IBM IMS Database Repair Facility for IMS Solution Packs

User's Guide

SC19-2916-04

Note:

Before using this information and the product it supports, read the information in “Notices” on page 105.

Fifth Edition (July 2022)

This edition applies to the IMS Database Repair Facility component that is delivered with Version 2.2 of IBM IMS Database Solution Pack for z/OS (program number 5655-DSP), Version 2.1 of IBM IMS Database Utility Solution for z/OS (program number 5698-DUL), Version 2.1 of IBM IMS Fast Path Solution Pack for z/OS (program number 5698-FPP), Version 3.1 of IBM IMS High Performance Pointer Checker for z/OS (program number 5655-U09), and to all subsequent versions and releases until otherwise indicated in new editions.

This edition replaces SC19-2916-03.

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About this information

This information describes IBM® IMS Database Repair Facility for IMS Solution Packs (also referred to as IMS Database Repair Facility) and explains how to run it interactively or in batch mode. The description of the interactive operation shows you the various panels and describes the input fields. With this information, you can repair IMS databases. The description of batch operation provides you with the necessary information to run IMS Database Repair Facility against VSAM data sets and IMS databases.

These topics provide instructions for installing, configuring, and using IMS Database Repair Facility.

These topics are designed to help database administrators, system programmers, application programmers, and system operators perform these tasks:

- Plan for the installation of IMS Database Repair Facility
- Install and operate IMS Database Repair Facility
- Customize your IMS Database Repair Facility environment
- Diagnose and recover from IMS Database Repair Facility problems
- Use IMS Database Repair Facility with other IMS products

To use these topics, you should have a working knowledge of:

- The z/OS® operating system
- ISPF
- SMP/E

Always refer to the IMS Tools Product Documentation web page for complete product documentation resources:

https://www.ibm.com/support/pages/node/712955

The IMS Tools Product Documentation web page includes:

- Links to IBM Documentation for the user guides ("HTML")
- PDF versions of the user guides ("PDF")
- Program Directories for IMS Tools products
- Recent updates to the user guides, referred to as "Tech docs" ("See updates to this information!")
- Technical notes from IBM Software Support, referred to as "Tech notes"
- White papers that describe product business scenarios and solutions

Chapter 1. IMS Database Repair Facility overview

IMS Database Repair Facility for IMS Solution Packs (also referred to as IMS Database Repair Facility) is a powerful tool to repair VSAM and OSAM organized IMS databases that contain pointer or data errors.

It can be run both interactively and in batch mode for VSAM and OSAM data sets. In batch mode for VSAM data sets, it supports both IMS data sets and non-IMS data sets. The interactive capabilities of IMS Database Repair Facility helps you make the repair in a short time, which means that the affected database need be taken offline only for a brief period. In this way, IMS Database Repair Facility enhances not only the integrity but also the availability of IMS databases.

Pointer and data corruption occur during power failure situations. They also might result from severe application errors or other mishaps to data sets that reside on DASD devices, such as I/O errors. Pointer errors are found by examining the output of Pointer Checker jobs; data errors are generally reported by end users.

When you determine the bad pointer or data, use the interactive IMS Database Repair Facility to navigate around the database for additional validation purposes. Do this step to verify that other pointers or data were not corrupted.

Using IMS Database Repair Facility, you can change the bad pointers and data to the values you think they should have. Despite the fact that you use utmost caution, errors sometimes occur.

To address this problem, IMS Database Repair Facility, when run interactively, has an Undo feature that reverses pointer and data changes. When IMS Database Repair Facility is used to update a database, the tool keeps a file of before and after pointer and data images. This file is kept until the next time IMS Database Repair Facility is started and used to create a change against the same database.

It is strongly recommended that you use the Pointer Checker utility immediately after you make updates to your database. Then, if an error is detected, you can use the interactive IMS Database Repair Facility's Undo function to back out the change.

This information is also true for the batch operation of IMS Database Repair Facility. However, no Undo facility is available. Instead, you can reverse changes made in error by using information that is provided in the Control Statements and Messages report.

IMS Database Repair Facility also provides the ILK Repair utility. Use the ILK Repair utility together with the HD Pointer Checker utility (of IMS HP Pointer Checker) to repair HALDB databases that have corrupted HALDB partition reorganization numbers, duplicate indirect list keys (ILKs), or potentially duplicate ILKs. For information about corrupted HALDB partition reorganization numbers, duplicate ILKs, or potentially duplicate ILKs, see the *IMS High Performance Pointer Checker User's Guide*.

Topics:

- “What's new in IMS Database Repair Facility” on page 2
- “IMS Database Repair Facility features and benefits” on page 3
- “Examples of IMS Database Repair Facility usage” on page 4
- “Hardware and software requirements” on page 4
- “Supported databases” on page 5
- “Compatibility with IMS Database Repair Facility 1.2” on page 6
- “Restrictions of IMS Database Repair Facility” on page 6
- “Service updates and support information” on page 6
- “Product documentation and updates” on page 6
- “Accessibility features” on page 7

What's new in IMS Database Repair Facility

This topic summarizes the functional enhancements that were made to IMS Database Repair Facility and documentation changes for this edition.

New and changed information is indicated by a vertical bar (|) to the left of a change. Editorial changes that have no technical significance are not noted.

SC19-2916-04 (July 2022)

Description	Related APARs
The following enhancements are made: • Obtains database definitions from IMS directory data sets if the IMS management of ACBs is enabled. • Displays IMS release level 15.2 in the IMS release field of IMS Database Repair Facility panels when used with IMS 15.2. The following topics have been added or updated: • "Hardware and software requirements" on page 4 • "Supported databases" on page 5 • "Preparing to run IMS Database Repair Facility" on page 9 • "Selecting a task from the Main menu" on page 11 • "Setting up IMS environment" on page 12 • "Viewing and updating the database" on page 14 • Messages: FABZ044W, FABZ106E, FABZ107E	PH45271

SC19-2916-03 (April 2021)

Description	Related APARs
Support for IMS 15	N/A
Documentation updates. The following topics have been added or updated: • "Supported databases" on page 5 • "Overview of batch IMS Database Repair Facility for VSAM" on page 45 • "CNV control statement" on page 51 • "Example 7: Control statements to repair a VSAM LDS data set" on page 58 • Message "FABZ0003W" on page 72	N/A

SC19-2916-02 (January 2018)

Description	Related APARs
Support for IMS 14. IMS 14 supports 8 GB OSAM data sets for HALDBs. IMS Database Repair Facility has been enhanced to support IMS 14 and 8GB OSAM data sets for HALDBs.	PI27564

SC19-2916-01

Description	Related APARs
ILK Repair utility support. The ILK Repair utility helps you repair HALDB databases that have corrupted HALDB partition reorganization numbers, duplicate indirect list keys (ILKs), and potentially duplicate ILKs. For more information, see Chapter 5, "Repairing HALDB databases by using the ILK Repair utility," on page 67.	PM97585
Support for IMS 12 and IMS 13.	PM25552, PM78910
Support for OSAM data sets allocated on EAV. You can repair OSAM data sets that are allocated on an extended address volume (EAV). **Note:** VSAM data sets that are allocated on an EAV are supported by default.	PM52886
Support for 4 - 8 GB OSAM data sets. You can repair blocks that are beyond 4 GB in OSAM data sets whose size is larger than 4 GB. Changes are made to the following topics: • For interactive mode, "Viewing and updating an HD or DEDB database" on page 16 • For batch mode, "ORBA control statement" on page 63	PM18995

SC19-2916-00

Description	Related APARs
CHECK control statement for batch mode. You can use the new CHECK control statement to check whether the syntax of the control statements is correct and the values that are specified on the control statements, such as keys or RBAs, are valid. When the CHECK control statement is specified, IMS Database Repair Facility does not update data sets. For more information, see the following topics: • For VSAM data sets, "CHECK control statement" on page 53. • For OSAM data sets, "CHECK control statement" on page 65.	N/A
Prevent changes to data beyond EOF in interactive mode. In interactive mode, IMS Database Repair Facility prevents changes to data that is positioned beyond the end of file (EOF) of the data set.	N/A

IMS Database Repair Facility features and benefits

IMS Database Repair Facility helps you view and change IMS databases. It can be run in interactive or batch mode.

When you run IMS Database Repair Facility in interactive mode, you can accomplish the following tasks:

- Repair database pointers and data.
- Navigate around the database to look for additional problems to verify that no additional repairs are needed.
- Undo recent changes.
- Save time when you repair pointers and data in your IMS databases that use VSAM and OSAM access methods. You can fix only the piece of data in error, rather than forcing you to back out the entire batch of changes that included the bad data.
- Interactively step through your database to look for additional incorrect pointers or data, which provides more reliability.

- Save time and prevent further errors by using the backout capabilities if an incorrect change was made while you use IMS Database Repair Facility.

When you run IMS Database Repair Facility in batch mode, you can accomplish the following tasks:

- Repair both IMS and non-IMS VSAM and OSAM data set pointers and data.
- Verify data before IMS Database Repair Facility modifies it, thus preventing the inadvertent modification of the wrong data.
- Produce a Control Statements and Messages report that documents changes you make.
- Repair VSAM data sets, thus saving you time.

By using the ILK Repair utility together with the HD Pointer Checker utility of IMS HP Pointer Checker, you can repair corrupted HALDB partition reorganization numbers, duplicate ILKs, and potentially duplicate ILKs in HALDB databases. All the databases that are logically related and PSINDEX databases are also repaired.

Examples of IMS Database Repair Facility usage

The following examples illustrate how IMS Database Repair Facility is used in real life situations.

Scenario 1: Changing a pointer

Your installation experiences a power failure. Afterward, you encounter an abend while you use the IMS database. The Pointer Checker utility shows that one of your pointers is invalid. From the Pointer Checker reports, you determine the correct value of the pointer.

