page 5-30).
- Enter the END command to terminate editing of the selection criteria and return to the Segment Criteria - Segment List screen.
- Enter the RETURN command to terminate editing and return to the Primary Option Menu. If you are editing existing selection criteria in Option 6, the member is saved before the command is executed.
- Enter the CANCEL command to terminate editing of the selection criteria. If you are editing existing selection criteria in Option 6, the selection criteria member is not saved and you are returned to the Selection Criteria - Dataset Specification screen. If you are editing temporary selection criteria within the Extract function, CANCEL returns you to the previous screen in that function, and the criteria are not applied.

Figure 5-7 on page 5-12 is an example of segment selection criteria.

Figure 5-7. Example of Segment Selection Criteria

```

SEGMENT NAME: ORDR010
CURRENT SEGMENT LEVEL: 1
EXTRACT SEGMENT: Y

STARTING OCCURRENCE NUMBER WITHIN PARENT  -> 3 (Must be > 0)
SELECTION INTERVAL:
    SELECT WITHIN PARENT  -> 2 (Must be > 0)
    SKIP WITHIN PARENT   -> 1

    MAXIMUM SEGMENTS WITHIN PARENT  -> 0 (0 = No limit)
    MAXIMUM SEGMENTS WITHIN DATA BASE RECORD  -> 0 (0 = No limit)
    MAX SEGMENTS TO SELECT WITHIN DATA BASE  -> 5 (0 = No limit)

Selected/Not Selected   Segments in the Primary Data Base

NS          Root Segment      R
NS          Child Segment     C
NS
NS          R
S          Select 2           R  <-Starting Occurrence Number
S          R
S          C
NS          Skip 1           R
NS          C
NS          C
S          Select 2           R
S          C
S          R
S          C
S          C
NS          Skip 1           R
NS          C
NS          C
S          Select 2           R  <-5th Root Segment Selected
S          C  <-10th Data Base Segment
S          Selected*
S          C
S          C
S          C
NS          Not selected because  R
NS          limit has been reached C
NS          C
NS          R
NS          R

```

* Based on a value of 10 set in the Maximum Data Base Segments to Extract field on the Segment Criteria - Segment List screen.

In this example, no logically related database segments are selected.

If you enter the following values in the segment selection criteria fields for all segments on the Segment Criteria - Segment List screen, all segments in the primary database pass segment selection criteria and proceed to field criteria.

```

STARTING OCCURRENCE NUMBER WITHIN PARENT  -> 1 (Must be > 0)
      SELECTION INTERVAL:
          SELECT WITHIN PARENT  -> 1 (Must be > 0)
          SKIP WITHIN PARENT    -> 0

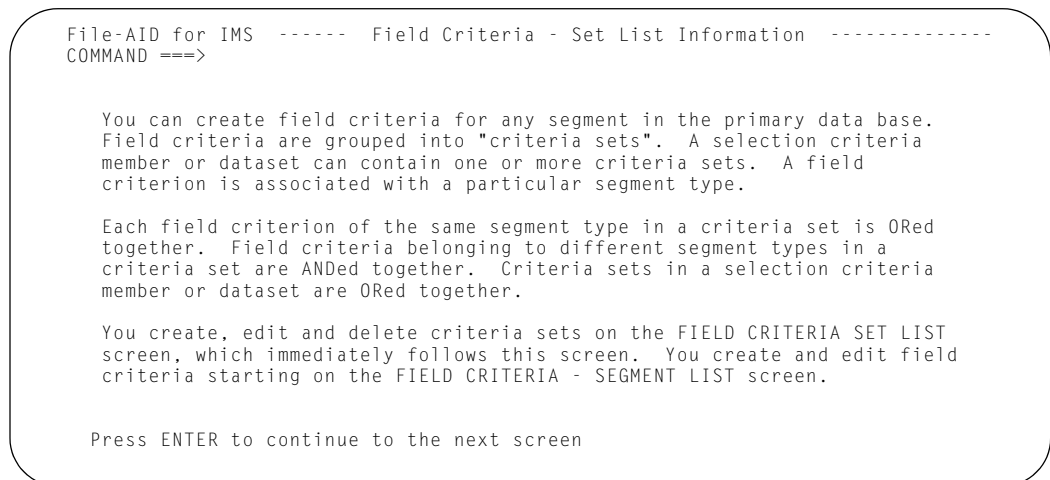
          MAXIMUM SEGMENTS WITHIN PARENT -> 0 (0 = No limit)
MAXIMUM SEGMENTS WITHIN DATA BASE RECORD -> 0 (0 = No limit)
MAX SEGMENTS TO SELECT WITHIN DATA BASE -> 0 (0 = No limit)

```

Field Criteria

The Field Criteria - Set List Information screen, shown in Figure 5-8 on page 5-13, is displayed when you specify New User and select Option 2, Field Criteria, on the Selection Criteria - Menu screen.

Figure 5-8. Field Criteria - Set List Information Screen

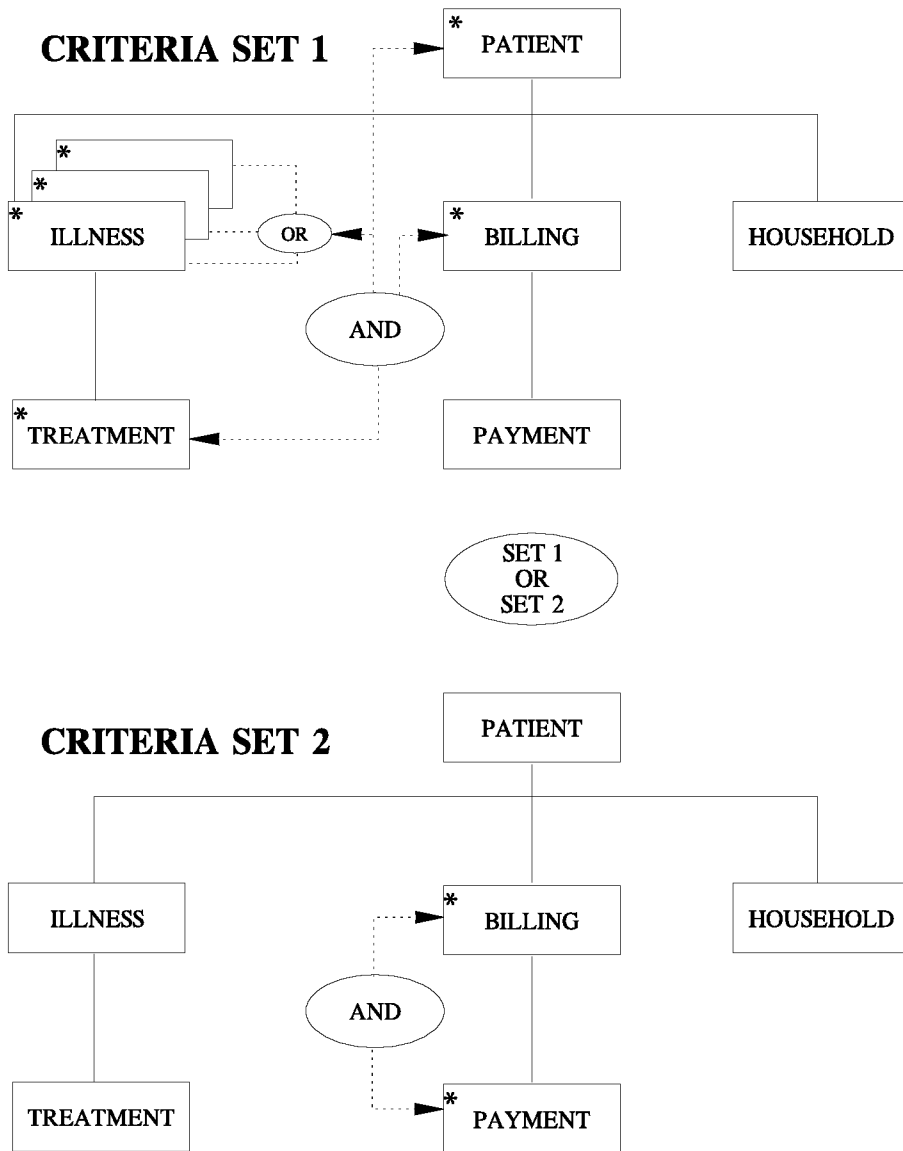


The database illustrated in Figure 5-9 on page 5-14 has six segment types. An asterisk in the box indicates a field criteria record.

In criteria set 1, field criteria exist for all segments except PAYMENT and HOUSEHOLD. Three field criteria records exist for the ILLNESS segment.

In criteria set 2, there is one field criteria record for the BILLING segment and another for the PAYMENT segment.

Figure 5-9. Criteria Sets and Criteria Records



Field Criteria Set List

The Field Criteria Set List screen, shown in Figure 5-10 on page 5-15, is displayed when you select Option 2 or enter the FIELD command on the Selection Criteria - Menu screen.

Figure 5-10. Field Criteria Set List Screen

```

File-AID for IMS ----- Field Criteria Set List ----- ROW 1 TO 2 OF 2
COMMAND ==>                                           SCROLL ==> CSR

Data base: PORDR

To create Field Criteria, select a line and enter the optional description
Enter S, I, D, or R to select, insert, delete or repeat a criteria set

Line Criteria
Cmd  Set  -----Criteria Set Description----- Data base
----- 1  FIND ALL COMPLETED ORDERS - FORMATTED      Access
----- 2  FIND ALL OUTSTANDING ORDERS - UNFORMATTED
*** END OF CRITERIA SET LIST ***

```

Line Cmd : Enter one of the following:

- D** Deletes a criteria set
- I** Inserts a line to create a new criteria set
- R** Repeats a criteria set
- S** Selects a criteria set for editing.

A repetition factor of 1—9 is allowed for the D, I, and R line commands.

Criteria Set : Displays the number that File-AID *for IMS* assigned to each selection criteria set that you created. This criteria set number is used for identification purposes only during the selection criteria process and acts like a line number during an ISPF edit session. As criteria sets are added and/or deleted, the criteria set numbers are reassigned in ascending order.

Criteria Set Description : Enter a 50-byte description for each criteria set.

Data Base Access : Displays whether database access to the root segments is direct or sequential. Refer to “Direct Access Processing” on page 5-26 for more information.

Terminating the Screen

Do one of the following to terminate the Field Criteria Set List screen:

- Select a set and press ENTER to proceed to the Field Criteria - Segment List screen (Figure 5-5 on page 5-9).
- Enter the END command to return to the Selection Criteria - Menu screen.
- Enter the RETURN command to return to the Primary Option Menu.

Field Criteria Segment List

The Field Criteria - Segment List screen, shown in Figure 5-11, is displayed when you select a criteria set and press ENTER on the Field Criteria Set List screen. The Field Criteria - Segment List screen is a scrollable list that functions like any other segment list screen.

This screen enables you to select and/or extract segments for field criteria. For each segment type within a set, you can create a maximum of 500 field selection criteria. However, there is no limit to the number of sets you can create.

Figure 5-11. Field Criteria - Segment List Screen

```

File-AID for IMS ----- Field Criteria - Segment List      ROW 1 TO 5 OF 5
COMMAND ==>                               SCROLL ==> CSR
Criteria set: 1                               Set data base access:

Enter an S line command to select a segment for field criteria
In EXTRACT SEGMENT, enter Y to extract segments that pass criteria, or
    N to not extract segments even if they pass criteria, or
    T to extract the twins of the segment passing criteria
Enter A in EXTRACT CHILDREN to extract all children of passing segments
Field criteria on the same seg type are ORed; on different seg types are ANded

Max data base records to extract for this set ==> 0          (0 = No limit)
Line Extract Extract                                     FMT UNFMT
Cmd Segment Children -----Level----- Segment- --Description-- -Criteria-
-      Y      -      1 DBD-PORDR      ORDR010  ORDER ROOT      0      0
-      Y      -      2              ORDR020  ORDER LINE      0      0
-      Y      -      3              ORDR030  ORDER STATUS    0      0
-      Y      -      2              ORDR040  ORDER SCRAP     0      0
-      Y      -      2              ORDR050  ORDR-CUST LCHLD 0      0
                                     *** END OF SEGMENT LIST ***
    
```

Set Data Base Access : Displays whether database access to the root segments is direct or sequential. Refer to “Direct Access Processing” on page 5-26 for more information.

Max Data Base Records to Extract for This Set : Enter a number to limit the number of database records selected for extraction in this criteria set. When the specified limit is reached, the criteria set is disabled for the remainder of the extract process.

Line Cmd : Enter S to select the segment type that you want to create or edit selection criteria for.

Extract Segment : Indicate which segments you want extracted after selection criteria are applied.

- Y** Extracts the segment occurrence if it passes selection criteria. This value is the default.
- N** Does not extract this segment, even if it passes selection criteria.
- T** Extracts segment occurrence if it passes selection criteria; includes all twins.

The Extract Segment field on the Segment Criteria - Segment List screen applies to all criteria sets. However, the Extract Segment field on this screen applies only to segment occurrences passing this criteria set. If a conflict exists between the two fields, an asterisk is displayed next to the field criteria Extract Segment value.

When you specify segment and field criteria, the value you specify in the Extract Segment field is important. A conflict can occur between the Extract Segment value on the Segment Criteria - Segment List screen and the Field Criteria - Segment List screen. Use the following matrix to identify valid combinations:

<u>Field Criteria</u>	<u>Segment Criteria</u>	<u>Result</u>
Y or T	Y	Valid
Y or T	N	Invalid
N	Y	Valid
N	N	Valid

If you specify Y or T as the Extract Segment value in Field Criteria and then specify N in Segment Criteria, a message informing you of the conflict is displayed, however, no error occurs. The Segment Criteria's indicator takes precedence over any set's Field Criteria indicator.