You can fix this problem easily with IMS Database Repair Facility. You no longer need to restore the entire database from a backup that was made before the power failure.

Instead, take the database offline, run IMS Database Repair Facility, and correct the pointer in error.

Scenario 2: Repairing data

You realize that an incorrect social security number was specified while you enter data. You could back out the entire batch of data, but it is easier and quicker to simply change the incorrect social security number.

You can do this task with IMS Database Repair Facility. Using key data, locate the incorrect social security number and make the change.

Scenario 3: Repairing duplicate ILKs in HALDB databases

After checking databases with the HD Pointer Checker utility of IMS HP Pointer Checker, you identified corrupted HALDB partition reorganization numbers, duplicate ILKs, and potentially duplicate ILKs in your HALDB databases. Such errors cannot be corrected with the standard IMS recovery methods or by database reorganization. Because such errors can cause data loss, you want to repair the databases as soon as possible.

You can fix such errors by using the HD Pointer Checker utility and the ILK Repair utility. The HD Pointer Checker utility generates repair information records that you use as input to the ILK Repair utility. All the databases that are logically related and PSINDEX databases are also repaired.

Hardware and software requirements

Verify that your hardware and software meet or exceed the minimum requirements.

Hardware requirements

IMS Database Repair Facility runs on any hardware configuration that supports the required versions of IMS.

Software requirements

IMS Database Repair Facility operates on z/OS 2.3 (5650-zOS) or later.

IMS Database Repair Facility requires one of the currently supported versions of IMS.

If you want to compile and then run the product's REXX EXEC programs, the following products are required:

- IBM Compiler for REXX on zSeries
- IBM Library for REXX on zSeries

To use IMS Database Repair Facility in interactive mode when the IMS management of ACBs is enabled, IBM IMS Tools Base for z/OS 1.6 or later must be installed.

Installation of IMS Database Repair Facility is supported by SMP/E.

Supported databases

IMS Database Repair Facility supports various database organization types.

Interactive mode

IMS Database Repair Facility, when run interactively, supports the following databases:

- Hierarchical Direct (HDAM), Hierarchical Indexed Direct (HIDAM) and Hierarchical Indexed Sequential (HISAM) databases that use VSAM or OSAM access methods
- HALDB partitioned hierarchical direct (PHDAM), partitioned hierarchical index direct (PHIDAM) and partitioned secondary index (PSINDEX) databases that use VSAM or OSAM access methods
- Non-partitioned HIDAM index and secondary index databases
- Fast Path DEDBs. The DEDB data sets can be defined in your dynamic allocation library or in the RECON data sets by using the INIT.DBDS and INIT.ADS records.

The following databases are not supported:

- HALDBs whose HALDB online reorganization (OLR) cursor is active. The OLR cursor is active when HALDBs have HALDB online reorganization (OLR) in progress or OLR suspended.
- HALDB partitions that are marked as disabled in the RECON data sets.
- Fast Path secondary index databases and Fast Path DEDBs with Fast Path secondary index databases.
- IMS catalog database that is not registered to the DBRC RECON data sets.
- When the IMS management of ACBs is enabled, IMS catalog database that has an alias name other than DFSC assigned.
- Encrypted OSAM databases.

Batch mode

IMS Database Repair Facility, when run in batch mode, supports the following files and databases:

- Hierarchical Direct (HDAM), Hierarchical Indexed Direct (HIDAM) and Hierarchical Indexed Sequential (HISAM) databases that use VSAM access methods
- HALDB partitioned hierarchical direct (PHDAM) and partitioned hierarchical index direct (PHIDAM) databases that use VSAM access methods
- Non-partitioned HIDAM index and secondary index databases
- VSAM files

ILK Repair utility

The ILK Repair utility supports HALDB partitioned hierarchical direct (PHDAM) databases, partitioned hierarchical index direct (PHIDAM) databases, and partitioned secondary index (PSINDEX) databases that use VSAM or OSAM access methods.

Compatibility with IMS Database Repair Facility 1.2

JCL statements, procedures, and input control statements that you have been using in IBM IMS Database Repair Facility for z/OS 1.2 can be used with IMS Database Repair Facility that is provided in IMS HP Pointer Checker, IMS Database Solution Pack, IMS Database Utility Solution, and IMS Fast Path Solution Pack.

Restrictions of IMS Database Repair Facility

The following restrictions apply to using IMS Database Repair Facility.

Compressed data

In interactive mode, IMS Database Repair Facility does not support the repair of compressed data.

In batch mode, the following restrictions apply when the data set is a compressed data set:

- You cannot perform any IMS Database Repair Facility function by using the relative byte address of the control interval on the CNV control statement.
- You cannot perform the Replace function by using the relative byte address of the VSAM record on the RBA control statement.

Note: You can perform all batch IMS Database Repair Facility functions (verify, replace, and dump) by using the fully qualified key of the VSAM record on the KEY control statement.

IMSplex

IMSplex is supported only by using the DSPSCIX0 exit in the RESLIB.

Service updates and support information

Service updates and support information for this product, including software fix packs, PTFs, frequently asked questions (FAQs), technical notes, troubleshooting information, and downloads, are available from the web.

To find service updates and support information, see the following website:

- IBM Support: IMS Database Solution Pack for z/OS
- IBM Support: IMS Database Utility Solution for z/OS
- IBM Support: IMS Fast Path Solution Pack for z/OS
- IBM Support: IMS High Performance Pointer Checker for z/OS

Product documentation and updates

IMS Tools information is available at multiple places on the web. You can receive updates to IMS Tools information automatically by registering with the IBM My Notifications service.

Information on the web

Always refer to the IMS Tools Product Documentation web page for complete product documentation resources:

https://www.ibm.com/support/pages/node/712955

The IMS Tools Product Documentation web page includes:

- Links to IBM Documentation for the user guides ("HTML")
- PDF versions of the user guides ("PDF")
- Program Directories for IMS Tools products
- Recent updates to the user guides, referred to as "Tech docs" ("See updates to this information!")
- Technical notes from IBM Software Support, referred to as "Tech notes"
- White papers that describe product business scenarios and solutions

IBM Redbooks® publications that cover IMS Tools are available from the following web page:

http://www.redbooks.ibm.com

The IBM Information Management System website shows how IT organizations can maximize their investment in IMS databases while staying ahead of today's top data management challenges:

https://www.ibm.com/software/data/ims/

Receiving documentation updates automatically

To automatically receive emails that notify you when new technote documents are released, when existing product documentation is updated, and when new product documentation is available, you can register with the IBM My Notifications service. You can customize the service so that you receive information about only those IBM products that you specify.

To register with the My Notifications service:

1. Go to http://www.ibm.com/support/mysupport
2. Enter your IBM ID and password, or create one by clicking **register now**.
3. When the My Notifications page is displayed, click **Subscribe** to select those products that you want to receive information updates about. The IMS Tools option is located under **Software** > **Information Management**.
4. Click **Continue** to specify the types of updates that you want to receive.
5. Click **Submit** to save your profile.

How to send your comments

Your feedback is important in helping us provide the most accurate and highest quality information. If you have any comments about this or any other IMS Tools information, you can take one of the following actions:

- Click the Feedback button at the top of the IBM Documentation topic that you are commenting on.
- Click the Contact Us tab at the bottom of any IBM Documentation topic.
- Send an email to ibmdocs@us.ibm.com. Be sure to include the book title, topic or section title, specific text, and your comment.

To help us respond quickly and accurately, please include as much information as you can about the content you are commenting on, where we can find it, and what your suggestions for improvement might be.

Accessibility features

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use a software product successfully.

The major accessibility feature of the product is the keyboard-only operation for ISPF editors. It uses the standard TSO/ISPF interface.

You can access the information center and IMS ISPF panel functions by using a keyboard or keyboard shortcut keys.

For information about navigating the IMS ISPF panels using TSO/E or ISPF, refer to the following publications for information about accessing ISPF interfaces:

- *z/OS ISPF User's Guide, Volume 1*
- *z/OS TSO/E Primer*
- *z/OS TSO/E User's Guide*

These guides describe how to use ISPF, including the use of keyboard shortcuts or function keys (PF keys), include the default settings for the PF keys, and explain how to modify their functions.

Chapter 2. Repairing IMS databases in interactive mode

You can run IMS Database Repair Facility interactively or in batch mode. The following topics describe interactive operation.

In the following topics, the term IMS Database Repair Facility refers to IMS Database Repair Facility running interactively.

IMS Database Repair Facility is an interactive, easy-to-use program that is run under TSO. It is panel driven, and to change your database's pointers and data, simply enter the required information in the panel.

Topics:

- "Preparing to run IMS Database Repair Facility" on page 9
- "Starting IMS Database Repair Facility" on page 10
- "Selecting a task from the Main menu" on page 11
- "Setting up IMS environment" on page 12
- "Viewing and updating the database" on page 14
- "Undoing changes" on page 38
- "Viewing audit history of processed segments" on page 41
- "Saving changes in batch format" on page 43

Preparing to run IMS Database Repair Facility

To run IMS Database Repair Facility, you need exclusive control of the database. To minimize the time you need the database, have all the necessary information, such as Pointer Checker reports and key information, assembled before you begin.

Procedure

- Gather the following information:
  - To start IMS Database Repair Facility, you must know the high-level qualifier of the product's SMP/E target data sets. If you do not know the qualifier, speak to the person who installed IMS Database Repair Facility.
  - You must know the names of the RESLIB, randomizer load library, and DBD library. If the IMS management of ACBs is enabled, you must know the high-level qualifier of the IMS bootstrap data set and the name of IMS Tools Base library (SGLXLOAD) instead of the DBD library.