Extract Children : Enter A if you want to extract all children of the current segment. The Extract Segment values for all dependent segments that are N are set to Y.

Note: The Extract Segment and Extract Children fields allow flexible extracts. It is important to note that selection criteria are not applied to the additional segment occurrences that may be extracted due to the values specified in the Extract Segment and Extract Children fields.

Level : Displays the hierarchical level number of the segment in the database. For the root segment, the primary DBD name is displayed next to the level number.

Segment : Displays the segment name as specified in the DBD.

Description : Displays a 15-character segment description.

FMT and UNFMT Criteria : Displays the number of existing formatted and/or unformatted field criteria for each segment. These fields are protected.

Terminating the Screen

Do one of the following to terminate the Field Criteria - Segment List screen:

- Press ENTER to proceed to the Field Criteria List screen.
- Enter the END command to return to the Field Criteria Set List screen.
- Enter the RETURN command to return to the Primary Option Menu.

Field Criteria List

The Field Criteria List screen, shown in Figure 5-12 on page 5-17, is displayed when you select a segment on the Field Criteria - Segment List screen and press ENTER. This screen is a scrollable list of existing field criteria that displays a line for each existing field criteria defined for the selected segment type in the criteria set.

Figure 5-12. Field Criteria List Screen

```

File-AID for IMS ----- Field Criteria List ----- ROW 1 TO 3 OF 3
COMMAND ===>                                     SCROLL ===> CSR

Criteria set: 1
Segment name: ORDR010

To create Field Criteria, select a line and enter the FORMATTED indicator (Y/N)
and the optional description
Enter S, I, D, or R to select, insert, delete, or repeat Field Criteria
The relationship between each field criterion is ORed

Line  Criteria                                     Data base
Cmd   Number  Formatted  ---Condition Description---  Access
---   ---     ---        ---
---   1       -         TYPE 1 CABLE
---   2       -         TYPE 2 CABLE
---   3       -         TYPE 3 CABLE
***   END OF FIELD CRITERIA LIST   ***

```

Line Cmd : Enter one of the following:

- D** Deletes a field criteria
- I** Inserts a field criteria
- R** Repeats a field criteria
- S** Selects a field criteria for editing.

A repetition factor of 1—9 is allowed for the D, I, and R line commands.

Criteria Number : Displays the number that File-AID *for IMS* assigned to each field criteria. This number is used only for identification purposes during the selection criteria process and acts like a line number during an ISPF edit session. As field criteria are added and/or deleted, the numbers are reassigned in ascending order. The field criteria number does not affect the selection process in any way.

Formatted : When you insert a field criteria, you must specify the criteria type in this field. You cannot change the Formatted value for an existing field criteria. Enter the criteria record type.

- Y** Formatted field criteria
- N** Unformatted field criteria

Condition Description : Displays a 30-byte field criteria description.

Data Base Access : Displays whether database access to the root segments is direct or sequential. Refer to “Direct Access Processing” on page 5-26 for more information.

Terminating the Screen

Do one of the following to terminate the Field Criteria List screen:

- Press ENTER to proceed. Depending on the segment type and whether formatted or unformatted was specified, one of the following screens is displayed:
 - If you are creating new field criteria for a segment that requires more than one layout and specified Y in the Formatted field, the Select Multiple Record Type Value screen (Figure 5-13 on page 5-19) is displayed.
 - If you are creating new field criteria with a single segment layout and specified Y in the Formatted field, the Formatted Field Criteria screen (Figure 5-15 on page 5-21) is displayed.
 - If you are editing existing field criteria and the Formatted field value is Y, the Formatted Field Criteria screen (Figure 5-15 on page 5-21) is displayed.
 - If you are creating/editing new/existing field criteria and specified N in the Formatted field, the Unformatted Field Criteria screen (Figure 5-16 on page 5-24) is displayed.
- Enter the END command to return to the Field Criteria - Segment List screen.
- Enter the RETURN command to return to the Primary Option Menu.

Select Record Type Value

The Select Record Type Value screen, shown in Figure 5-13, is displayed when a newly created formatted field criterion is selected on the Field Criteria List screen and the current segment is defined as a multiple record type segment.

The Select Record Type Value screen is used when the segment you selected has multiple formats that require more than one segment layout to define them. For this type of segment, there are up to two fields within the segment that contain values indicating the segment format. In File-AID *for IMS*, these values are called record type values. One or two record type values can be used to identify a field criterion.

Figure 5-13. Select Record Type Value Screen

```

File-AID for IMS ----- Select Record Type Value ----- ROW 1 TO 6 OF 6
COMMAND ==>                                           SCROLL ==> CSR

  Data base: PORDR
Segment name: ORDR020

Enter S to select segment record type

Line
Cmd --Record Type 1-- --Record Type 2-- --Member-- -----Starting Data-Name-----
-   PO                                     ORDR020
-   SC                                     ORDR021
-   WO             IN                       ORDR022     INTERNAL-WORK-ORDER
-                   OV                       ORDR022     OUTSIDE-VENDOR-WORK-ORDER
-                   *OTHER*
-   *OTHER*
                                     ***  END OF RECORD TYPE LIST  ***

```

Line Cmd : Enter the S line command to select the segment record type.

Record Type 1 : Displays the following types of entries:

- The specific values that can appear in the Record Type 1 field.
- The literal *OTHER* if multiple record type 1 values are associated with one segment layout or have the same Record Type 2 field. The literal *OTHER* may appear as the last record type 1 value without a segment layout member. This entry is for your convenience only and can be ignored if not needed.

Record Type 2 : Displays the following types of entries:

- The specific values that can appear in the Record Type 2 field.
- The literal *OTHER* if multiple record type 2 values are associated with one segment layout. Refer to the Record Type 1 section described above for more information.

Member : Displays the source library member where the segment layout corresponding to the record type 1 and 2 combination is stored.

Starting Data-Name : Displays the starting data-name of the segment layout.

Terminating the Screen

Do one of the following to terminate the Select Record Type Value screen:

- Enter an S line command and press ENTER to proceed. Depending on what you selected on this screen, one of the following screens is displayed:
 - If you selected a record type value, the Formatted Field Criteria screen (Figure 5-15 on page 5-21) is displayed.
 - If you selected *OTHER*, the Other Record Type Value Specification screen (Figure 5-14 on page 5-20) is displayed.
- Enter the END command to return to the Field Criteria List screen.

Other Record Type Value Specification Screen

The Other Record Type Value Specification screen is displayed when you select the literal *OTHER* on the Select Record Type Value screen.

Figure 5-14. Other Record Type Value Specification Screen

```

File-AID for IMS ----- Other Record Type Value Specification -----
COMMAND ==>

      Data base: PORDR
      Segment name: ORDR020

      COBOL member: ORDR022
      Starting data-name:

Specify record type value(s):
Record type 1 ==> W0          Length: 2
              2 ==>          Length: 2

```

Starting Data-Name : Displays the starting data-name.

Record Type 1 and Record Type 2 : Enter record type values 1 and 2 for the *OTHER* values. If values are already defined, this field is protected.

Terminating the Screen

Do one of the following to terminate the Other Record Type Value Specification screen:

- Press ENTER. If you changed the fields or used any primary commands on this screen, the screen is refreshed to give you a chance to verify your changes. If no changes were made, the Formatted Field Criteria screen (Figure 5-15 on page 5-21) is displayed.
- Enter the END command to return to the Select Multiple Record Type Value screen.

Multiple Record Type Value Primary Commands

In addition to “Common Primary Commands” on page 5-7, the following primary commands can be used on the Select Multiple Record Type Value and the Other Record Type Value Specification screens:

CAPS	Controls whether alphabetic data entered is automatically translated to upper case or left as-is.
DBCS	Changes display format to DBCS.
EBCDIC	Changes display format to EBCDIC.
HEX	Displays data in either hexadecimal or character format. The first line is in character format. The next two lines are in HEX format.
MIXED	Changes display format to mixed DBCS and EBCDIC.

Appendix A, “Command Summary” provides the syntax for each of these commands.

Formatted Criteria Screen

The Formatted Criteria screen is displayed when you do one of the following:

- Select a formatted field criteria entry for a segment with a single segment layout on the Field Criteria List screen.
- Select an entry on the Select Multiple Record Type Segment screen.

The Formatted Selection Criteria screen, shown in Figure 5-15 on page 5-21, is used to control the selection of database segments based on field values specified using a segment layout. Each field criterion within a selection criteria is ANDed together. However, each field criterion is ORed together. Field selection criteria are then applied to segments that pass the segment selection criteria you specify.

Figure 5-15. Formatted Criteria Screen

```

File-AID for IMS ----- Formatted Criteria ----- LINE 00001
COMMAND ===>                                     SCROLL ===> CSR
Seg  ORDR010  ORDER ROOT                               Data base access: SEQUENTIAL
Criteria no. 1
-----Level number/Data-name----- -Format- RO -----Field Value-----
01  ORDER-ROOT-DATA
    05  ORDER-ROOT-KEY
        07  ORDER-NUMBER-PREFIX           C  2  K >  AA
        07  ORDER-NUMBER                 Z  4  K
    05  ORDER-DESCRIPTION                 C 40
        (POS 31-40)
    05  CUSTOMER-NUMBER                   C  6      =  CN0001
    05  PLANNED-ORDER-QUANTITY            PS  5
    05  PLANNED-ORDER-AMOUNT              P  5  2
    05  ORDER-TYPE                        C  2
    05  ACTUAL-ORDER-QUANTITY              PS  5
    05  TOTAL-SCRAP-QUANTITY              PS  5
    05  TOTAL-SCRAP-REDEFINES             RDEFINES  TOTAL-SCRAP-QUANTITY
        C  3
    05  ORDER-STATUS                      Z  2
    05  FILLER                            C  1

Enter END command to return to field criteria list

```

Data Base Access : Indicates whether primary database root segments are accessed directly or sequentially during the extract process. Refer to “Direct Access Processing” on page 5-26 for more information.

Level Number/Data-Name : Displays the level number and data-name of each item in the segment layout.

RO : Enter the relational operator and field value next to each field that you want to base the selection on. Leave the relational operator and the field value blank for fields not involved in the selection criterion. The RO field is protected for non-elementary items.

Multiple fields on a single criterion are logically ANDed together. Multiple sets of criteria are logically ORed together.

Fields that contain the record type are protected in the segment layout, and the intensified message "RECORD TYPE FIELD" is displayed in the Field Value field. The record type fields are treated as if you entered the EQ relational operator and the corresponding record type values. Following are the valid relational operators:

= or EQ	Equal to
≠ or NE	Not equal to
> or GT	Greater than
< or LT	Less than
>= or GE	Greater than or equal to
<= or LE	Less than or equal to
BT	Within a range of two values (endpoints inclusive)
NB	Outside a range of two values (endpoints exclusive)
CO	Search within a field for a character string
NC	Search within a field for absence of a character string

The BT relational operator includes the endpoints of the range you specify. The NB relational operator does not include the endpoints. The BT and NB relational operators are not valid for Double-Byte Character Set (DBCS) support.

The CO and NC relational operators can be specified only for alphanumeric fields (PIC X for COBOL, CHAR or PIC for PL/I).

PL/I EQ and NE are the only valid relational operators for bit items.

Extract based on key values : EQ is the only valid relational operator for key values.

Field Value : For fields with relational operators other than BT and NB, you specify the field value to be used in the comparison exactly as in Edit Formatted. You can enter the words HIGH-VALUES and LOW-VALUES for alphanumeric fields to represent a value of HEX FFs or HEX 00s, respectively. If you want to compare an alphanumeric field to blanks (HEX 40s) simply leave the Field Value field blank.

COBOL	For Index fields, you must enter the field value as a four-byte hexadecimal string (for example, X'41414141').
PL/I	For Pointer and Fullword Floating Binary fields, you must enter the field value as a four-byte hexadecimal string (for example, X'41414141'). For Doubleword Floating Binary fields, you must enter an eight-byte hexadecimal string (for example, X'4141414141414141').
	Formatted field criteria values can only be specified for bit items that are eight bits or less in length. The field value can contain only zeros and/or ones. The field value you specify is treated as a mask that is ANDed with the bit item when the field criteria are applied. For example, where EQ 00100010 is specified for a BIT(8) field any segment that contains a 1 bit in positions 2 and/or 6 (where the leftmost bit is position 0 and the rightmost bit is position 7) is selected. The bit values in the other positions are ignored.
	Conversely, where NE 00100010 is specified any segment that contains a 0 bit in both positions 2 and 6 is selected, regardless of the values in the other positions.

You can select segments with an invalid field value by entering the word INVALID with the EQ relational operator. You can select segments with a valid field value by entering the word INVALID with the NE relational operator. You can use the word INVALID for alphanumeric, binary, packed decimal, and zoned decimal fields only. For numeric fields, any value that does not conform to the field's data type is invalid. For alphanumeric fields, any value that contains non-displayable data is invalid.

For relational operators BT and NB, enter two values separated by a semicolon (for example, BT 0.00;9.99). In most cases you have sufficient space to enter the two values.

Relational operators CO and NC can be used to scan a field within each segment for the presence or absence of a particular character string. The string to be searched is entered in the Field Value field. Trailing blanks within the field value are ignored and are not included in the search string. To search for mixed case or lower case text, enter CAPS OFF before specifying the criteria. Only text exactly matching the upper/lower case spelling is found (for example, SMITH and Smith are different strings).

Note: COBOL Index fields and PL/I Pointer and Floating Binary fields are the only field types for which you can enter hexadecimal strings in the Field Value field.

Extract with Keys from Input File

A key file may also be used for any extract processing including secondary indexing.

Note: The File-AID *for IMS/CICS* or File-AID *for IMS/DC* Audit Trail database does not support secondary indexing.

When the extract is based on key values read from an input file and either the data in the dataset is not in the default format or you want to supply additional selection criteria,

you must specify the location, length, and type of data to be used for the key values. Specify this information in the field value as follows:

```
INPUT(s, l, t)
```

- s* The starting position within the logical record of the dataset. This position is relative to 1.
- l* The length of the data in the logical record of the dataset.
- t* The type of the data in the logical record of the dataset.
 - C** Character data
 - X** Hexadecimal display (two characters for each byte) data
 - Z** Internal format data (EBCDIC)

This format of the field value is valid for the the secondary index keys and keys of the FROM database root segment. If entered on another field, the value is treated as a literal.

At execution time, the data is read from the input dataset and converted to the format associated with that field. The use of formatted field selection criteria allows you to specify which parts of the logical record comprise the key value and how the data is to be converted. For formatted selection criteria using character conversion type C, the data format contained in the layout determines what kind of data conversion occurs at execution time.

If the layout indicates that the field is numeric, standard numeric data conversion of display data is used to convert the input value to a value matching the internal format specified in the layout. For example, leading blanks will be replaced by zeros and zoned decimal values will be converted to zoned, packed or binary depending on the specification in the layout.

Examples of Input Statements

Scenario 1

You have a database with the key field being defined as length 4, and unsigned numeric, equivalent to COBOL PIC 9(4). You also have a corresponding database root segment with a value of 22. The relevant INPUT statements and corresponding key file values (starting in column 10) would be:

Statement	Key file value
INPUT(10,4,C)	0022 (or two blanks followed by 22)
INPUT(10,8,X)	F0F0F2F2
INPUT(10,4,Z)	0022

Note: The C format example will be the same, no matter what the database field format is.

Scenario 2

Scenario 2 is similar to Scenario 1, with the difference being that the database key field is defined as length 4 packed signed numeric, equivalent to COBOL PIC S9(7) COMP-3. The relevant X & Z INPUT statements and corresponding key file values would be (with the Z values shown in Hex format):

Statement	Key file value
INPUT(10,8,X)	000022C
INPUT(10,4,Z)	0002 002C

For all relational operators except CO and NC, when length exceeds the actual length of the entered field value, blanks are padded to the right of the field value. If the Length field is left blank, the default length is the actual length of the specified field value.

For the CO and NC relational operators, the Length field determines the portion of each segment that is searched for the field value. Trailing blanks within the field value are ignored and are not included in the search string. If the Length field is left blank, each segment is searched from the start position through the end of the segment.

REL OP : Enter the relational operators in this field. Following are the valid values:

= or EQ	Equal to
≠ or NE	Not equal to
> or GT	Greater than
< or LT	Less than
≥ or GE	Greater than or equal to
≤ or LE	Less than or equal to
BT	Within a range of two values (endpoints inclusive)
NB	Outside a range of two values (endpoints exclusive)
CO	Search within a field for a character string
NC	Search within a field for absence of a character string

The BT relational operator includes the endpoints of the range you specify. The NB relational operator does not include the endpoints. The BT and NB relational operators are not valid for Double-Byte Character Set (DBCS) support.

The only valid relational operator for key values is EQ.

Field Value : For fields with relational operators other than BT and NB, enter either a character string or a hexadecimal string. Hexadecimal strings are entered in the format Xnnn... or X'nnn...'. For relational operators BT and NB, enter two values separated by a semicolon. The values can be HEX strings, character strings, or both. For example, the following strings are equivalent:

```
XF1 3      or
X'F1';XF3  or
1;3
```

If you want to compare a field to blanks (HEX40's), simply leave the Field Value field blank and enter the desired number of blanks for comparison in the Length field.

Extract with Keys from Input File

When the extract is based on key values read from an input file and either the data in the dataset is not in the default format or you want to supply additional selection criteria, you must specify the location, length, and type of data to be used for the key values. Specify this information in the field value as follows:

```
INPUT(s, l, t)
```

- s** The starting position within the logical record of the dataset. This position is relative to 1.
- l** The length of the data in the logical record of the dataset.
- t** The type of the data in the logical record of the dataset.
 - C** Character data.
 - X** Hexadecimal display (two characters for each byte) data
 - Z** Internal format data

This format of the field value is valid for the keys of the FROM database root segment and secondary index keys when using secondary index processing. If entered on another field, the value is treated as a literal.

Formatted/Unformatted Field Criteria Primary Commands

In addition to the “Common Primary Commands” on page 5-7, the following primary commands can be used on the Formatted and Unformatted Field Criteria screens:

CAPS	Controls whether alphabetic data entered is automatically translated to upper case or left as-is.
EXCLUDE	Unprotects/protects the left side of the screen, which enables you to enter the X line command to exclude lines (Formatted Field Criteria only).
RESET	Redisplays previously excluded lines (Formatted Field Criteria only).
DBCS	Changes display format to DBCS.
EBCDIC	Changes display format to EBCDIC.
MIXED	Changes display format to mixed DBCS and EBCDIC.

Appendix A, “Command Summary” provides the syntax for each of these commands.

Direct Access Processing

Based on unformatted and formatted field selection criteria, there are three ways that File-AID *for IMS/CICS* or File-AID *for IMS/DC* can access primary database root segments during extract processing. Direct access to root segments is performed using qualified GU (Get Unique) DL/I calls. Sequential access is performed using unqualified GN (Get Next) DL/I calls. Direct access using a Secondary Index.

The requirements for direct or sequential database access vary according to the DL/I access methods. File-AID *for IMS/CICS* or File-AID *for IMS/DC* group DL/I access methods into the following categories to determine a direct access call:

- HIDAM, HISAM, SHISAM, and MSDB
- HDAM and DEDB
- HSAM and SHSAM

Refer to “Use of Secondary Indexes” on page 5-28 for Secondary Index details.

HIDAM, HISAM, SHISAM, and MSDB

One of the following relational operators must be specified for the first position (byte) of the root segment key or first Secondary Index field: BT, EQ, GE, GT, LE, or LT. Figure 5-17 is an example of formatted field selection criteria with partial key qualification.

Figure 5-17. Formatted Criteria Screen

```

File-AID for IMS ----- Formatted Criteria ----- LINE 00001
COMMAND ==>                                     SCROLL ==> CSR
Seg  ORDRO10  ORDER ROOT                          Data base access: DIRECT
Criteria no. 1
-----Level number/Data-name----- -Format- RO -----Field Value-----
01  ORDER-ROOT-KEY
05  ORDER-ROOT-KEY
07  ORDER-NUMBER-PREFIX      C  2  K >  AA
07  ORDER-NUMBER            Z  4  K
05  ORDER-DESCRIPTION       C 40
    (POS 31-40)
05  CUSTOMER-NUMBER         C  6  =  CN0001
05  PLANNED-ORDER-QUANTITY  PS  5
05  PLANNED-ORDER-AMOUNT    P  5  2
05  ORDER-TYPE              C  2
05  ACTUAL-ORDER-QUANTITY   PS  5
05  TOTAL-SCRAP-QUANTITY    PS  5
05  TOTAL-SCRAP-REDEFINES   RDEFINES  TOTAL-SCRAP-QUANTITY
                                C  3
05  ORDER-STATUS            Z  2
05  FILLER                  C  1

Enter END command to return to field criteria list

```

Data Base Access : Indicates direct or sequential access. This field value is based on the segment key entries. The key fields and secondary index fields are noted by a K or S in the last position of the Format column. There are two possible methods of direct access depending on how the key is qualified:

Whole key specified. : If all positions of the key are specified with an EQ relational operator, then a fully qualified GU call is used to access the root segment directly.

Partial key specified. : If the relational operator BT, GE, GT, LE or LT is specified or not all positions of the key are qualified, the first call is a fully qualified GU call to establish a starting point within the primary database. The remainder of the root calls are sequential GN DL/I calls until the end of the database or the end of a specific range is reached.

Access to the database is sequential using GN DL/I calls in the following situations:

- Key value is not specified.
- Key value is not specified for the first position of the key.
- CO, NB, NC, or NE relational operators are specified for the first position of the key.

Note: If editing the unformatted/formatted selection criteria causes the data base access to change, an informational message displays the current data base access status.

HDAM and DEDB

All positions of the root segment key must be specified with a relational operator of EQ. Figure 5-18 is an example of unformatted field selection criteria with full key qualification.

Figure 5-18. Unformatted Criteria Screen - Full Key Qualification

```

File-AID for IMS ----- Unformatted Criteria -- DATA BASE ACCESS CHANGED
COMMAND ===>                                     SCROLL ===> CSR
I207 WHEN THIS SEL CRIT MEMBER IS APPLIED, DATA BASE ACCESS WILL BE DIRECT
  Criteria set: 1
  Segment name: ORDR010                               Data base access: DIRECT
  Criteria number: 1

Enter unformatted field criteria below:
Start Pos   Length   REL OP   -----Field Value-----
   1         6       =       AA2222
  47         6       =       CN0001

-----
-----
-----
-----
-----
-----
-----
-----
-----
-----
-----

Enter END command to return to field criteria list
    
```

Data Base Access : Indicates direct or sequential access. This field value is based on the segment key entries.

If field selection criteria using the EQ relational operator is not specified for all positions of the root key, access to the database is sequential using GN DL/I calls.

Note: If editing the unformatted/formatted selection criteria causes the data base access to change, an informational message displays the current data base access status.

HSAM and SHSAM

Access to the root segments for these databases is always sequential whether or not field selection criteria are specified.

Use of Secondary Indexes

Note: The File-AID *for IMS/CICS* or File-AID *for IMS/DC* Audit Trail database does not support secondary indexing.

If the primary DBD used to drive a File-AID *for IMS* extract has a secondary index, it may be possible to use the secondary index to drive extract processing. In many cases, use of an index can improve extract performance. This is particularly true when using key file processing with an input file containing secondary index key values. Extracts using a key file process using DIRECT rather than SEQUENTIAL database access.

In many cases you may find that applying selection criteria to secondary index key fields will change processing from SEQUENTIAL to DIRECT. When this happens, the secondary index is used to drive extract processing in the same way a primary index is used. In order for this to take effect, the start of the DBD XDFLD must be referenced when specifying selection criteria. The next screen provides an example of what is required for access to be DIRECT when using selection criteria.

Using Selection Criteria on a Secondary Index Field

Suppose the PORDR DBD source contains the following statements:

```

SEGM  NAME=ORDR020,BYTES=25,PTR=T,PARENT=((ORDR010,SNGL))
FIELD  NAME=LINENUM,BYTES=2,START=1,TYPE=C
FIELD  NAME=ORDERKEY,BYTES=18,START=3,TYPE=C
FIELD  NAME=PARTKEY,BYTES=15,START=21,TYPE=C
XDFLD  NAME=SECINDX,SRCH=(PARTKEY,ORDERKEY,LINENUM)

```

Suppose the layout associated with segment ORDR020 is defined as:

```

01  ORDER-LINE-DATA-PO.
    05  LINE-NUMBER          PIC  X(02).
    05  PO-CODE              PIC  X(04).
    05  PO-NUMBER           PIC  X(14).
    05  PART-TYPE           PIC  X(05).
    05  PART-NUMBER         PIC  X(10).

```

DBD field PARTKEY spans PART-TYPE and PART-NUMBER. If selection criteria is specified for PART-NUMBER only, database access will be SEQUENTIAL. If selection criteria are specified for PART-TYPE and any other field in the layout, database access for this set of criteria will be DIRECT.

The same consideration applies to unformatted criteria. As long the first unformatted criteria entered starts at an offset that coincides with the start of the PARTKEY field on the ORDR020 segment, database access will be DIRECT. Otherwise it will be SEQUENTIAL.

If additional sets of selection criteria are defined, they must also qualify for DIRECT database access in order for the extract to execute using DIRECT database access.

Relationship Criteria

If a segment occurrence passes segment selection criteria, field criteria are applied, if any exist (refer to "Segment Criteria" on page 5-9 and "Field Criteria" on page 5-13). If a segment occurrence passes all selection criteria, then the relationship criteria that control the selection of related database records are applied.

Relationship criteria enable you to control the selection of IMS logical and application related database records. For every logical child and/or source segment in an application relationship selected, File-AID *for IMS* goes to the root of the destination parent and/or the target root to select the root and all subordinate segments. This process is called chasing relationships. If the related database record also has a logical and/or application relationship, then the process of chasing relationships repeats itself until all relationships are resolved.

Relationship Specification

The Relationship Specification screen, as shown in Figure 5-19, is displayed when you select Option 3 on the Selection Criteria - Menu screen or enter the RELATIONSHIP command on any of the screens within Option 6.

Figure 5-19. Relationship Specification Screen

```

File-AID for IMS ----- Relationship Specification -----
COMMAND ==>

Select related data base records ==> Y   (N = Exclude all related data bases
                                           Y = Selectively exclude data base
                                           relationships)

Enter N to exclude all related data bases from the selection process and return
to the Selection Criteria - Menu screen

Enter Y to proceed to the RELATIONSHIP CRITERIA screen where you can exclude
one or more related data bases from the selection process and/or limit the
number of related data base records accessed during the selection process

```

Select Related Data Base Records : Enter Y if you want to selectively exclude database relationships. Y is the default entry. If you want to exclude all relationships, enter N.