    If your database is non-partitioned, you must also know the name of the dynamic allocate library or the name of the optional data set or PDS member that contains the appropriate list of DD names and data set names. These names must be associated with the selected database if the database is not contained in the dynamic allocation library.
  - If you suspect a pointer error, run the Pointer Checker utility to find the bad pointer and what its correct value should be.
  - If you want to fix a data error, have the correct key and data values on hand.
- Only one person at a time can run IMS Database Repair Facility against the database. Ensure that no one is using IMS Database Repair Facility.

Starting IMS Database Repair Facility

After you confirm that no one is using the database, start IMS Database Repair Facility.

Procedure

To start IMS Database Repair Facility, issue one of the following commands from the PDF Option 6 **TSO command** panel:

- If the REXX procedure library is concatenated with either the TSO SYSPROC or SYSEXEC DD statement, enter:

  ```
  FABZMAIN smphlq workhlq csvol fdebug
  ```

- If the REXX procedure library is not concatenated, enter:

  ```
  EX 'smphlq.SFABCLIB(FABZMAIN)' 'smphlq workhlq csvol fdebug'
  ```

Where:

smphlq
Is the high-level qualifier of the SMP/E target data sets.

workhlq
Is an optional high-level qualifier for work data sets.

csvol
Is an optional parameter that specifies the volume serial of a DASD device to be used by IMS Database Repair Facility data sets (for non-SMS sites only).

fdebug
Is an optional parameter for trace. Set it to 1 to enable tracing; leave it blank to disable tracing. Tracing dumps information directly to your screen, which gives you the results immediately.

If you want to report a problem to IBM, run IMS Database Repair Facility under a special trace EXEC, described in "Generating a trace file" on page 97. Output from the trace EXEC is written to a file that you can submit as part of your problem documentation.

When one of the optional parameters is omitted, but subsequent ones appear, an asterisk (*) is used as a placeholder. The following examples illustrate what happens when these parameters are specified or omitted.

Examples

- Both *workhlq* and *csvol* are specified but *fdebug* is not:

  ```
  EX 'smphlq.SFABCLIB(FABZMAIN)' 'smphlq ZZZ SYS666'
  ```

  The work data set names default to ZZZ.*userid.xxx*, and the data set allocation uses UNIT=SYS666. No tracing takes place.

- Only *csvol* and *fdebug* are specified:

  ```
  EX 'smphlq.SFABCLIB(FABZMAIN)' 'smphlq * SYS123 1'
  ```

  The work data set names default to *userid.xxx*, the data set allocation uses UNIT=SYS123, and tracing takes place to your screen.

- None of the parameters, *workhlq*, *csvol*, and *fdebug* are specified:

  ```
  EX 'smphlq.SFABCLIB(FABZMAIN)' 'smphlq'
  ```

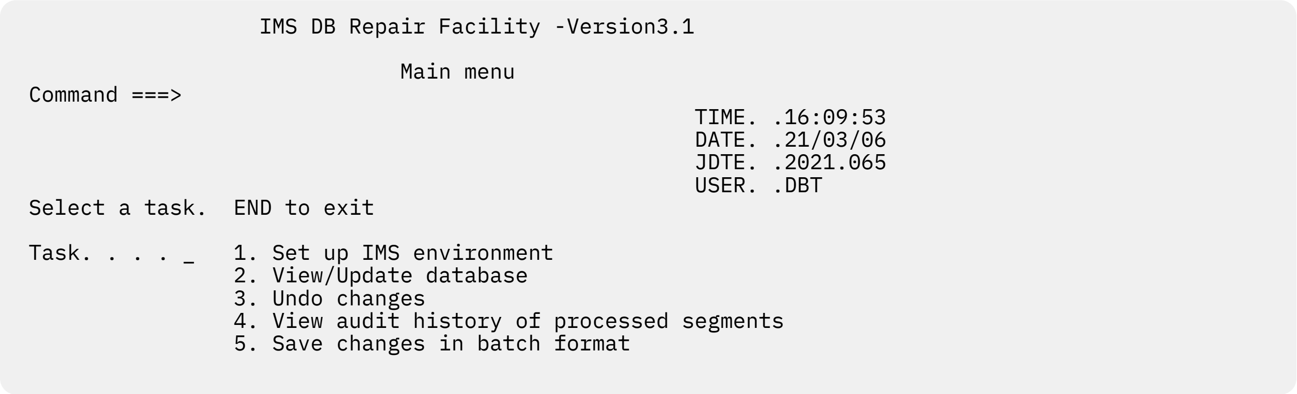
  In this case, the work data set names default to *userid.xxx*, and the data set allocation uses UNIT=SYSDA. Tracing does not take place. Asterisks are not needed to represent the trailing optional parameters.

Selecting a task from the Main menu

The first panel that displays when you start IMS Database Repair Facility is the **Main menu**. You set up and run IMS Database Repair Facility from this panel.

Procedure

In the **Main menu**, select the task that you want to accomplish.



```
                    IMS DB Repair Facility -Version3.1

                               Main menu
Command ===>
                                                    TIME. .16:09:53
                                                    DATE. .21/03/06
                                                    JDTE. .2021.065
                                                    USER. .DBT
Select a task.  END to exit

Task. . . . _   1. Set up IMS environment
                2. View/Update database
                3. Undo changes
                4. View audit history of processed segments
                5. Save changes in batch format
```

Figure 1. Main menu

1. Set up IMS environment

Use this option to specify the IMS ID and the names of the appropriate libraries. You must select this option the first time you run IMS Database Repair Facility. As part of the setup IMS environment option, specify the DBD library or, if the IMS management of ACBs is enabled, the high-level qualifier of the IMS bootstrap data set, and the optional dynamic allocation library that contain the database you want to process.

For instructions, see "Setting up IMS environment" on page 12.

2. View/Update database

Select this option to view or modify the contents of a database. You must specify the database name and enter more information about the segment or block before you can view or modify the database.

For instructions, see "Viewing and updating the database" on page 14.

Important: Immediately after you make changes, always run the Pointer Checker utility to verify that any changes you made to pointers are valid. If you find that there is an error, restart IMS Database Repair Facility and undo the erroneous update (option **3. Undo changes**). The undo must be done promptly because selecting option **2. View/Update database** again causes the History and Undo files that are associated with a database to reinitialize so that they track information only from the current run.

3. Undo changes

Select this option to undo changes that you made.

For instructions, see "Undoing changes" on page 38.

Important: If you have just used IMS Database Repair Facility and want to undo a change, select this option immediately. If you select option **2. View/Update database**, the Undo and History files are reallocated, making it impossible to undo the changes.

4. View audit history of processed segments

This option provides a list of the segments you went through while you used IMS Database Repair Facility. Use this trace to refresh your memory on how you navigated through the database.

For instructions, see "Viewing audit history of processed segments" on page 41.

5. Save changes in batch format

Select this option to save the current changes in a file. The file contains JCL records that can be inserted into either the VSAM batch job or OSAM batch job of IMS Database Repair Facility. You can use this file if you want to apply the same changes to a copy of the database.

For instructions, see "Saving changes in batch format" on page 43.

Tips:

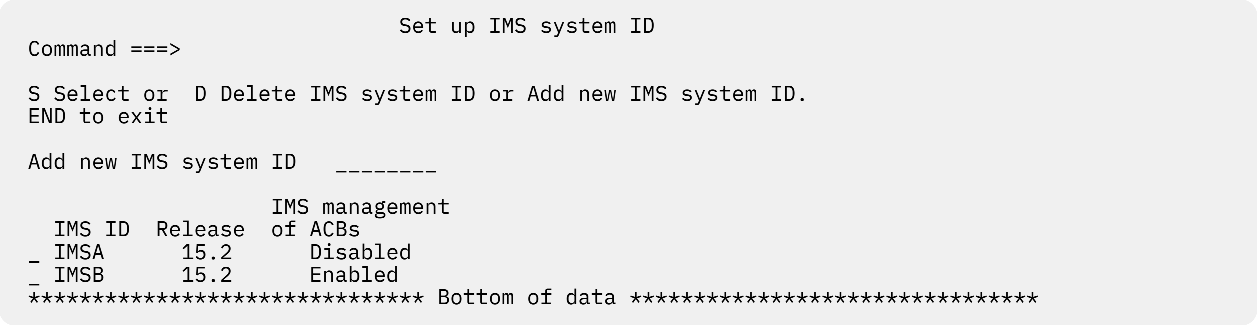
- For information about fields in each panel, press PF1 to view the embedded help.
- When you make a selection, you might receive an informational or error message. This message can partly obscure the panel. To see the panel without the message, use PF7 or PF8. These function keys clear the message but cause `Up is not active` or `Down is not active` to display in the upper right corner. You can ignore these messages. Depending on the nature of the message, pressing Enter also refreshes the panel.

Setting up IMS environment

Select option **1. Set up IMS environment** to specify your IMS system ID and the libraries that are used by IMS Database Repair Facility to access your database.

Procedure

1. Select option **1. Set up IMS environment** in the **Main menu** and press Enter.
2. In the **Set up IMS system ID** panel, specify an IMS system ID in the **Add new IMS system ID** field. If the IMS system ID that you want to work with is already defined, select the IMS system ID by entering an S in the input field that corresponds to that IMS system ID. Then, press Enter.