Terminating the Screen

Do one of the following to terminate the Relationship Specification screen:

- Enter Y and press ENTER. The Relationship Criteria screen (Figure 5-20 on page 5-31) is displayed. Enter N and press ENTER to display the Selection Criteria - Menu screen.
- Enter the FIELD or SEGMENT command to access the corresponding Field Criteria Set List (Figure 5-10 on page 5-15) or Segment Criteria - Segment List screen (Figure 5-5 on page 5-9).
- Enter the END command to return to the Selection Criteria - Menu screen.
- Enter the RETURN command to terminate the edit session and return to the Primary Option Menu.
- Enter the CANCEL command to terminate the edit session and return to the Selection Criteria - Dataset Specification screen.

Relationship Criteria

The Relationship Criteria screen, shown in Figure 5-20, is displayed when you specify Y in the Select related data base records field on the Relationship Specification screen. The Relationship Criteria screen is used to exclude and limit the selection of logically related databases and, if applied, application related databases in your selection criteria.

The message "*** END OF RELATIONS ***" is displayed after the last relationship on the Relationship Criteria screen.

Figure 5-20. Relationship Criteria Screen

```

File-AID for IMS ----- Relationship Criteria ----- LINE 00001
COMMAND ===>                                     SCROLL ===> CSR

Default max relationship occurrences to chase ===> 0      (0 = No limit)

Line      Source      Source      Related
Cmd       --DBD---  -Segment  ---DBD---  -----Comment-----  Occurrences
-         PORDR                    ORDR050  PCUST      LOGICAL- BI-DIR REL      ---
-         PCUST                    VORDR050 PORDR      LOGICAL- BI-DIR REL      ---
-         ***  E N D  O F  R E L A T I O N S  ***

Enter X to exclude a link to a target data base or
Use Occurrences to Chase field to limit relations crossed to IMS/APPL REL DB
Enter END command when relationships have been fully specified34

```

Default Max Relationship Occurrences to Chase : Enter a maximum number of relationship occurrences to chase. You can specify a value from 0 to 99,999,999, where 0 sets no limit on the number of relationship occurrences to chase. This value is used when an entry is not given in the Occurrences to Chase field for a logical or application relationship.

Line Cmd : Enter X to exclude a link to a target database in the selection criteria. Only the X line command is allowed.

Source DBD : This is a protected and non-modifiable field that displays the source DBD name for the target or related DBD. The target DBD is the DBD pointed to by either an IMS logical child segment or a source segment in an application relationship. The first source DBD name is the primary DBD the selection criteria are based on. Each following source DBD name was identified by File-AID *for IMS* as a DBD needed to resolve a previously identified source DBD's IMS logical relationship or application relationship.

Source Segment : This is a protected and non-modifiable field that displays the segment name in the source DBD that points to the target DBD. This segment points to the target DBD when it is an IMS logical child segment or a segment that contains the keys for the root of the target database.

Related DBD : This is a protected and non-modifiable field that displays the DBD name for the target database defined in an application relationship or IMS logical relationship.

Comment : This is a protected and non-modifiable field that displays generated comments on the type of relationship between the source segment and its related DBD. Types of relationships identified are logical unidirectional relationships, logical bidirectional relationships, and application relationships.

Occurrences To Chase : Enter the number of application or logical relationships to be chased, per source segment, in each database record. This value takes precedence over the value for the Default Max Relationship Occurrences to Chase field, unless an entry is not made. If no entry is made, then the default for the maximum number of relationship occurrences to chase specified in the heading is used. For example, in Figure 5-20 on page 5-31 the number of occurrences to chase for the source PORDR DBD's application relation defaults to no limit because an entry was not made in the chase field. For more information, refer to "Limiting Target Databases" on page 5-32.

Limiting Target Databases

The value entered in the Occurrences To Chase or Default Max Relationship Occurrences to Chase field controls the number of segment occurrences to chase in a logical and/or application relationship. If a chased occurrence resides in a database with a logical and/or application relationship, then the value in this field for that particular relationship again controls the number of occurrences to chase within that database record. This process repeats itself until all desired relationships are resolved. The recommended value for the number of occurrences to chase on a bidirectional logical relationship is 2 or 3.

When you exclude a link to a target database in the selection criteria, those segments in the target database for that relationship are not selected.

If selection criteria are being applied to databases with recursive logical relationships (within the primary database or across related databases) and no limit is specified, every segment in the database is selected to resolve all the logical relationships. This process occurs regardless of any other selection criteria you specify. By entering a value greater than zero for Default Max Relationship Occurrences to Chase or the segment's Occurrences To Chase field, this situation can be prevented and a more desirable subset of the databases can be selected.

Note: If you enter a value greater than zero in this field, all logical children are extracted and written to the extract file. However, only some of the logical children have their related database records chased and extracted. Therefore, the extract file contains all logical child segments for the roots selected but only a portion of the destination parents that these logical children are to be connected to. When this extract file is used to load a database in Option 4.2, care should be taken to only use update mode (load processing options U or I). File-AID *for IMS* reports on all logical child segments where there are no related destination parents. This is not an error but is for informational purposes only. Loading an uninitialized database (load processing option L) with this type of extract file should not be done. A database loaded in this manner can become unusable because IMS is unable to connect all logical children with their destination parents.

Figure 5-21 and Figure 5-22 on page 5-33 illustrate limiting the selection of target databases based on two databases, DB1 and DB2. These databases have a physically paired bidirectional logical relationship between them. File-AID *for IMS* enables you to limit the selection of the segment occurrences for each direction of a paired relationship.

Figure 5-21. Example of Limiting Target Data Bases - Part 1

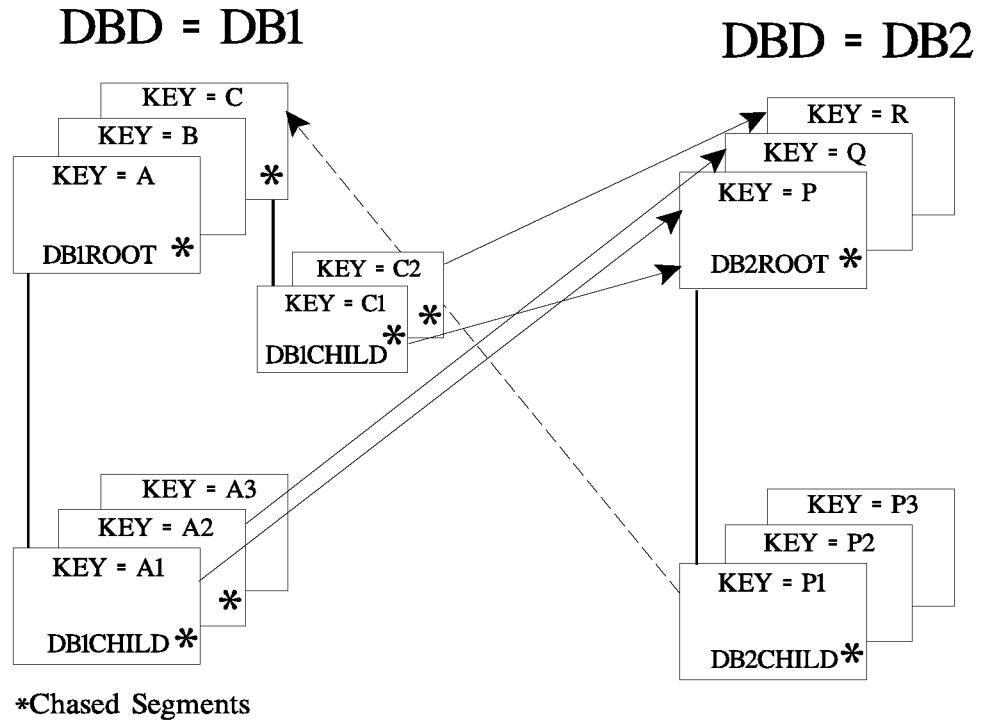


Figure 5-22. Example of Limiting Target Data Bases - Part 2

```

File-AID for IMS ----- Relationship Criteria ----- LINE 0001
COMMAND ==>                               SCROLL ==> CSR

Default max relationship occurrences to chase ==> 0          (0 = No limit)

Line   Source   Source   Related   Occurrences
Cmd    --DBD--- -Segment ---DBD--- -----Comment----- -To Chase -
-      PORDR                ORDR050  PCUST    LOGICAL- BI-DIR REL    2__
-      PCUST                VORDR050 PORDR   LOGICAL- BI-DIR REL    1__
-      *** END OF RELATIONS ***

Enter X to exclude a link to a target data base or
Use OCCURRENCES TO CHASE field to limit relations crossed to IMS/APPL REL DB
Enter END command when relationships have been fully specified
    
```

Figure 5-22 shows the two databases' relationships on the Relationship Criteria screen. To resolve the paired relationship from DB1 to DB2, the first two DB1CHILD segments chase a DB2ROOT database record. To resolve the paired relationship from DB2 to DB1, the first DB2CHILD segment chases a DB1ROOT database record.

Chapter 6.

File-AID for IMS/ISPF Segment/Layout Cross Reference

This chapter describes the Segment/Layout Cross Reference function of File-AID for IMS/ISPF, Option 7, which is used to create and maintain segment/layout cross references (XREFs) for use in the File-AID for IMS/ISPF Browse, Edit, Extract, and Select Criteria functions and also in the File-AID for IMS Batch XREF Update Facility.

The purpose of a segment/layout XREF is to associate a COBOL or PL/I segment layout with each segment type in a database. The XREF function uses your existing DBD load module members to determine the segment types in the database and then prompts you to enter the corresponding segment layout members for each segment type.

In addition, you can specify segment layout information associated with logical child and concatenated segments defined in the DBD and for segment types with multiple formats (that is, those segment types that require more than one segment layout to define the segment data). You can also use the XREF function to isolate the appropriate layout if multiple segment layouts are contained within a single COBOL or PL/I member or if the segment layout is hard-coded in a COBOL or PL/I program.

Segment/Layout XREF Dataset Specification

The Segment/Layout XREF - Dataset Specification screen is displayed when you select Option 7 on the Primary Option Menu.

Figure 6-1. Segment/Layout XREF - Dataset Specification Screen

```

File-AID for IMS -- Segment/Layout XREF - Dataset Specification -----
COMMAND ==>

Enter dataset name of segment/layout XREF to be edited:

Segment/Layout XREF dataset ==> 'CW.FISAMP.XREFC'
Member ==> PORDR (Blank or pattern for member list)

Use DBDLIB datasets for addition ==> N (Y = Yes; N = No)

DBDLIB dataset 1 ==> 'CW.FISAMP.DBDLIB'
Dataset 2 ==>

```

Segment/Layout XREF Dataset : Enter the dataset name of the segment/layout XREF to be edited. The dataset must conform to the characteristics of a valid segment/layout XREF dataset.

Member : Enter the dataset member, if any, of the segment/layout XREF to be edited. If the segment/layout XREF dataset is partitioned and no member is specified, the XREF Member List screen is displayed. Select a member for processing from the Member List screen.

Use DBDLIB Datasets for Addition : Enter Y if you are creating a new XREF or adding DBDs to the XREF.

DBDLIB Dataset 1 and Dataset 2 : Enter the DBD LIB dataset names that contain the DBDs you want to add to the XREF. You can enter two DBDLIB datasets to serve as the concatenated source. If you enter two DBD load library names and their

blocksizes are different, you must enter the library with the larger blocksize on the first dataset name line. When two DBD libraries are entered, File-AID *for IMS* searches the first library before the second when looking for the DBD member. If you specify only one DBD library, it can be entered on either DBDLIB dataset line.

If your installation has both the COBOL and PL/I language support options installed, you should ensure that your current language mode is compatible with the segment/layout XREF dataset and member you specify. You can change language modes by entering the COBOL or PL/I primary command on this screen or by entering the =0 jump command, which switches you to Option 0 - File-AID *for IMS* Parameters.

Terminating the Screen

Do one of the following to terminate the Segment/Layout XREF Specification screen:

- Press ENTER to proceed to the next EDIT XREF Segment List screen.
 - If you selected a logical child segment, the Segment List screen (Figure 6-7 on page 6-9) is displayed.
 - If you selected a concatenated segment, the Segment List screen (Figure 6-9 on page 6-11) is displayed.
 - If you entered an * or *MULT-RTV* in the Member field, the Edit Record Type 1 screen (Figure 6-11 on page 6-13) is displayed.
- Enter the END or RETURN primary command to terminate the XREF function and return to the Primary Option Menu.

EDIT XREF Segment List

When you press ENTER on the Segment/Layout XREF Dataset Specification screen, the EDIT XREF Segment List screen is displayed. This screen is used to associate segment layouts with the various segment types in a DBD.

Figure 6-2. EDIT XREF Segment List Screen

```

EDIT XREF - CW.IXPSAMP.XREFC(PORDR) ----- ENTRY 00001
COMMAND ===>                                SCROLL ===> CSR

Description ===> CUST AND ORDER DBD
Line  Data          Segment  COBOL      Segment  Starting COBOL Data-name
Cmd   Base          Segment  Member     Description (Blank for entire COBOL MBR)
-----
PCUST  CUST010  CUST010  CUSTOMER ROOT
      CUST020  CUST020  CUST SHIPMENT
      VORDR050 *LCHILD* VIRTUAL ORDR050
PORDR  ORDR010  ORDR010  ORDER ROOT
      ORDR020 *MULT-RTV* ORDER LINE
      ORDR040  ORDR040  ORDER SCRAP
      ORDR050 *LCHILD*  ORDR-CUST LCHLD
                        *** END OF SEGMENT LIST ***

To specify record type values, enter "*" for member name and enter "S" line cmd
To specify concatenated/lchild segment information, enter "S" line cmd

Enter "DELETE/INSERT dbd-name" to delete/add a DBD from/to the seg/layout XREF16

```

Description : Enter up to a 30-character description of the XREF. The description is displayed whenever an XREF member list is used.

Line Cmd : Enter a line command. Line commands are used to insert and delete segment entries from a DBD in the XREF. The S line command is used to select logical child and concatenated segments and segments with multiple formats so that segment layout information can be specified for these types of segments.

I (Insert) Line Command :

Adds a segment entry immediately following the entry where the command is entered. Once the entry is inserted, you must specify a segment name and corresponding segment layout member. Only one insert line command can be entered per interaction. The insert line command cannot be entered with a select line command.

D (Delete) Line Command :

Deletes a segment entry from a DBD in the XREF. Any number of delete line commands can be entered simultaneously with or without an occurrence of one of the other line commands.

S (Select) Line Command :

Select logical child and concatenated segments and segments with multiple formats for editing. The select line command is valid only for these types of segments. Logical child and concatenated segments are automatically identified by displaying *LCHILD* and *CONCAT* in the Member field. Segments with multiple formats are identified by entering an * or *MULT-RTV* in the Member field. When you select one of these types of segments, the appropriate screen is displayed to enable you to enter the segment layout information.

The S line command cannot be entered with the insert command, and only one S line command can be entered per interaction.

Data Base : Displays the DBD member name and is protected and not modifiable. The DBD member name is displayed next to the first segment name within each DBD and, if you scroll the Segment List screen, next to the segment name displayed on the first screen body line.

Segment : Displays the segment name of each segment defined in a DBD. The segment names can be typed over.

Member : Enter either a member name or an asterisk. The most common entry is the member name within your segment layout library that contains the segment layout defining the segment data. If a segment type has multiple formats that require more than one segment layout to define them, enter an asterisk or *MULT-RTV* in this field. You can then select that entry and proceed to the EDIT Record Type 1 screen on page Figure 6-11 on page 6-13 where you can enter the multiple segment layout member names.

Logical child and concatenated segments defined in a DBD are automatically identified when the DBD is added to the XREF. File-AID for IMS displays *LCHILD* or *CONCAT* in the Member field. For these types of segments, the Member field is protected and not modifiable. How to specify segment layout information for logical child and concatenated segments is described in "Logical Child Segment" on page 6-8.

If the layout which defines a segment is hard-coded in a COBOL or PL/I program, enter the program name in the Member field and specify a starting data-name.

This field's heading is displayed with either COBOL or PL/I preceding the word MEMBER depending on your current language mode.

Segment Description : Enter a 15-character description for each segment type. If entered, the description is displayed in the heading lines on the Formatted and Unformatted Browse/Edit screens.

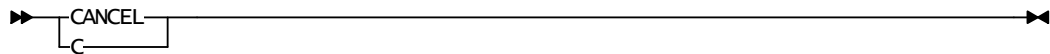
Starting Data-Name : Enter a starting data-name within the COBOL or PL/I member to isolate the appropriate segment layout. This action is required only if multiple segment layouts are contained within a single segment layout library member or if a segment layout is hard-coded in a COBOL or PL/I program. The starting data-name must not contain embedded blanks, but it is not otherwise validated against the segment layout until you use the segment/layout XREF in another File-AID *for IMS* function. File-AID *for IMS* reads the layout (or program) beginning with the starting data-name and stops reading when a data-name item with a numerically equal or lower level number is encountered or when the end of the layout is reached.

Primary Commands

The following primary commands are available in the Segment/Layout XREF screens.

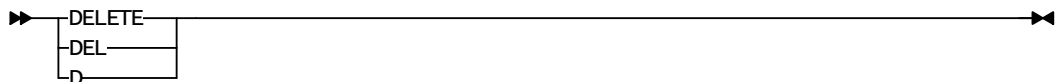
CANCEL

Terminates the XREF edit session without performing a save operation. All changes made since the last save are not reflected in the XREF. The Segment/Layout XREF - Dataset Specification screen is displayed.



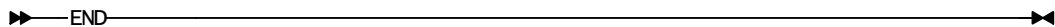
DELETE

Deletes an entire DBD from the segment/layout XREF. Deleting a DBD from the XREF has no affect on your corresponding DBD load module member.



END

Terminates editing of the current XREF and displays the Segment/Layout XREF - Dataset Specification screen. If any changes were been made to the XREF member since the last save, a save operation is performed.

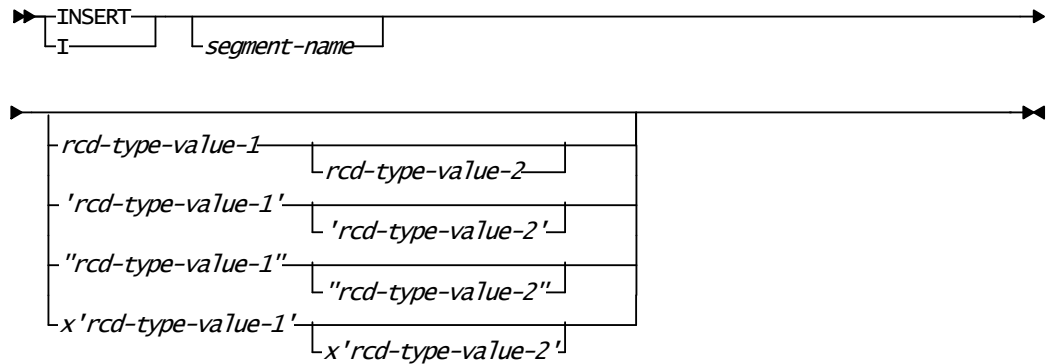


INSERT

Adds DBDs to a segment/layout XREF. During insert processing all segments defined in the DBD are added to the XREF. The newly inserted DBD is added in alphabetical order by DBD name and the XREF Segment List screen is automatically scrolled to the inserted DBD. The segment names defined in the DBD are prefilled in the Segment field of the screen. Because concatenated and logical child segments are automatically identified during insert processing, *CONCAT* or *LCHILD* is displayed in the Member field for those segments. Otherwise, the segment names defined in the DBD are prefilled in the Member field. How to specify segment layout information for concatenated and logical child segments and segments with multiple formats is described later in this chapter.

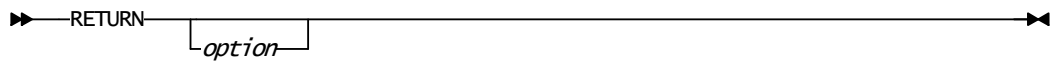
You can add as many DBDs to a single segment/layout XREF as you want, however, future enhancements to File-AID *for IMS* may require that you define only one DBD per XREF

member and that the XREF member name matches the DBD name. Message "I615" is displayed when an INSERT command is issued to warn you of this.



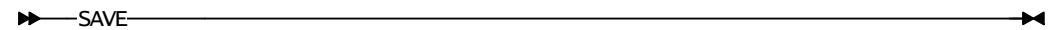
RETURN

Returns to the Primary Option Menu or to the specified option, if any. As with the END command, changes made to the XREF since the last save are written to the XREF dataset.



SAVE

Writes the segment/layout XREF information back to the same dataset from which it was read. The library statistics for the member are updated. The save operation checks that segment layout information was specified for all logical child and concatenated segments and for segments with multiple formats. Unspecified segment layout information for these types of segments does not result in an error condition until you attempt to save the XREF with an END, RETURN, or SAVE command.



Segment/Layout Cross Reference Examples

Following are segment/layout XREF examples.

Adding a DBD to an XREF

Before you can browse or edit a database in formatted mode or edit and apply formatted field selection criteria in another File-AID *for IMS* function, you need to add the DBD that defines that database to a segment/layout XREF. Once the DBD is added to the XREF and the segment layout names are entered for each segment in the DBD, there is no need to edit the XREF again unless there are subsequent DBD or segment layout member name changes.

If you are adding a DBD, you must enter a Y in the Use DBDLIB datasets for addition field on the Segment/Layout XREF Dataset Specification screen. You must also enter the DBDLIB dataset name that contains the DBD you want to add.

Use the INSERT primary command to add DBDs to the XREF member. In Figure 6-3, the INSERT command is used to add the PPART DBD to the PORDR XREF member.

Figure 6-3. Edit XREF Segment List Screen - Before Inserting a New DBD

```

cEDIT XREF - CW.FISAMP.XREF(PORDR) ----- ENTRY 0001
COMMAND ===> INSERT PPART                                SCROLL ===> CUR

Description ===> CUST AND ORDER D.B. XREFS
Line  Data          COBOL      Segment      Starting COBOL Data-name
Cmd   Base   Segment  Member      Description  (Blank for entire COBOL MBR)
-----
      PCUST      CUST010  CUST010     CUSTOMER ROOT
              CUST020  CUST020     CUST SHIPMENT
              VORDR050 *LCHILD*   VIRTUAL ORDR050
      PORDR      ORDR010  ORDR010     ORDER ROOT
              ORDR020  *MULT-RTV* ORDER LINE
              ORDR040  ORDR040     ORDER SCRAP
              ORDR050  *LCHILD*   ORDR-CUST LCHLD
                                   *** END OF SEGMENT LIST ***

To specify record type values, enter "*" for member name and enter "S" line cmd
To specify concatenated/lchild segment information, enter "S" line cmd

Enter "DELETE/INSERT dbd-name" to delete/add a DBD from/to the seg/layout XREF
    
```

The result of the INSERT command is shown in Figure 6-4 on page 6-6. The DBD was added in alphabetical order by DBD name and the Segment List screen scrolled to the inserted DBD.

An informational message (I615) is displayed when an INSERT command is used. Refer to the description of the INSERT command in “Primary Commands” on page 6-4.

Figure 6-4. Edit XREF Segment List Screen - After Inserting A New DBD

```

EDIT XREF - CW.FISAMP.XREF(PORDR) ----- ENTRY 0001
COMMAND ===>                                SCROLL ===> CUR

Description ===> CUST AND ORDER D.B. XREFS
Line  Data          COBOL      Segment      Starting COBOL Data-name
Cmd   Base   Segment  Member      Description  (Blank for entire COBOL MBR)
-----
      PPART      PART010  PART010
              PART020  PART020
                                   *** END OF SEGMENT LIST ***

To specify record type values, enter "*" for member name and enter "S" line cmd
To specify concatenated/lchild segment information, enter "S" line cmd

Enter "DELETE/INSERT dbd-name" to delete/add a DBD from/to the seg/layout XREF16
    
```

The segment names defined in the PPART DBD are prefilled in the Segment field. For concatenated and logical child segments and segments with multiple formats, you must select the segment and proceed to the appropriate screen to specify segment layout information, otherwise, the segment name defined in the DBD is prefilled in the Member field.

Maintaining a DBD in an XREF

You may be required to change an XREF after a DBD has been added to it. Maintenance to a DBD within an XREF is necessary if segment names change or if segments are added to or deleted from the DBD. Also, segment layout member names can change, which will require maintenance to the Member field.

Note: Changes made to a DBD within an XREF have no effect on the DBD load module member. Also, maintenance to an XREF is not validated against the DBD member until it is used in another File-AID *for IMS* function. If changes occur in a DBD, it is recommended that you change your DBD source and perform a DBDGEN and then change the XREF member to reflect the changes made to the DBD.

In Figure 6-5, the PORDR and PPART DBDs within the XREF will change. Segment ORDR040 will be deleted and a new segment entry will be inserted immediately below the PART020 segment.

Figure 6-5. Edit XREF Segment List Screen - Before Changing a XREF

```

EDIT XREF - CW.FISAMP.XREF(PORDR) ----- ENTRY 00001
COMMAND ==>                                SCROLL ==> CUR

Description ==> CUST AND ORDER D.B. XREFS
Line  Data          COBOL      Segment      Starting COBOL Data-name
Cmd   Base   Segment  Member      Description  (Blank for entire COBOL MBR)
-----
      PCUST      CUST010  CUST010     CUSTOMER ROOT
              CUST020  CUST020     CUST SHIPMENT
              VORDR050 *LCHILD*   VIRTUAL ORDR050
      PORDR      ORDR010  ORDR010     ORDER ROOT
              ORDR020  *MULT-RTV* ORDER LINE
D      ORDR040  ORDR040     ORDER SCRAP
              ORDR050  *LCHILD*   ORDR-CUST LCHLD
      PPART      PART010  PART010     PART ROOT
      I      PART020  PART020     PART LOCATION
              *** END OF SEGMENT LIST ***

To specify record type values, enter "*" for member name and enter "S" line cmd
To specify concatenated/lchild segment information, enter "S" line cmd

Enter "DELETE/INSERT dbd-name" to delete/add a DBD from/to the seg/layout XREF

```

Figure 6-6 shows the result of the D and I line commands. The ORDR040 segment was removed and a blank entry was added below the PART020 segment. The segment name and corresponding segment layout member must now be specified for the inserted entry.