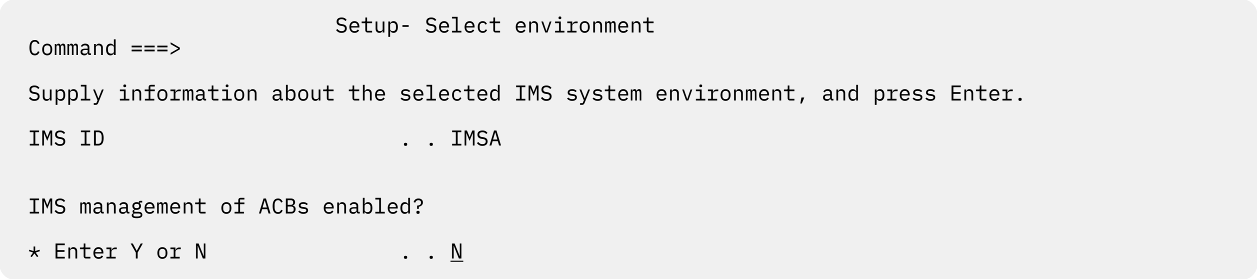


```
                             Set up IMS system ID
Command ===>

S Select or  D Delete IMS system ID or Add new IMS system ID.
END to exit

Add new IMS system ID   ________

                   IMS management
  IMS ID  Release  of ACBs
_ IMSA      15.2      Disabled
_ IMSB      15.2      Enabled
******************************* Bottom of data ********************************
```

Figure 2. Set up IMS system ID panel

Tip: You can also delete an IMS system ID by entering a D in the input field that corresponds to the IMS system ID that you want to remove from this panel. You can delete multiple IMS system IDs at once.

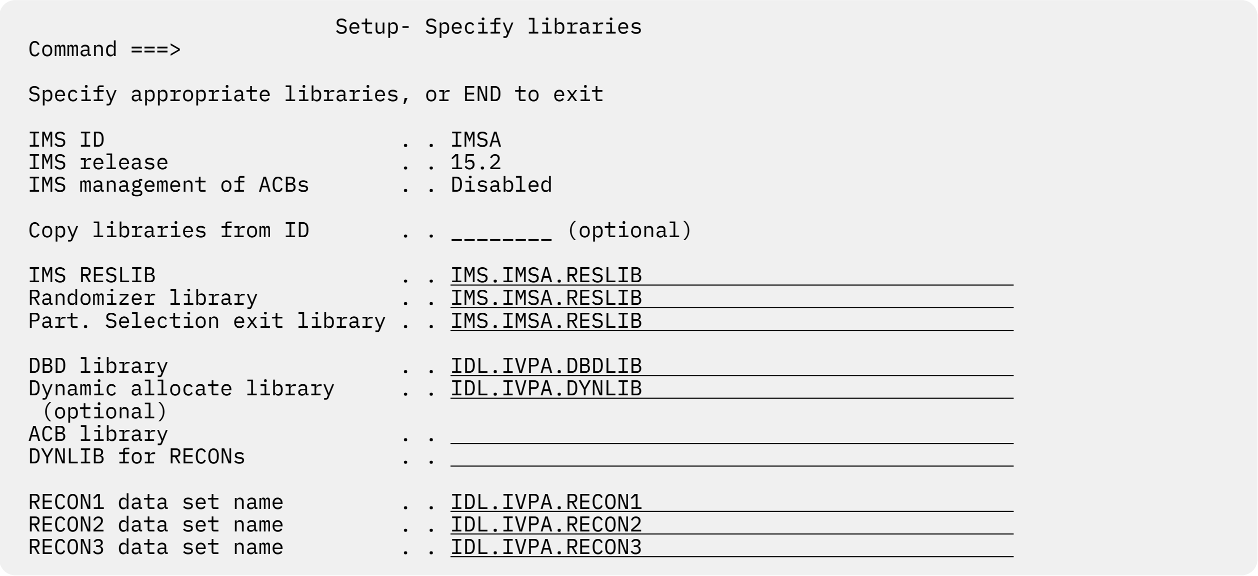
3. In the **Setup- Select environment** panel, supply information whether the IMS management of ACBs is enabled or not in the selected IMS system environment. If the IMS management of ACBs is enabled in the IMS system, enter Y. If the IMS management of ACBs is not enabled or if you want to use DBD and ACB libraries with IMS Database Repair Facility, enter N.



```
                        Setup- Select environment
Command ===>

Supply information about the selected IMS system environment, and press Enter.

IMS ID                        . . IMSA


IMS management of ACBs enabled?

* Enter Y or N                . . N
```

Figure 3. Setup- Select environment panel

4. In the **Setup- Specify libraries** panel, specify the libraries to be used by IMS Database Repair Facility to access your database.



```
                        Setup- Specify libraries
Command ===>

Specify appropriate libraries, or END to exit

IMS ID                       . . IMSA
IMS release                  . . 15.2
IMS management of ACBs       . . Disabled

Copy libraries from ID       . . ________ (optional)

IMS RESLIB                   . . IMS.IMSA.RESLIB
Randomizer library           . . IMS.IMSA.RESLIB
Part. Selection exit library . . IMS.IMSA.RESLIB

DBD library                  . . IDL.IVPA.DBDLIB
Dynamic allocate library     . . IDL.IVPA.DYNLIB
 (optional)
ACB library                  . . ____________________________________________
DYNLIB for RECONs            . . ____________________________________________

RECON1 data set name         . . IDL.IVPA.RECON1
RECON2 data set name         . . IDL.IVPA.RECON2
RECON3 data set name         . . IDL.IVPA.RECON3
```

Figure 4. Setup- Specify libraries panel (when the IMS management of ACBs is disabled)

Provide the library information in the following fields:

Copy libraries from ID
If an IMS system ID is already defined and you want to use the same libraries or some of the libraries that are defined to that IMS system ID, specify the IMS system ID in this field and then press Enter. The fields are populated with the libraries that are defined to the specified IMS system ID. If necessary, update the populated library names.

IMS RESLIB
Specify the name of the IMS RESLIB.

Randomizer library
Specify the name of the library that contains the randomizing modules.

If you leave the field blank and press Enter, the library name that is specified in the **IMS RESLIB** field is populated in this field.

Part. Selection exit library
Specify the name of the library that contains the HALDB partition selection exit routine.

DBD library
Specify the name of the DBD library. Specify this field only if the IMS management of ACBs is not enabled.

IMS bootstrap data set HLQ
Specify the high-level qualifier of the IMS bootstrap data set (BSDS), which is one of the system data sets of the IMS catalog. Specify this field only if the IMS management of ACBs is enabled.

IMS Tools Base library (SGLXLOAD)
Specify the SGLXLOAD library of IMS Tools Base. Specify this field only if the IMS management of ACBs is enabled.

Dynamic allocate library
If your database data set names are stored in a dynamic allocation library, enter the name of the library.

This field is optional, but if left blank for a non-partitioned database or a DEDB, you must later supply the name of the dynamic allocate library or a list of database data set names in the **Update libraries** panel.

ACB library

If you want to modify a Fast Path DEDB and want to view the segment by key, specify the name of the ACB library that contains the DBD definition. Specify this field only if the IMS management of ACBs is not enabled.

The DBD must be defined in the DBDLIB and the ACBLIB. Specify the ACB library only if you plan to modify a Fast Path DEDB.

DYNLIB for RECONs

If RECON dynamic allocation members are not in the RESLIB or the dynamic allocation library, specify the library where they can be found.

RECON data set names

Specify the RECON data set names.

If you leave the fields blank and press Enter, IMS Database Repair Facility generates RECON data set names based on the dynamic allocation members that are found in RESLIB or DYNLIB. You can accept or modify the displayed names. If none were found, the fields are blank and you must manually enter the names of the RECON data sets.

The library names that you specify on this panel initially become the defaults for the entire IMS Database Repair Facility. You can overwrite these defaults later on the **Update libraries** panel.

5. Press Enter. The **Set up IMS system ID** panel is displayed again. Press END (PF3) to return to the **Main menu**.

Viewing and updating the database

Select option **2. View/Update database** to view or update a database.

Before you begin

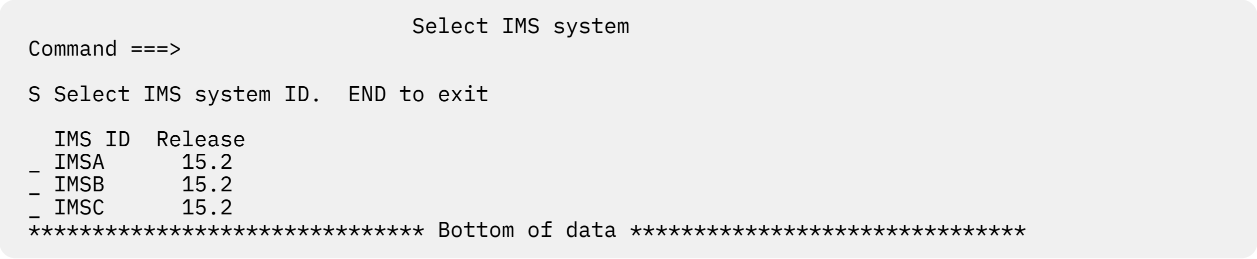
The IMS system ID that you want to work with must be defined to IMS Database Repair Facility. Complete the steps in "Setting up IMS environment" on page 12 to define the IMS system ID.

About this task

Before you can make changes to the data and pointers, you must provide information that identifies the initial segment or record that you want to display, and then specify the format in which you want the data displayed.

Procedure

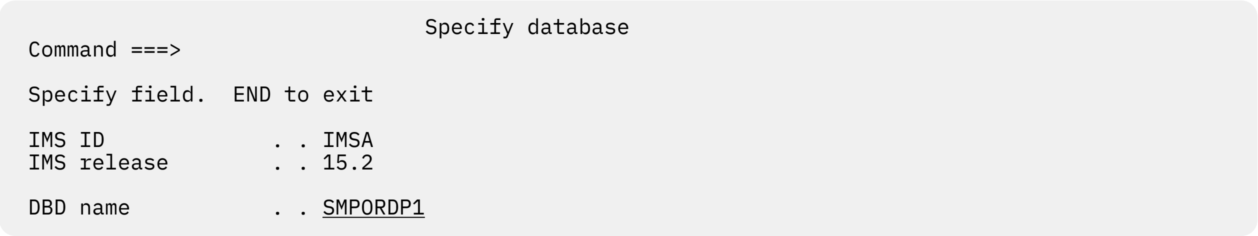
1. Select option **2. View/Update database** in the **Main menu** and press Enter.
2. In the **Select IMS system** panel, select the IMS system ID that you want to work with by entering an S in the input field that corresponds to the IMS system ID. Then, press Enter.



```
                              Select IMS system
Command ===>

S Select IMS system ID.  END to exit

  IMS ID  Release
_ IMSA      15.2
_ IMSB      15.2
_ IMSC      15.2
******************************* Bottom of data *******************************
```

Figure 5. Select IMS system panel

3. In the **Specify database** panel, specify the database name or, for a partitioned database, the master DBD name in the **DBD name** field. Then, press Enter.



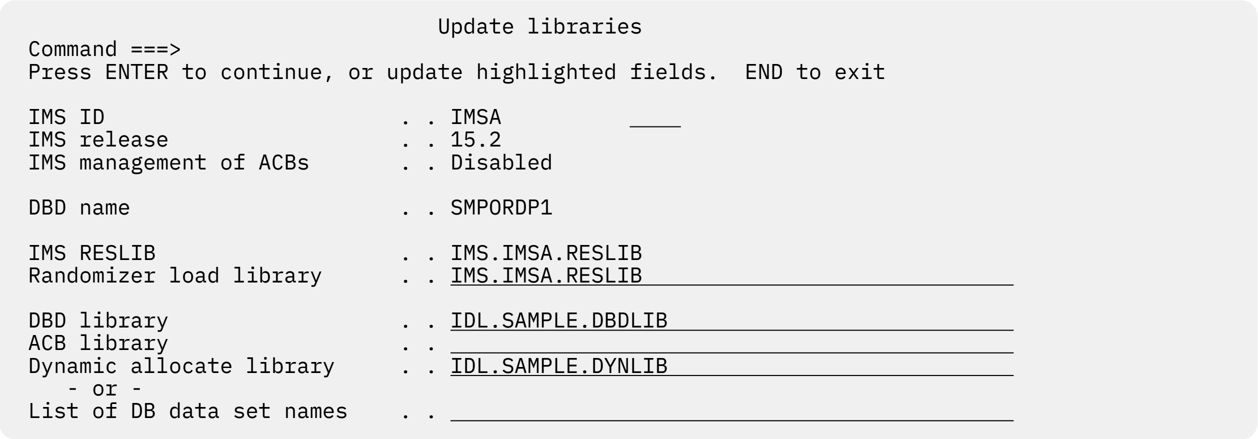
```
                              Specify database
Command ===>

Specify field.  END to exit

IMS ID            . . IMSA
IMS release       . . 15.2

DBD name          . . SMPORDP1
```

Figure 6. Specify database panel

IMS Database Repair Facility determines the database organization type and the access method that is associated with this database. This information determines which panel is displayed next. Typically, the **Update libraries** panel is displayed.

4. In the **Update libraries** panel, examine the libraries and, if necessary, update the libraries. Then, press Enter.

   The library names that are displayed on the **Update libraries** are the names that you specified on the **Setup- Specify libraries** panel. If you change the library names on the **Update libraries** panel, the new names become the default library names for this database until you modify them again.



```
                               Update libraries
Command ===>
Press ENTER to continue, or update highlighted fields.  END to exit

IMS ID                      . . IMSA          ____
IMS release                 . . 15.2
IMS management of ACBs      . . Disabled

DBD name                    . . SMPORDP1

IMS RESLIB                  . . IMS.IMSA.RESLIB
Randomizer load library     . . IMS.IMSA.RESLIB____________________________

DBD library                 . . IDL.SAMPLE.DBDLIB__________________________
ACB library                 . . ____________________________________________
Dynamic allocate library    . . IDL.SAMPLE.DYNLIB__________________________
   - or -
List of DB data set names   . . ____________________________________________
```

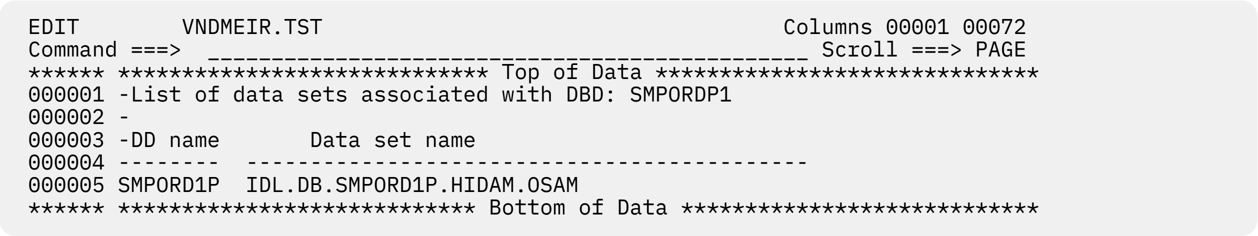
Figure 7. Update libraries panel (when IMS management of ACBs is disabled)

The **Dynamic allocate library** field and the **List of DB data set names** field are displayed only for a non-partitioned database. These fields are mutually exclusive; if you use one field, you must leave the other field blank.

If the database is not contained in the dynamic allocation library, you can specify the name of a data set or a PDS member that contains a list of DD names and the data set names that are associated with the database in the **List of DB data set names** field. If you specify this field and press Enter, the **TSO edit** panel is displayed.

If the data set or PDS member was defined and the list is in the required format, IMS Database Repair Facility displays the contents. If the format is incorrect, IMS Database Repair Facility deletes the contents and formats the data set or member. If this data set or PDS member does not exist, IMS Database Repair Facility allocates or creates it and formats it.

In the **TSO edit** panel, enter or modify the data as needed. Then, press END (PF3).



```
EDIT        VNDMEIR.TST                                   Columns 00001 00072
Command ===>  ______________________________________________ Scroll ===> PAGE
****** ***************************** Top of Data ******************************
000001 -List of data sets associated with DBD: SMPORDP1
000002 -
000003 -DD name       Data set name
000004 --------  --------------------------------------------
000005 SMPORD1P  IDL.DB.SMPORD1P.HIDAM.OSAM
****** **************************** Bottom of Data ****************************
```

Figure 8. TSO edit panel

5. The **Initial selection** panel is displayed. Continue with either of the following steps:
   - "Viewing and updating an HD or DEDB database" on page 16
   - "Viewing and updating a HISAM, SHISAM, INDEX, secondary index (SINDEX), or partitioned secondary index (PSINDEX) database" on page 33

Viewing and updating an HD or DEDB database

In the **Initial selection** panel, enter additional information to identify the segment that you want to display.

Before you begin

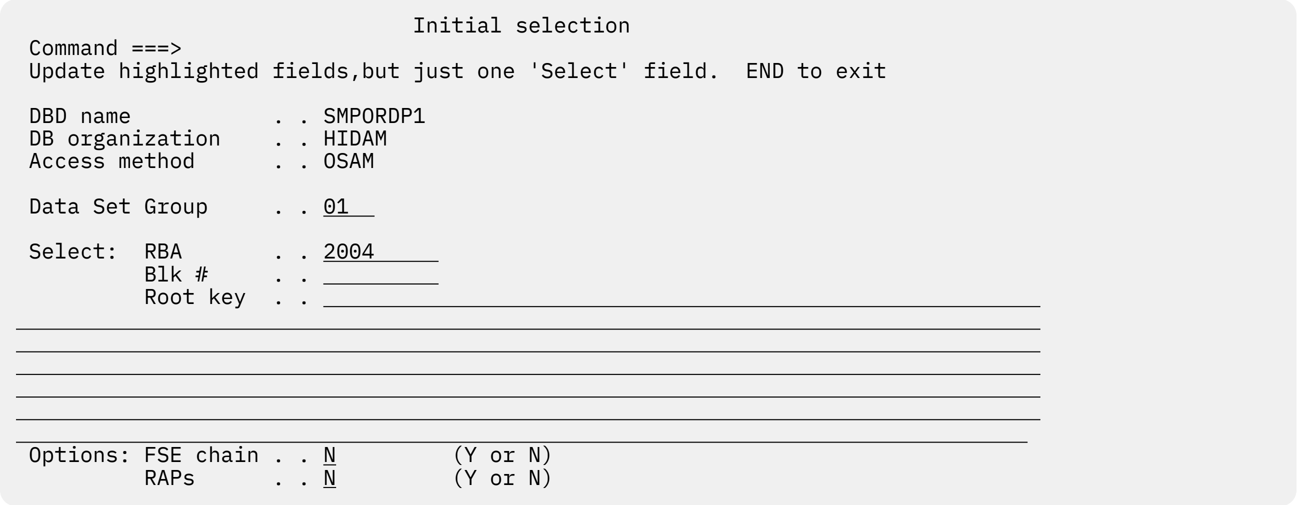
For DEDB users: On the **Initial selection** panel, you specify the DEDB area where you want to work. An area can have one or more area data sets, called multiple area data sets (MADS). An individual area data set is referred to as ADS.

Any subsequent panel that is a view of a DEDB area displays the first available ADS for that area. *Available* refers to the status of the ADS in the RECON data sets. Any panel where you can change the data of an ADS attempts to propagate such a change to all the available ADS for that area. This propagation can fail on some ADS. MADS are possibly available, but not necessarily in sync with each other, as IMS does tolerate a finite number of read/write errors on ADS. Such a failure does not abort the process of propagating the change to all available ADS.

When you change an ADS, the change is recorded. You can reverse this change by starting the Undo function. When you perform an undo, IMS Database Repair Facility attempts to propagate the undo to all available ADS for this area.