Figure 6-6. Edit XREF Segment List Screen - After Changing an XREF

```

EDIT XREF - CW.FISAMP.XREF(PORDR) ----- ENTRY 00001
COMMAND ==>                               SCROLL ==> CUR

Description ==> CUST AND ORDER D.B. XREFS
Line  Data  ==> COBOL Segment Starting COBOL Data-name
Cmd  Base  Segment Member Description (Blank for entire COBOL MBR)
-----
PCUST  CUST010 CUST010 CUSTOMER ROOT
      CUST020 CUST020 CUST SHIPMENT
      VORDR050 *LCHILD* VIRTUAL ORDR050
PORDR  ORDR010 ORDR010 ORDER ROOT
      ORDR020 *MULT-RTV* ORDER LINE
      ORDR050 *LCHILD* ORDR-CUST LCHLD
PPART  PART010 PART010 PART ROOT
      PART020 PART020 PART LOCATION

*** END OF SEGMENT LIST ***

To specify record type values, enter "*" for member name and enter "S" line cmd
To specify concatenated/lchild segment information, enter "S" line cmd
    
```

Note: You cannot add a logical child or concatenated segment by using the I line command. If a logical child or concatenated segment has been added to the DBD, you must delete the existing DBD and use the INSERT primary command to reinsert the DBD.

Terminating the Screen

Do one of the following to terminate the EDIT XREF Segment List screen:

- Enter the END or RETURN command to terminate the XREF edit session. A save operation is performed.
- Enter the CANCEL command to terminate the XREF edit session. A save operation is not performed.

Logical Child Segment

When you select a logical child segment entry on the EDIT XREF Segment List screen, the EDIT XREF Logical Child Segment screen is displayed.

A logical child segment is made up of two parts:

- Destination Parent Concatenated Key (DPCK)
- Logical child data

The EDIT XREF Logical Child Segment screen is used to specify the segment layout information that defines these two parts. This screen also provides the flexibility to have the segment layout define the DPCK portion of the logical child segment.

Figure 6-7. EDIT XREF Logical Child Segment Screen

```

EDIT XREF - CW.FISAMP.XREFC(PORDR) -----
COMMAND ==>
DATA BASE: PORDR   SEGMENT: ORDRCUST

Specify COBOL information for Logical Child segment:

----- Destination Parent Concatenated Key (DPCK) -----
DPCK included in the first COBOL MBR below ==> N (Y = Yes; N = No)
If no, specify the length of the DPCK ==> 8

----- COBOL Member - Defines LCHILD Segment Data -----
Specify COBOL MBR ==> ORDR050   (Blank if LCHILD is KEY-016NLY)
Starting Data-name ==>                (Blank for entire mbr)

Note - There are 2 portions to a Concatenated segment:
1. Destination Parent Concatenated Key (Total DPCK Key Length = 8)
2. Logical Child Data                DBD: PORDR   Segment: ORDR050

Enter END command to return to the Segment/Layout XREF Segment List screen

```

Destination Parent Concatenated Key : Indicate whether the DPCK is included in the segment layout that defines the logical child data. If the DPCK is not included in the segment layout, enter N and the length of the DPCK. File-AID *for IMS* calculates the total length of the DPCK and prefills this field upon entry to this screen. The total DPCK length is calculated and displayed on the bottom of the screen. Below the DPCK length are the DBD and segment name of the logical child segment as defined in its physical DBD. You can type over the DPCK length if the segment layout defines part of the total DPCK.

When the DPCK is not included in the layout, a segment layout entry is generated that describes the DPCK when the logical child segment is displayed in formatted mode. If the logical child segment is variable length and the DPCK is not included in the segment layout, a two-byte data-name is generated for the Segment Size field in addition to the DPCK portion of the layout.

If the DPCK is included in your segment layout, enter a Y in the DPCK field. If you enter a Y in this field, the DPCK length is ignored. The default value is N upon initial entry to this screen.

LCHILD Segment Data : Enter the segment layout member name that defines the logical child data in the Member field. If multiple segment layouts are contained within a single segment layout member, you can specify a starting data-name within the member to isolate the appropriate layout. Refer to page “Starting Data-Name” on page 6-4 for more details on the starting data-name option.

Terminating the Screen

Do one of the following to terminate the EDIT XREF Logical Child Segment screen:

- Enter the END command to return to the EDIT XREF Segment List screen.
- Enter the RETURN command to terminate the XREF edit session. A save operation is performed.
- Enter the CANCEL command to terminate the XREF edit session. A save operation is not performed.
- Enter the SAVE command to write the segment/layout XREF information back to the same dataset from which it was read.

Figure 6-8. Formatted Display of Logical Child Segment Screen

```

EDIT - CW.FISAMP.ORDER1 ----- (DBD-PORDR )- LINE 00001
COMMAND ==>                               SCROLL ==> CSR
PARENT  ORDR010
SEGMENT ORDR050  CONCATENATED KEY: AA2222,01
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- -----FIELD VALUE-----
01 LCHILD-SEGMENT
02 DESTINATION-PARENT-KEY              C   8   CN000101
-----
02 ORDER-SHIPMENT-DATA
06 ORDER-SHIPMENT-KEY
08 LOCATION-NUMBER                    Z   2   K 01
06 SCHEDULED-SHIPPING-QUANTITY        PS  8   2 22.00
06 ACTUAL-SHIPPING-QUANTITY           PS  8   2 21.00
06 SCHEDULED-SHIPPING-DATE            C   8   19881012
06 ACTUAL-SHIPPING-DATE                C   8
06 PACKAGE-INDICATOR                  C   2   RD
06 SHIPMENT-CODE                      Z   1   8
06 SHIPMENT-COST                      P   8   2 400.00
*** END OF LAYOUT. LENGTH =    47 ***

ENTER UNFMT TO SWITCH TO UNFORMATTED MODE, CHAR TO SWITCH TO CHARACTER MODE

```

Figure 6-8 shows the logical child segment in edit formatted mode based on the entries on the EDIT XREF Logical Child Segment screen on page Figure 6-7 on page 6-9. Notice that File-AID for IMS generates the DPCK and separates it from the logical child data with a dashed line. If the segment layout is included the DPCK, a dashed line is not displayed.

Concatenated Segment

When you select a concatenated segment entry on the EDIT XREF Segment List screen, the EDIT XREF Concatenated Segment screen is displayed.

A concatenated segment consists of the following parts:

- Destination Parent Concatenated Key (DPCK)
- Logical child data
- Destination parent data

The EDIT XREF Concatenated Segment screen is used to specify the segment layout information defining these parts. This screen provides the flexibility to have your segment layouts define the DPCK portion of the concatenated segment.

Figure 6-9. Edit XREF Concatenated Segment Screen

```

EDIT XREF - CW.FISAMP.XREF(LORDR) -----
COMMAND ==>
DBD: LORDR   SEG: ORDRCUST   ORDR-CUST CNCAT

Specify COBOL information for Concatenated segment:

----- Destination Parent Concatenated Key (DPCK) -----
DPCK included in the first COBOL MBR below ==> Y (Y = Yes; N = No)
If no, specify the length of the DPCK ==>

----- First COBOL Member - Defines LCHILD OR Concatenated Segment Data -----
Specify COBOL MBR ==> ORDR051 (Blank if LCHILD is KEY-ONLY)
Starting Data-name ==> (Blank for entire mbr)

----- Second COBOL Member - Defines Destination Parent Data -----
Specify COBOL MBR ==> CUST020 (Blank if DEST. PARENT is KEY-ONLY)
Starting Data-name ==> (Blank for entire mbr)

Note - There are 3 portions to a Concatenated segment:
1. Destination Parent Concatenated Key (Total DPCK Key Length = 8)
2. Logical Child Data Data Base: PORDR Segment: ORDR050
3. Destination Parent Data Data Base: PCUST Segment: CUST020

Enter END command to return to the Segment/Layout XREF Segment List screen

```

Destination Parent Concatenated Key (DPCK) : Indicate whether the DPCK is included in the segment layout that defines the logical child or concatenated segment data. If the DPCK is not included in the segment layout, enter N and the length of the DPCK. File-AID for IMS calculates the total length of the DPCK and prefills this field upon initial entry to this screen. The length is displayed at the bottom of the screen. Below the DPCK length are the DBD and segment name of the logical child segment as defined in its physical DBD. You can type over the DPCK length if the segment layout defines part of the total DPCK.

When the DPCK is not included in the layout, a segment layout entry is generated that describes the DPCK when the concatenated segment is displayed in formatted mode.

If the DPCK is included in your segment layout, enter a Y in the DPCK field. If you enter a Y in this field, the DPCK length is ignored. The default value is N upon initial entry to this screen.

Defines LCHILD or Concatenated Segment Data : In the first Specify Member field, enter the segment layout member name that defines the logical child data only or one that defines the entire concatenated segment data, including the logical child and destination parent data. This function provides the option of using one or two segment layouts to define a concatenated segment.

If the logical child portion of the concatenated segment is defined in the logical DBD as having key-only sensitivity, then IMS does not place the data portion of the segment in the I/O area. In this situation, leave the first Specify Member field blank.

If multiple segment layouts are contained within a single segment layout member, you can specify a starting data-name within the member to isolate the appropriate layout. Refer to "Starting Data-Name" on page 6-4 for details about the starting data-name option.

Defines Destination Parent Data : In the second Specify Member field, enter the segment layout member name that defines the destination parent data. Leave this member name blank if the member entered in the first Specify Member field defines the entire concatenated segment or if the destination parent is defined in the logical DBD as having key-only sensitivity.

The starting data-name feature can also be used for the Destination Parent segment layout member.

Figure 6-10 shows the concatenated segment in formatted mode based on the entries specified on the EDIT XREF Concatenated Segment screen Figure 6-9 on page 6-11.

Figure 6-10. Formatted Display of Concatenated Segment

```

EDIT - CW.FISAMP.ORDER1 ----- (DBD-LORDR )- LINE 00001
COMMAND ===>                               SCROLL ===> CSR
PARENT  ORDR010
SEGMENT ORDRCUST  CONCATENATED KEY: AA2222,01
-----LEVEL NUMBER/DATA-NAME----- -FORMAT- -----FIELD VALUE-----
01 LOGICAL-CHILD-INFORMATION
05 DESTINATION-PARENT-CONCAT-KEY
07 CUSTOMER-NUMBER           C  6  CN00001
07 LOCATION-NUMBER           Z  2  01
05 LOGICAL-CHILD-SHIPPING-INFO
07 LOCATION-NUMBER           Z  2  K 01
07 SCHEDULED-SHIPPING-QUANTITY PS 8 2 22.00
07 ACTUAL SHIPPING QUANTITY  PS 8 2 21.00
07 SCHEDULED-SHIPPING-DATE   C  8  19881012
07 ACTUAL-SHIPPING-DATE     C  8
07 PACKAGE-INDICATOR        C  2  RD
07 SHIPMENT-CODE            Z  1  8
07 SHIPMENT-COST            P  8 2 400.00
-----
01 CUSTOMER-SHIPMENT-DATA
05 CUSTOMER-SHIPMENT-KEY
07 LOCATION-NUMBER           Z  2  01
05 SHIPPING-ADDRESS
ENTER UNFMT TO SWITCH TO UNFORMATTED MODE, CHAR TO SWITCH TO CHARACTER MODE

```

Notice that there is not a dashed line separating the DPCK from the logical child data. This is because the EDIT XREF Concatenated Segment screen Figure 6-9 on page 6-11 indicated that the DPCK was included in the COBOL layout. If one COBOL layout was used to define the entire concatenated segment and the layout included the DPCK, dashed lines do not appear.

Terminating the Screen

Do one of the following to terminate the EDIT XREF Concatenated Segment screen:

- Enter the END command to return to the XREF Segment List screen.
- Enter the RETURN command to terminate the XREF edit session. A save operation is performed.
- Enter the CANCEL command to terminate the XREF edit session. A save operation is not performed.
- Enter a SAVE command to write the segment/layout XREF information back to the same dataset from which it was read.

Edit Record Type 1 Entries

When you enter an * or *MULT-RTV* in the Member field on the EDIT XREF Segment List screen and select that entry, the EDIT Record Type 1 screen is displayed.

This screen is used to specify segment layout information for segments with multiple formats. For this type of segment there are up to two fields within the segment that contain values that indicate the segment format. In File-AID for IMS these values are called record type values. On the Edit Record Type 1 screen, you enter all possible record type values that can appear in the segment's Record Type Value 1 field.

Figure 6-11. Edit Record Type 1 Screen

```

EDIT Record Type 1 - CW.FISAMP.XREFC(PORDR) ----- ENTRY 001
COMMAND ==>                                     SCROLL ==> CSR

      Data base: PORDR      Segment: ORDR020      ORDER LINE
Specify record type 1:
      Position ==> 5
      Length   ==> 2   (1-16)

"D" - Delete      Record Type      COBOL      Comments
"S" - Select      Value 1           Member      or Starting Dataname (IND = Y)  IND
-----
      PO           PO              ORDR020     PURCHASE ORDER LAYOUT           N
      SC           SC              ORDR021     SUB-CONTRACT ORDER LAYOUT       N
      WO           WO              *MULT-RTV* *MULT-RTV*                       N
      *OTHER*     *OTHER*         ORDR022     *OTHER RCD TYPE VALUE 1*       N

To specify RECORD TYPE VALUE 2's for one of the above entries, enter "*"
in the COBOL Member column and select that entry

Enter END command to return to the Segment/Layout XREF Segment List screen

```

Position : Enter the starting position within the segment of the field that identifies the segment format (Record Type Value 1 field).

Length : Enter the length of the Record Type Value 1 field. The length of the Record Type Value 1 field can range from 1 to 16.

Delete/Select : Enter D to delete a record type value 1 entry or S to select a record type value 1 for which you want to specify record type value 2 values. You cannot delete an entry by entering blanks in each field.

Enter S to proceed to the Edit Record Type 2 screen (Figure 6-13 on page 6-15) to specify the record type value 2 values for a given record type value 1. When you select a record type value 1 for record type 2 processing and then return to the Edit Record Type 1 screen, the entry selected is displayed at the top of the screen body.