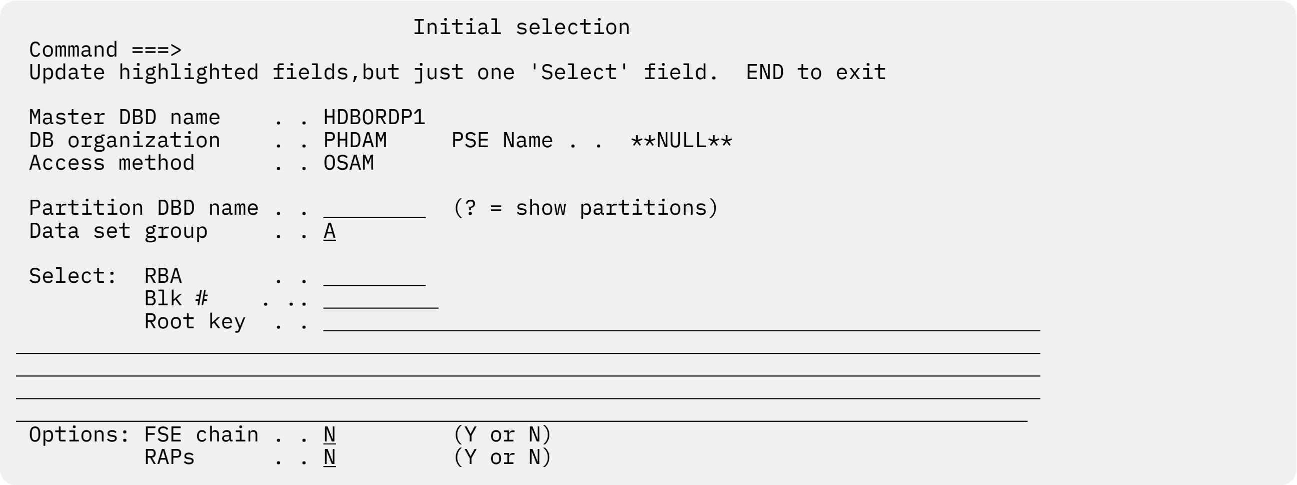
Procedure

The **Initial selection** panel differs by database organization type.



```
                              Initial selection
 Command ===>
 Update highlighted fields,but just one 'Select' field.  END to exit

 DBD name           . . SMPORDP1
 DB organization    . . HIDAM
 Access method      . . OSAM

 Data Set Group     . . 01__

 Select:  RBA       . . 2004_____
          Blk #     . . _________
          Root key  . . ________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
_______________________________________________________________________________
 Options: FSE chain . . N          (Y or N)
          RAPs      . . N          (Y or N)
```

Figure 9. Initial selection panel for HDAM, HIDAM, and DEDB databases



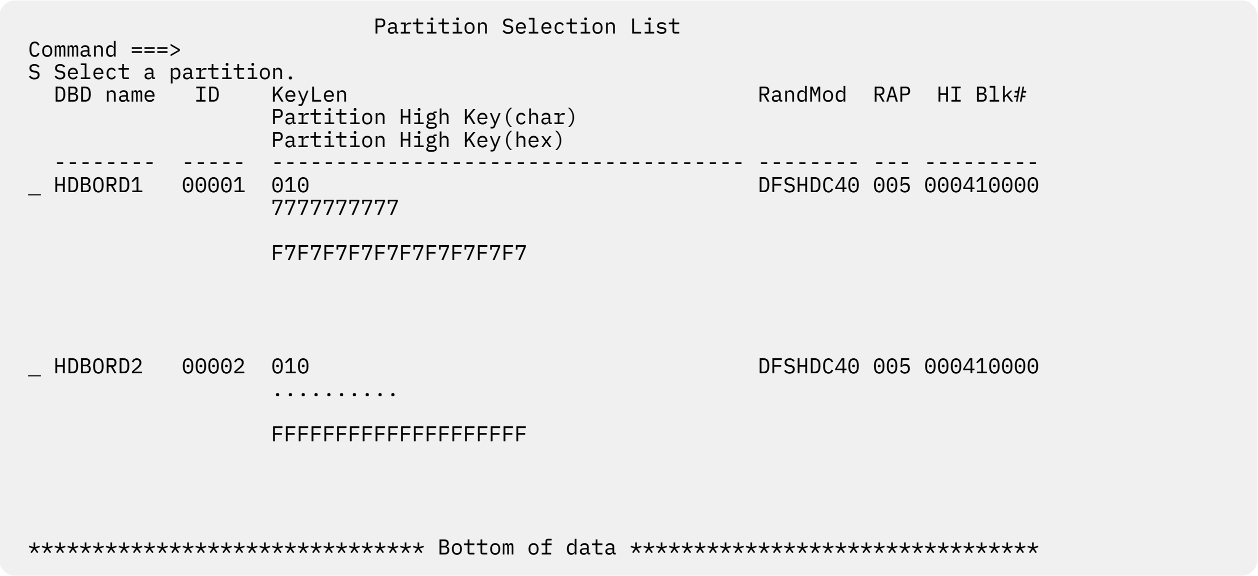
```
                              Initial selection
Command ===>
Update highlighted fields,but just one 'Select' field.  END to exit

Master DBD name    . . HDBORDP1
DB organization    . . PHDAM     PSE Name . .  **NULL**
Access method      . . OSAM

Partition DBD name . . ________  (? = show partitions)
Data set group     . . A

Select:  RBA       . . ________
         Blk #    . .. _________
         Root key  . . ________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
_______________________________________________________________________________
Options: FSE chain . . N         (Y or N)
         RAPs      . . N         (Y or N)
```

Figure 10. Initial selection panel for PHIDAM and PHDAM databases

1. If you are processing a partitioned database and you want to specify an RBA, block number, or CI number, enter the name of the database partition in the **Partition DBD name** field.

   Note: The **PSE Name** field shows the HALDB Partition Selection exit routine.

   You can enter a question mark (?) to display the **Partition Selection List** panel to select the partition. In the **Partition Selection List** panel, a list of database partition names that belong to the master DBD name is shown.

   ```
                              Partition Selection List
   Command ===>
   S Select a partition.
     DBD name   ID    KeyLen                                RandMod  RAP  HI Blk#
                      Partition High Key(char)
                      Partition High Key(hex)
     --------  -----  ------------------------------------ -------- --- ---------
   _ HDBORD1   00001  010                                   DFSHDC40 005 000410000
                      7777777777

                      F7F7F7F7F7F7F7F7F7F7




   _ HDBORD2   00002  010                                   DFSHDC40 005 000410000
                      ..........

                      FFFFFFFFFFFFFFFFFFFF




   ******************************* Bottom of data ********************************
   ```

   Figure 11. Partition Selection List panel

   This panel shows the partition name (**DBD name** field), partition ID, partition high key and its length, randomizing module, number of RAPs per block or CI, and the high block number of the root addressable area.

   The **Partition High Key** field shows the highest value of a root segment key in this partition. If X'FF's is displayed, it indicates that the highest key is the length of the key filled with FFs.

   Select one of the partition names by typing an S in the selection field. Then, press Enter to return to the **Initial selection** panel.

2. Specify the data set group or the area number of the data set that contains the segment that you want to display in the **Data set group** field or the **Area number** field.

   - For an HDAM or HIDAM database, enter the data set group number (1 - 10).

- For a PHDAM and PHIDAM database, enter a value of A through J.
- For a DEDB, enter the area number (1 - 2048).

3. Enter one of the following fields to display the information about a specific segment, block, or CI. The RBA, Blk/CI #, and Root key options are mutually exclusive. If you want to display the free space element (FSE) chain or root anchor points (RAPs) in a specific block or CI, specify the RBA, block, or CI in which the FSE chain or the RAPs exist.

   RBA

   Specify the relative byte address (RBA) used for accessing a database segment. You can access any segment provided that the RBA points to a valid segment code.

   To display an individual segment, the RBA must point to a valid segment code. For any other RBA, IMS Database Repair Facility displays the block that contains that RBA.

   To view the FSE chain or RAPs in a specific block or CI, you must specify an RBA, and that RBA must be within the block or CI.

   If the database is an HDAM or HIDAM and the database data set is OSAM with even block size or if the database is a PHDAM or PHIDAM that is registered in the RECON data sets as a database that supports up to 8 GB of data, the maximum database size can be 8 GB. An RBA beyond 4 GB for the OSAM database data set can be specified in hexadecimal format by the following expressions:

   - A nine-digit value. Add a 1 at the beginning of the RBA value. For example, to specify an RBA value of 4294968320, you enter 100000400. The maximum value is X'1FFFFFFFF'.
   - An eight-digit value. Increment the last bit of the RBA value by 1. For example, to specify an RBA value of 4294968320, you enter 00000401. The maximum value is X'FFFFFFFF'.

   When either of these values is supplied, IMS Database Repair Facility assumes that the value is over 4 GB for the even-block size OSAM.

   Note: A nine-digit RBA is used only when you enter the value. IMS Database Repair Facility shows the RBA value in eight digits.

   BLK # or CI #

   Specify a block number or a CI number. Zero is not a valid number.

   Root key

   Specify the key to use to access a database root segment.

   For a PHDAM and PHIDAM database, if you specify a root key, IMS Database Repair Facility determines the database partition to which it belongs. A message is displayed with this information. If you specify both a partition DBD name and a root key on this panel, the partition DBD name is ignored.

   Certain rules apply to specifying the keys. See “Rules for specifying keys” on page 38.

4. If you want to display the FSE chain or RAPs, specify the **FSE chain** field or the **RAPs** field. The FSE chain and RAPs options are mutually exclusive.

   FSE chain

   Specify Y to display the FSE chain in a block or CI. This option is applicable for HD databases.

   RAPs

   Specify Y to display the RAPs associated with HDAM, PHDAM, or HIDAM database. For HIDAM databases, this option is applicable only when RAPs exist.