Record Type Value 1 : Enter one of the following:

- The specific values that appear in the Record Type Value 1 field.
- The literal *OTHER* if multiple record type value 1s are associated with one segment layout or have the same Record Type Value 2 field. A pre-formatted *OTHER* entry is automatically inserted as the last record type value 1 if one was not previously specified. This entry is for your convenience only and can be ignored if not needed.

You need not enter record type values in any particular sequence. When you enter the SAVE command or return to the XREF Segment List screen, the values are sorted in ascending sequence (except for the *OTHER* entry which remains last). Each record type value 1 must be unique. You can enter a maximum of 256 record type value 1s for a given segment type.

Member : Enter one of the following:

- The member name of the layout in the segment layout library that defines the segment format associated with the given record type value 1.
- An * or *MULT-RTV* if the format of the segment depends on a second field in the segment. Then select that entry and enter the record type value 2 information as described in "EDIT XREF Record Type 2 Screen" on page 6-15.

Comments or Starting Dataname : Enter a 30-character description for each record type value 1 or a starting data-name within the segment layout member. For pre-formatted *OTHER* entries, this field contains a default comment of "*OTHER RCD TYPE VALUE 1*."

If multiple segment layouts are contained within a single segment layout member, you can specify a starting data-name to isolate the appropriate layout. The starting data-name must not contain imbedded blanks, but it is not otherwise validated against the segment layout until you use the segment/layout XREF in another function. File-AID *for IMS* reads the layout from the segment layout member beginning with the starting data-name and stops reading when a data-name item with a numerically equal or lower level number is encountered or when the end of the layout is reached.

IND : Indicate whether you entered a comment or a starting data-name in the Comments or Starting Dataname field. Enter N or leave blank to indicate that the field contains comments. Enter Y to indicate that the field contains a starting data-name. The default is N.

Hexadecimal Format

If you want to enter record type values with non-displayable characters (for example, if the record type field is in packed decimal or binary format) you must use hexadecimal format. To switch between Character and HEX formats, use the HEX command.

HEX ON switches you to HEX format and HEX OFF switches you to Character format. In HEX format the record type values are shown in 3-line HEX format as shown in Figure 6-12. You can type over the Character or the HEX lines.

Figure 6-12. EDIT Record Type 1 Screen - Hex Format

```

EDIT Record Type 1 - CW.FISAMP.XREFC(PORDR) ----- ENTRY 001
COMMAND ==>                                     SCROLL ==> CSR

      Data base: PORDR      Segment: ORDR020      ORDER LINE
Specify record type 1:
Position ==> 5
Length   ==> 2 (1-16)

"D" - Delete      Record Type      COBOL      Comments
"S" - Select      Value 1           Member      or Starting Dataname (IND = Y)  IND
-----
      PO           ORDR020          PURCHASE ORDER LAYOUT          N
      DD
      76

      SC           ORDR021          SUB-CONTRACT ORDER LAYOUT          N
      EC
      23

To specify RCD TYPE VALUE 2's for one of the above entries, enter "*"
in the COBOL Member column and select that entry

Enter END command to return to the Segment/Layout XREF Segment List screen

```

Terminating the Screen

Do one of the following to terminate the EDIT Record Type 1 screen:

- Enter the SAVE command to write the segment/layout XREF information back to the same dataset from which it was read. If there is any unspecified segment layout information for segments with multiple formats or logical child or concatenated segments, the save operation returns you to the EDIT XREF Segment List screen and prompts you to enter any unspecified information.
- Enter the END command to return to the EDIT XREF Segment List screen.
- Enter the RETURN command to return to the Primary Option Menu. A save operation is performed.
- Enter the CANCEL command to terminate the XREF member edit session. A save operation is not performed.

Edit Record Type 2 Screen

When you enter an S in the Delete/Select field on the EDIT Record Type 1 screen, the EDIT Record Type 2 screen is displayed. This screen is used to specify values for the second record type value field associated with the given value of the first record type field.

Figure 6-13. EDIT XREF Record Type 2 Screen

```

EDIT Record Type 2 - CW.FISAMP.XREFC(PORDR) ----- DELETE INDICATOR INVALID
COMMAND ==>                                     SCROLL ==> CSR

      Data base: PORDR      Segment: ORDRO20      ORDER LINE
      Specify record type 2:      Record type value 1: *OTHER*
      Position ==> 58
      Length   ==> 2   (1-16)

      "D" - Delete      Record Type      COBOL      Comments
                       Value 2          Member      or Starting Dataname (IND = Y)  IND
      -----
                       *OTHER*         *OTHER*     *OTHER RCD TYPE VALUE 2*      N

Enter END to return to Segment/Layout XREF Record Type Value 1 Entries screen

```

Position : Enter the starting position in the segment of the second field used to identify the segment format. This field need not be contiguous to the first record type field.

Length : Enter the length of the second record type value field. The length of the record type value 2 field can range from 1 to 16.

Delete : Enter D in this field to delete record type 2 entries. You cannot delete an entry by entering blanks in each field.

Record Type Value 2 : Enter one of the following:

- The specific values that can appear in the Record Type Value 2 field.
- The literal *OTHER* if multiple record type value 2s are associated with one segment layout. A pre-formatted *OTHER* entry is automatically inserted as the last record type value 2 if one was not previously specified. This entry is for your convenience only and can be ignored if not needed.

You need not enter record type values in any particular sequence. When you enter the SAVE command or return to the EDIT Record Type 1 screen, the values are sorted in ascending sequence (except for the *OTHER* entry that remains last). Each record type value 2 must be unique. You can enter a maximum of 256 record type value 2s per record type value 1.

Member : Enter the member name of the layout in the segment layout library that corresponds to the record type value 1 and 2 combination.

Comments or Starting Dataname : Enter a 30-character description for each record type or a starting data-name within the segment layout member. For pre-formatted *OTHER* entries, this field contains a default comment of "*OTHER RCD TYPE VALUE 2*." Refer to "Starting Data-Name" on page 6-4 for a detailed description of the starting data-name feature.

IND : Indicate whether you entered a comment or a starting data-name in the Comments or Starting Dataname field. Enter N or leave blank to indicate that the field contains

comments. Enter Y to indicate that the field contains a starting data-name. The default value is N.

Hexadecimal Format

If you want to enter record 2 type values with non-displayable characters, you must use hexadecimal format. To switch between character and HEX formats, use the HEX command. HEX ON switches to HEX format and HEX OFF switches to character format. In HEX format the record type values are shown in 3-line HEX format. You can type over character or HEX lines.

Terminating the Screen

Do the following to terminate the EDIT Record Type 2 screen:

- Enter a SAVE command to write the segment/layout XREF information back to the same dataset from which it was read. If there is any unspecified segment layout information, the save operation returns you to the EDIT XREF Segment List or EDIT Record Type 1 screen and prompts you to enter any unspecified information.
- Enter the END command to return to the EDIT Record Type 1 screen.
- Enter the RETURN command to return to the Primary Option Menu. A save operation is performed.
- Enter the CANCEL command to terminate the XREF edit session. A save operation is not performed.

Appendix A.

Command Summary

This appendix contains a description of the primary and line commands within File-AID *for IMS/CICS* and File-AID *for IMS/DC*.

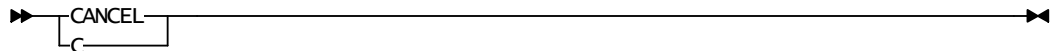
Primary Commands

Following is a description of the File-AID *for IMS* primary commands, including the command syntax and a brief explanation of the command function. Commands processed identically in ISPF/PDF and File-AID *for IMS* are noted with an asterisk (*).

Several commands described below have repetition factors as valid operands. This condition is symbolized by the character *n*. Except where noted, *n* must be a positive integer value between 1 and 2,147,483,647.

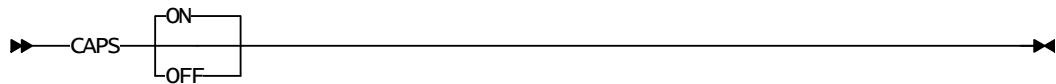
CANCEL

Removes the effect of segment type overs, which restores the original contents of the segments (Formatted, Unformatted and Character screens). For sequential and partitioned files, the CANCEL command ends the edit session without rewriting the records back to the file where they were read. As a result, all changes made since the last SAVE are not reflected in the file.



*CAPS

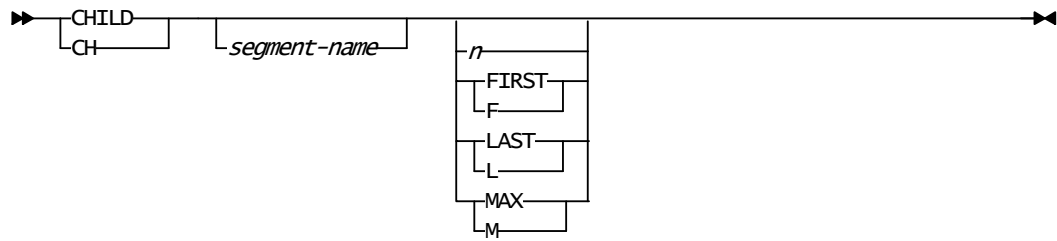
Controls whether alphabetic data entered should be automatically translated to upper case or left as-is.



CHILD

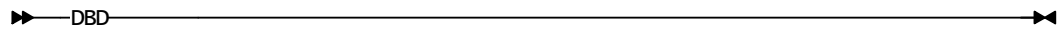
Retrieves the specified dependent segment occurrence under the current segment. If the SEGMENT-NAME operand is omitted, the current segment's first hierarchically dependent segment type defined in the DBD is used. The *n*, FIRST, LAST, and MAX operands indicate which occurrence of the specified segment-name you want to retrieve. If the OCCURRENCE operand is omitted, a default of one is assumed.

Note: The CHILD primary command is not valid for unkeyed segments (see also “Nonkeyed and Nonunique Segments” on page 2-50)



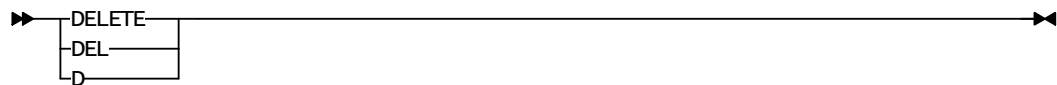
DBD

Causes an immediate return to the DBD Member List screen.



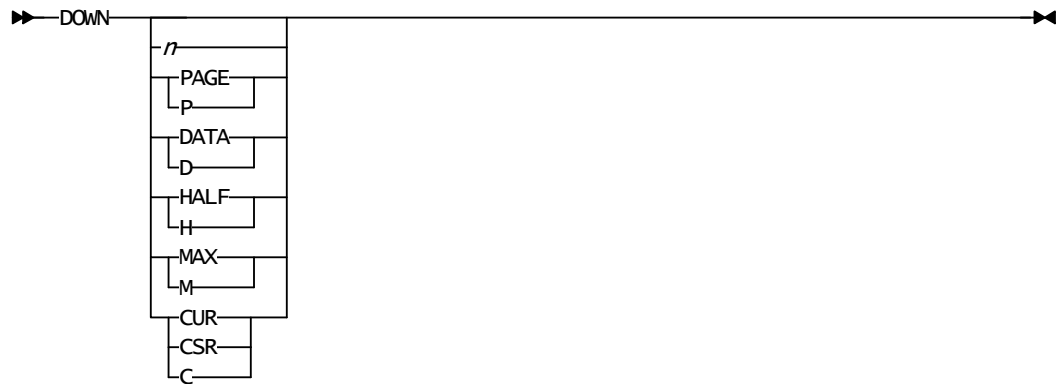
DELETE (Edit Mode only)

Used in edit mode to delete the current segment and all its hierarchical dependents.



DOWN

Causes scrolling toward the end of a segment, database, segment layout, or member list by the specified scroll amount.



*END

Used to do the following:

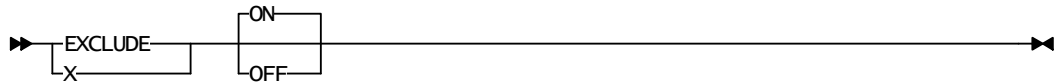
- Terminate the current screen and return control to the previous, higher level screen.
- Terminate the current screen and transfer control to the next screen in the conversation.

- Terminate File-AID *for IMS* if entered on the Primary Option Menu.

▶—END—▶

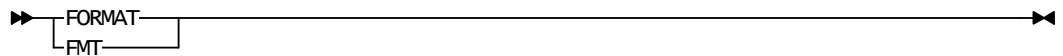
EXCLUDE (Edit Formatted only)

Unprotects or protects the left side of Edit Formatted screen so that the X line command can be entered to exclude lines.



FORMAT

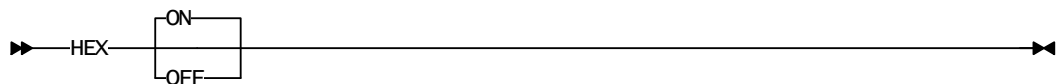
In the browse/edit modes, switches from Unformatted or Index mode to Formatted mode. In the Index mode, which displays several segments per screen, the first segment shown is selected for formatted display.



*HEX

Causes data to be displayed in either hexadecimal or character format. Hexadecimal format consists of a three-line display. The first line is the character format of the data and the next two lines represent the hexadecimal format of the data.

Note: In Browse/Edit, HEX is valid only in Unformatted mode.