   RAPs are present in all blocks (including bitmap blocks), but not in unused blocks (all X'0000' or X'FFFF'). A valid FSE chain is identified by the first 4 bytes of the block, the FSEAP, where the first 2 bytes are nonzero and the second 2 bytes are zero. If you request FSE=Y or RAPS=Y, and IMS Database Repair Facility detects that the requested block (or the block that is associated with the requested RBA) does not have an FSE chain or RAPs, a message is displayed to alert you that this block does not have an FSE chain or RAPs.

5. Press Enter.

   The panel that is displayed next differs by which option you selected:

- If you specify an RBA that points to the beginning of a segment and do not select the FSE chain or the RAPs option, the **Segment Prefix** panel is displayed. See "Viewing and updating segment prefix" on page 19.
- If you specify an RBA, block number, or CI number and you select the FSE chain option, the **Free Space Element Chain** panel is displayed. See "Viewing and updating FSEAP and FSE chain within block or CI" on page 31.
- If you specify an RBA, block number, or CI number and you select the RAPs option, the **RAP Pointers** panel is displayed. See "Viewing and updating RAP pointers within block or CI" on page 32.
- If you specify a block number or CI number, or an RBA that does not point to the beginning of a segment, and do not select the FSE chain or the RAPs option, the **Block/CI data** panel is displayed. See "Viewing and updating block or CI data in the Block/CI data panel" on page 29.
- If you specify a root key, the **Segment Prefix** panel is displayed. See "Viewing and updating segment prefix" on page 19.

Related tasks

Navigating around the database
Use the **Segment Prefix** panel to navigate around the database and to request the display of a segment prefix, segment data, or block in order to zap it.

Viewing and updating segment prefix

Use the **Segment Prefix** panel to update the pointers in the segment prefix, if you think they are in error.

About this task

The **Segment Prefix** panel can be used to update the segment prefix and to navigate through the database. To navigate through the database, see "Navigating around the database" on page 21.

The prefix for each segment contains the pointers that are defined in the DBD. The **Segment Prefix** panel displays these pointers for the segment that you selected on the **Initial selection** panel.

You can update the segment prefix in either of the following two panels:

- In the **Segment Prefix** panel, the prefix is already formatted which makes it easier to update.
- In the **Segment Prefix Dump** panel, the prefix is shown in hexadecimal format. It can include some bytes of the prefix that are not in the formatted version that is shown on the **Segment Prefix** panel.

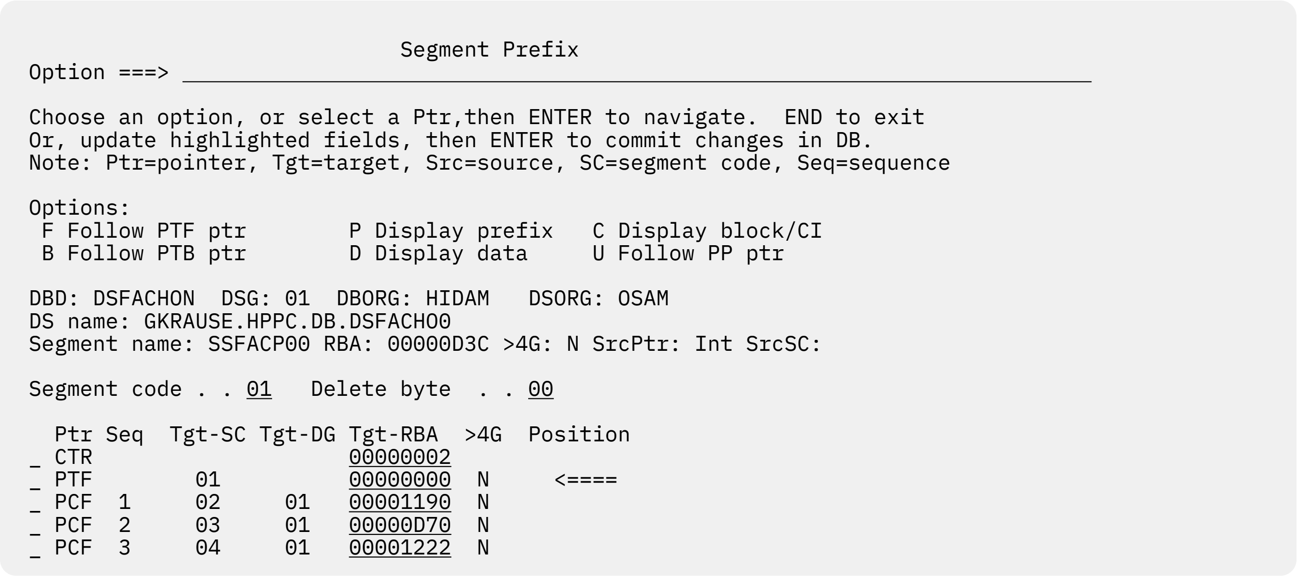
If you are a HALDB user and want to inspect or change prefix data, you might prefer to use the **Segment Prefix Dump** panel. You can switch to **Segment Prefix Dump** panel by selecting option P in the **Segment Prefix** panel. For more information about the **Segment Prefix Dump** panel, see "Viewing and updating segment prefix in the Segment Prefix Dump panel" on page 25.

Procedure

Access this panel from the **Initial selection** panel by specifying an RBA that points to the beginning of a segment (without the FSE chain or the RAPs option) or by specifying a root key.

In the **Segment Prefix** panel, you can modify the segment code, delete byte, and the RBA of the target segment.

The first few lines on this panel provide information that identifies the database, data set, and segment. The lower part of the panel contains a list of pointers. To modify the values, specify the new values in the corresponding fields and press Enter to accept the changes. The panel is displayed again, reflecting your changes.



```
                                 Segment Prefix
Option ===> ________________________________________________________________________

Choose an option, or select a Ptr,then ENTER to navigate.  END to exit
Or, update highlighted fields, then ENTER to commit changes in DB.
Note: Ptr=pointer, Tgt=target, Src=source, SC=segment code, Seq=sequence

Options:
 F Follow PTF ptr        P Display prefix   C Display block/CI
 B Follow PTB ptr        D Display data     U Follow PP ptr

DBD: DSFACHON  DSG: 01  DBORG: HIDAM   DSORG: OSAM
DS name: GKRAUSE.HPPC.DB.DSFACHO0
Segment name: SSFACP00 RBA: 00000D3C >4G: N SrcPtr: Int SrcSC:

Segment code . . 01   Delete byte  . . 00

  Ptr Seq  Tgt-SC Tgt-DG Tgt-RBA  >4G  Position
_ CTR                    00000002
_ PTF        01          00000000  N     <====
_ PCF  1     02     01   00001190  N
_ PCF  2     03     01   00000D70  N
_ PCF  3     04     01   00001222  N
```

Figure 12. Segment Prefix panel

This panel contains the following fields:

DBD
The name of the database, or for a partitioned database, the name of the partition.

DSG
The data set group number or, for a DEDB, the area number.

DBORG
The database organization type.

DSORG
The organization type of the data set.

DS name
The name of the active data set.

Segment
The segment line provides information that is associated with the active segment.

Name
The segment name.

RBA
The relative byte address of the segment.

>4G

N
Indicates that the segment is in the first 4 GB of the database.

Y
Indicates that the segment is in the second 4 GB of an OSAM database.

SrcPtr
How this segment was accessed (PTF, PTB, or PCF pointer). If this segment is the initially selected segment to be displayed (that is, a key or RBA was used to select on the **Initial selection** panel), this field contains the characters INT.

SrcSC
The segment code of the source pointer.

Level
The level of the current segment. Level 0 indicates that this segment is the top of the hierarchy (that is, root segment level), and that it is not possible to go up any further.

Segment code

The current segment code. You can update the segment code to repair a database.

If an invalid segment code is entered, an error message is displayed.

Delete byte

A value of 00 indicates that this segment is an active segment.

Any other value indicates that the delete flag associated with the segment is on. For more information, see *IMS Database Administration* for the IMS version that is installed at your site.

You can update the delete byte to repair a database.

Ptr

The type of IMS pointer. Possible values are PTF, PTB, PCF, PP, or CTR.

Seq

The order that the PCF pointers are defined in the DBD.

Tgt-SC

The segment code of the target segment.

If logical pointers appear on the **Segment Prefix** panel, the **Tgt-SC** and **Tgt-DG** columns are blank.

Tgt-DG

The data set group number of the target data set.

If logical pointers appear on the **Segment Prefix** panel, the **Tgt-SC** and **Tgt-DG** columns are blank.

Tgt-RBA

The RBA of the target segment. You can modify this field to repair the database.

>4G

N

Indicates that the Tgt-RBA is in the first 4 GB of the database.

Y

Indicates that the Tgt-RBA is in the second 4 GB of an OSAM database.

Position

The arrow (<====) shows which twin chain (forward or backward) you are processing.

What to do next

Use PF3 to return to previous menus.

Important: Be sure to run the Pointer Checker utility after you change data or pointers. If errors are found, restart IMS Database Repair Facility and immediately select option **3. Undo changes** from the **Main menu**. The changes that you made are recorded in the Undo file until you select option **2. View/ Update database** the next time.

Related tasks

Navigating around the database
Use the **Segment Prefix** panel to navigate around the database and to request the display of a segment prefix, segment data, or block in order to zap it.