INDEX

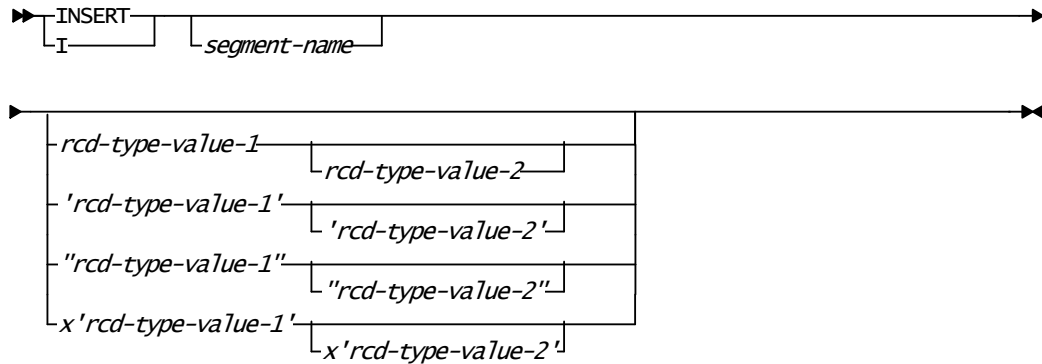
Switches from Formatted or Unformatted mode to Index mode in the browse/edit function. The segment where you are positioned when the command is entered is the first segment displayed on the Index screen.

▶—INDEX—▶

INSERT (Edit Mode only)

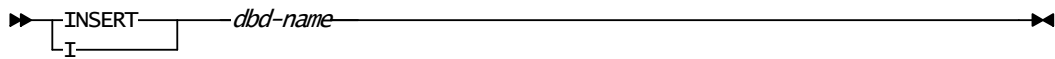
In edit mode, causes an occurrence of the specified segment to be inserted into a database. If the segment-name operand is omitted, you can insert only a new occurrence of the current segment type. The record type value operands indicate the record type to be inserted. They are valid with multiple record type segments only. Inserts in Formatted mode cause numeric fields to be initialized with zeros and character fields with blanks. Inserts in Unformatted mode cause segments to be initialized with blanks. INSERT causes

the Key Specification screen to be displayed where you can then specify the fully concatenated key of the segment you want to insert.



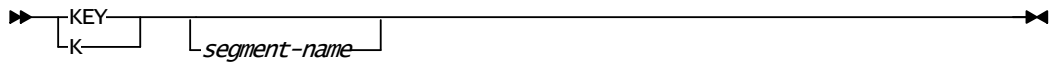
INSERT (Segment/Layout only)

Used in the Segment/Layout XREF function to add the specified DBD and its segments to the XREF member being edited.



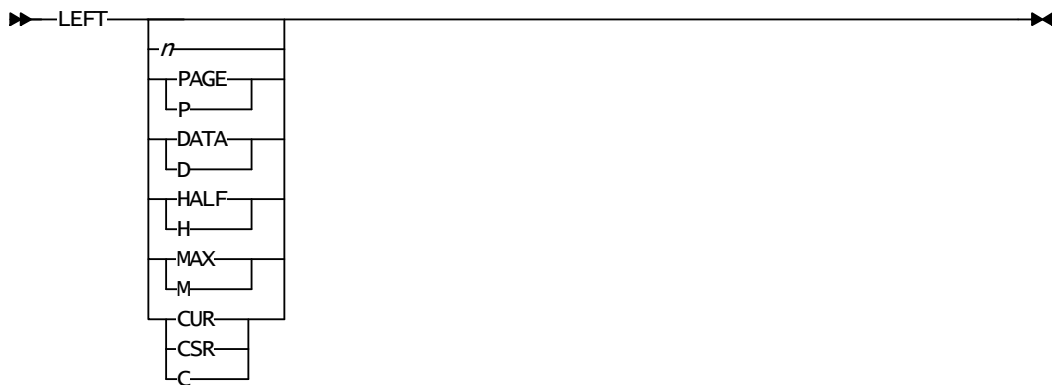
KEY

Used to change position in a database from the current segment to an occurrence of the specified segment. If the segment-name operand is omitted, you can reposition only to another occurrence of the current segment type. KEY causes the Key Specification screen to be displayed where you can then specify the fully concatenated key of the segment you want to retrieve.



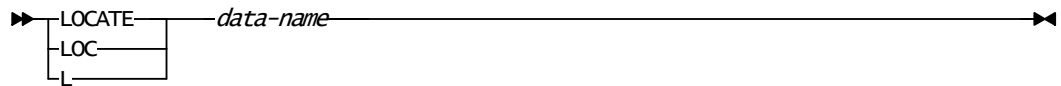
*LEFT

Causes scrolling toward the left margin of the displayed segments. Left scrolling is allowed for the Browse/Edit Character screen only.



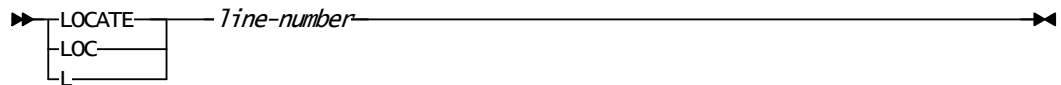
LOCATE (data-name)

Causes up or down scrolling to a specified segment layout data-name field. You can abbreviate the data-name. If the abbreviation applies to more than one segment layout line, scrolling is to the first one that applies, based on the current cursor position. You can also specify an occurrence number with the data-name or abbreviation for occurring fields. For example, LOCATE data-name (4). The data-name operand is valid only on the Browse/Edit Formatted and the Formatted Field Selection Criteria screens.



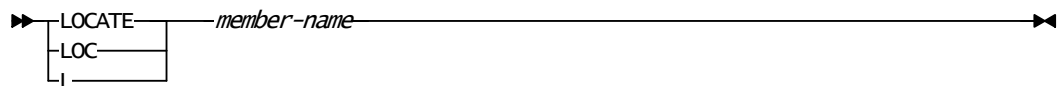
*LOCATE (line-number)

Causes up or down scrolling directly to the specified line number. If the line number entered exceeds the number of displayable lines, a line that designate the end of the scrollable lines is displayed.



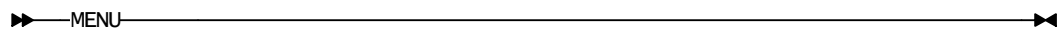
*LOCATE (member-name)

Causes up or down scrolling to the specified member name on a Member List screen. If you enter a member name that is not found, the last existing entry in the member list which alphabetically precedes the entered member name is displayed at the top of the screen.



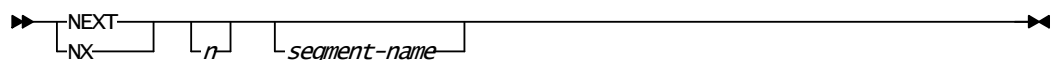
MENU

Causes an immediate return to the File-AID for IMS Primary Option Menu.



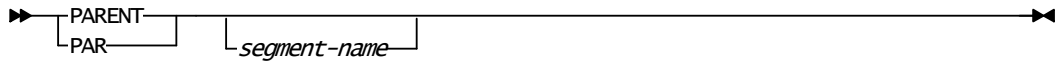
NEXT

Causes forward movement to the specified segment occurrence in a database. The NEXT command disregards parentage and hierarchical boundaries when retrieving a segment occurrence. If NEXT is entered without any operands, the next segment after the current segment is retrieved. If only the occurrence operand is entered, the nth segment occurrence that exists after the current segment is retrieved, regardless of segment type. If a segment-name is entered, only an occurrence of the specified segment can be retrieved.



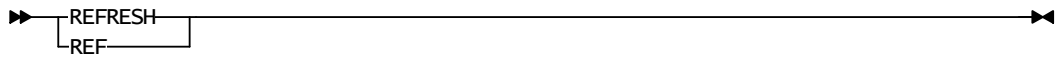
PARENT

Retrieves a parent of the current segment. If the segment-name operand is omitted, the immediate hierarchical parent of the current segment is retrieved. If the segment-name operand is specified, the segment named must exist above the current segment in the current hierarchical path.



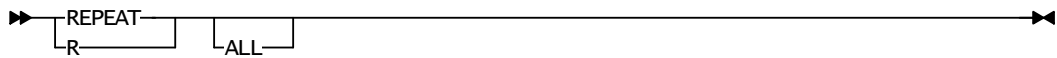
REFRESH

Retrieves the current version of the segment from the Formatted or Unformatted modes. Retrieves the current version of the first displayed segment that contains type overs from the Index mode.



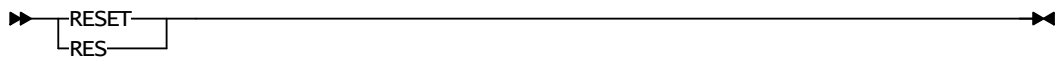
REPEAT

Causes the current segment to be repeated with a new key. If you enter the ALL operand, all dependent segments of the current segment are also repeated. Dependent segments repeated under a new parent retain their existing keys. REPEAT causes the Key Specification screen to be displayed where you can then specify the fully concatenated key of the new segment.



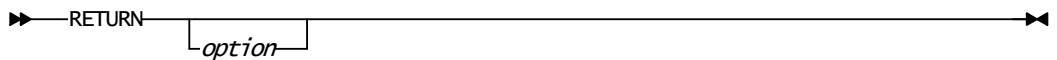
*RESET

The RESET command is used to remove all segment exclusions on the Browse/Edit Exclude Segment Specification screen.



*RETURN

Causes an immediate return to the Primary Option Menu or to the specified option. A save is automatically issued if any changes were made since the file was last saved.



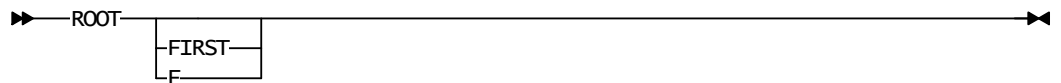
*RIGHT

Causes scrolling toward the right margin of the displayed segments. Right scrolling is allowed for the Browse/Edit Character screen only.



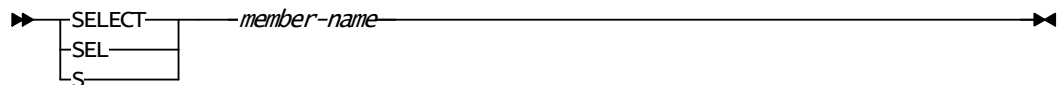
ROOT

Causes the root segment of the current segment to be retrieved. If the first operand is entered, the first root segment in a database is retrieved.



*SELECT

Entered from any member list display screen, this command is used to select a given member for processing. You can also select a member by entering an S line command next to the desired member.



TOG

In the browse/edit Formatted mode and on the Key Specification screen, switches to an alternate display to show an entire numerical field, if it is greater than 30 digits.



TWIN

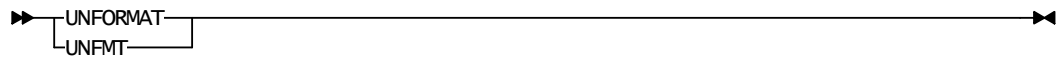
Causes the specified occurrence of the same segment type as the current segment, under the current parent, to be retrieved. If the occurrence operand is omitted, the next occurrence of the current segment type is retrieved. The *n* operand causes the *n*th segment occurrence after the current segment occurrence to be retrieved.

Note: The TWIN primary command is not valid for unkeyed segments (see also “Nonkeyed and Nonunique Segments” on page 2-50)



UNFORMAT

In the browse/edit option, switches from Formatted or Index mode to Unformatted mode. In the Index mode, which displays several segments per screen, the first segment shown is selected for unformatted display.



*UP

Causes scrolling toward the top of a segment, database, segment layout, or member list by the specified scroll amount.



Line Commands

Following is a list of File-AID *for IMS* line commands with a brief explanation of each command's function and the screens where the line command can be used. For a more detailed explanation of a command, refer to the chapter that covers the functions and screens where the command is used.

D (Delete) Command

Used on the Edit Index screen to delete a segment and its dependents.

I (Insert) Command

Used on the Edit Index screen to insert a new segment occurrence in a database.

K (Key) Command

Used on:

- Data Base Location screen to invoke the Key Specification screen, which enables you to specify keys and then switch to Formatted mode.
- Browse/Edit Character screen to invoke the Key Specification screen.

KI (KEY - Index mode) Command

Used on the Data Base Location screen to invoke the Key Specification screen, which enables you to specify keys and then switch to Index mode.

KU (KEY - Unformatted mode) Command

Used on the Data Base Location screen to invoke the Key Specification screen, which enables you to specify keys and then switch to Unformatted mode.

R (Repeat) Command

Used on the Edit Index screen to repeat a segment occurrence, which creates a segment with a new fully concatenated key and copied data.

RA (Repeat All) Command

Used on the Edit Index screen to repeat a parent segment occurrence and all its dependent segments. The new parent segment has a new fully concatenated key and copied data. The new dependent segments have copied keys and data.

S (Select) Command

Used on:

- Data Base Location screen to select a segment for formatted browsing/editing.
- Browse/Edit Index screen to select a segment for formatted browsing/editing.
- Any Member List screen to select a member for processing.

SI (Select - Index mode) Command

Used on the Data Base Location screen to select a segment for Index browsing/editing.

SU (Select - Unformatted mode) Command

Used on:

- Data Base Location screen to select a segment for Unformatted browsing/editing.
- Index screen to select a segment for Unformatted browsing/editing.

X (Exclude) Command

X	Exclude one line
Xn	Exclude <i>n</i> lines
XX	Exclude a block of lines

Indicates which lines are to be excluded from the display. Excluded lines are replaced by a single message line that indicates the number of lines and characters excluded from the display. A repetition factor can also be specified to indicate the number of lines to be excluded. You can exclude a block of lines by entering XX on the first and last lines of the block to be excluded.

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