Navigating around the database

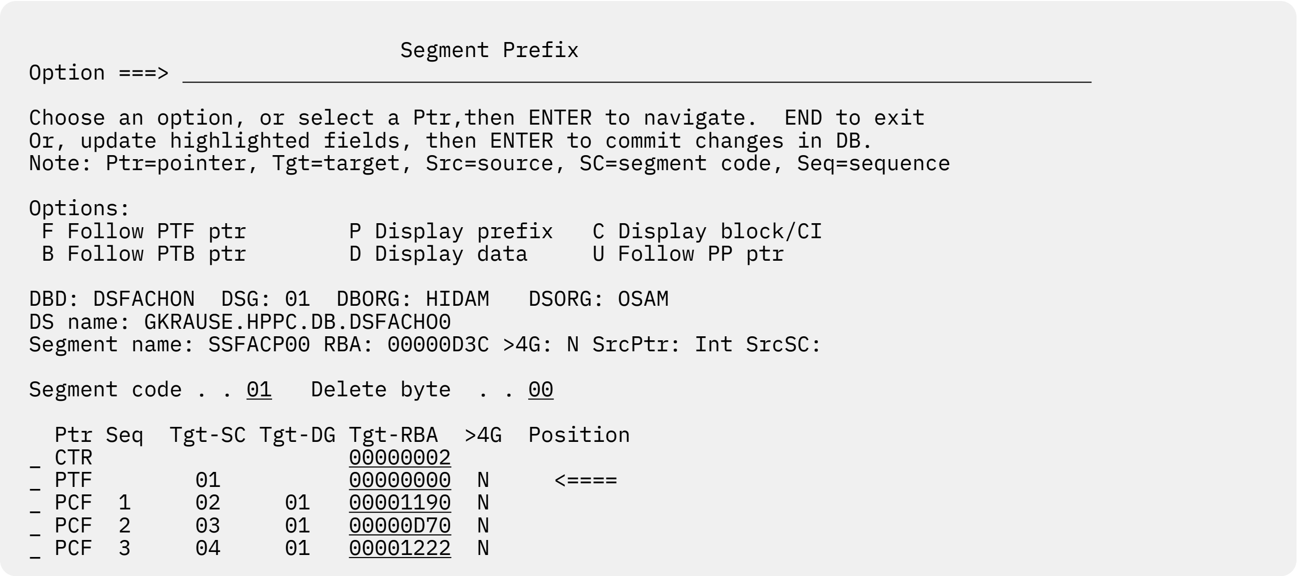
Use the **Segment Prefix** panel to navigate around the database and to request the display of a segment prefix, segment data, or block in order to zap it.

About this task

The **Segment Prefix** panel can be used to navigate through the database and to view and update the segment prefix. To view or update the segment prefix, see “Viewing and updating segment prefix” on page 19. In the following procedure and example, learn how to navigate through the database to locate specific data.

Procedure

In the **Segment Prefix** panel, several options are provided to help you navigate around the database or display data that pertains to the database.



```
                                 Segment Prefix
Option ===> _______________________________________________________________________

Choose an option, or select a Ptr,then ENTER to navigate.  END to exit
Or, update highlighted fields, then ENTER to commit changes in DB.
Note: Ptr=pointer, Tgt=target, Src=source, SC=segment code, Seq=sequence

Options:
 F Follow PTF ptr        P Display prefix   C Display block/CI
 B Follow PTB ptr        D Display data     U Follow PP ptr

DBD: DSFACHON  DSG: 01  DBORG: HIDAM   DSORG: OSAM
DS name: GKRAUSE.HPPC.DB.DSFACHO0
Segment name: SSFACP00 RBA: 00000D3C >4G: N SrcPtr: Int SrcSC:

Segment code . . 01   Delete byte  . . 00

  Ptr Seq  Tgt-SC Tgt-DG Tgt-RBA  >4G  Position
_ CTR                    00000002
_ PTF        01          00000000  N     <====
_ PCF  1     02     01   00001190  N
_ PCF  2     03     01   00000D70  N
_ PCF  3     04     01   00001222  N
```

Figure 13. Segment Prefix panel

IMS Database Repair Facility supports two methods for navigating through the database. One method is to use navigate options (Forward (F), Backward (B), and Up (U) options). The other method is to select a PTF, PTB, PCF, or PP pointer in the segment prefix. For example, you can follow the PTF or PTB chains until you reach the point where you want to go a level lower where you then select a PCF. When you find the pointer for the segment you want, you have a choice of displaying the segment prefix, segment data, or control interval/block data with display options.

If you select a pointer or choose one of the navigate options, **Segment Prefix** panel shows the pointers that are related to the selected segment.

Using navigate options

F Follow PTF ptr
Enter F to move forward in the twin chain of segments, following the PTF pointer. If the PTF pointer does not exist, a message is displayed.

B Follow PTB ptr
Enter B to move backward in the twin chain of segments, following the PTB pointer. If the PTB pointer does not exist, a message is displayed.

U Follow PP ptr
Enter U to follow the PP pointer. If the PP pointer does not exist, a message is displayed.

Selecting a pointer
The selection option is an alternative to the navigate options.

The arrow (<====) in the **Position** field shows which twin chain (forward or backward) you are processing. To change from one chain to another, select PTF or PTB by entering an S to the left of a pointer.

Display options

P Display prefix
Enter P to display the segment prefix. The **Segment Prefix Dump** panel is displayed.

D Display data

Enter D to display the segment data. The **Segment Data** panel is displayed.

C Display block/CI

Enter C to display the contents of the current control interval or database block. The **Block/CI data** panel is displayed.

Tips:

- After you make a selection, a message might be displayed. The message partly obscures the panel. To see the panel without the message, press PF8 and then PF7. Depending on the type of message, pressing Enter might refresh the panel.
- Each time that you navigate to another segment in the database, an entry is made in the audit history file. You can view this file by selecting option **4. View audit history of processed segments** from the **Main menu**.

IMS Database Repair Facility follows these conventions when it evaluates entries on the **Segment Prefix** panel.

- If navigate option F or B is specified, and a PTF, PTB, or PCF is selected, error message FABZ002W is displayed indicating that a conflicting selection was made.
- If navigate option U, display option P (segment prefix), D (segment data), or C (Control Interval) is specified, and a PTF, PTB, or PCF is selected, the following error message is displayed:

  ```
  FABZ002W: CONFLICTING SELECTION. SELECTED FIELDS WERE:
  NAVIGATE OPTION, POINTER TYPE
  ```

- If a PTF, PTB, or PCF with a zero RBA is selected, the following error message is displayed:

  ```
  FABZ001W: END OF xxx POINTER CHAIN HAS BEEN REACHED.
  ```

- If you select a PTF with a zero RBA in an HDAM database, the following error message is displayed:

  ```
  FABZ047W: END OF SYNONYM (PTF) POINTER CHAIN HAS BEEN REACHED.
  ```

- If neither a navigate option nor a PTR option is selected, and no zap of a pointer is entered, the following error message is displayed:

  ```
  FABZ000W: SELECT A POINTER TYPE OR A NAVIGATE OPTION.
  ```

- If a modification to the segment code, delete byte, or target RBA is entered, and a navigate option is entered at the same time, the following error message is displayed:

  ```
  FABZ002W: CONFLICTING SELECTION. SELECTED FIELDS WERE:
  NAVIGATE OPTION, POINTER ZAP.
  ```

Example of navigation

The following simplified database diagram can help you to understand the navigation concepts. Each box represents a database segment. In each box, the segment code is shown as the SC value and the relative byte address as the RBA value. In addition, the PTF, PTB, and PCB pointers are shown.

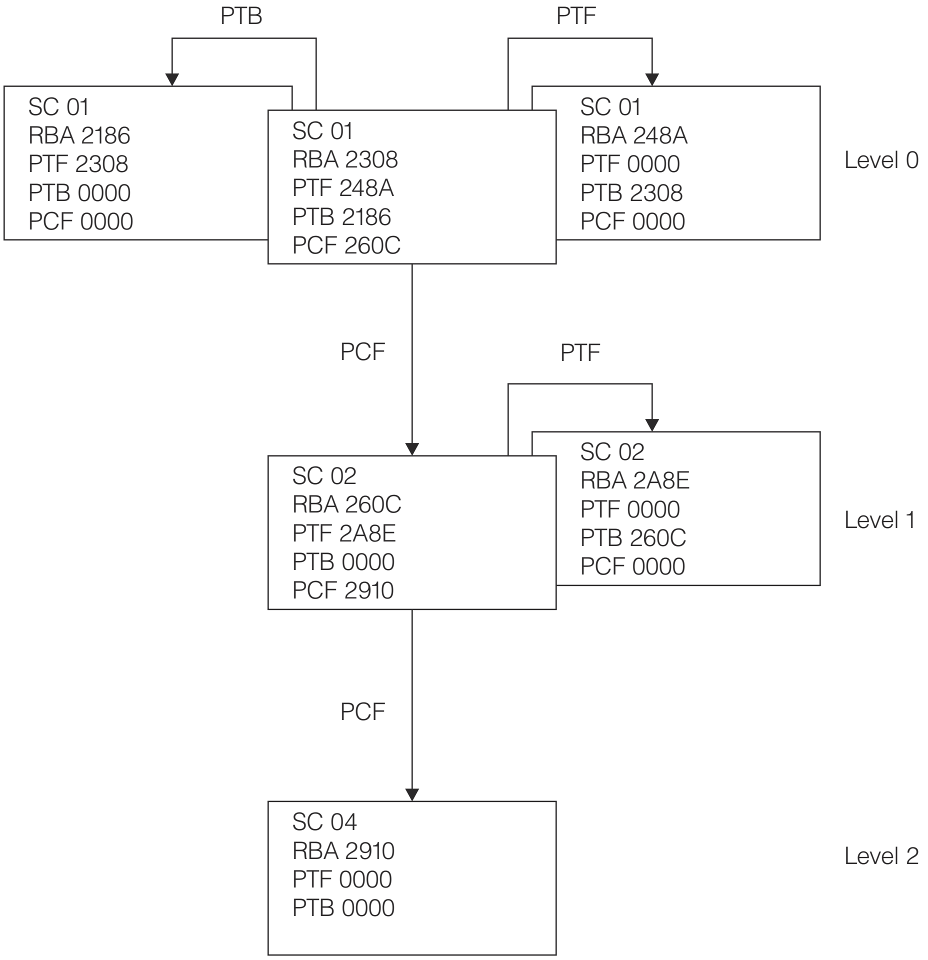
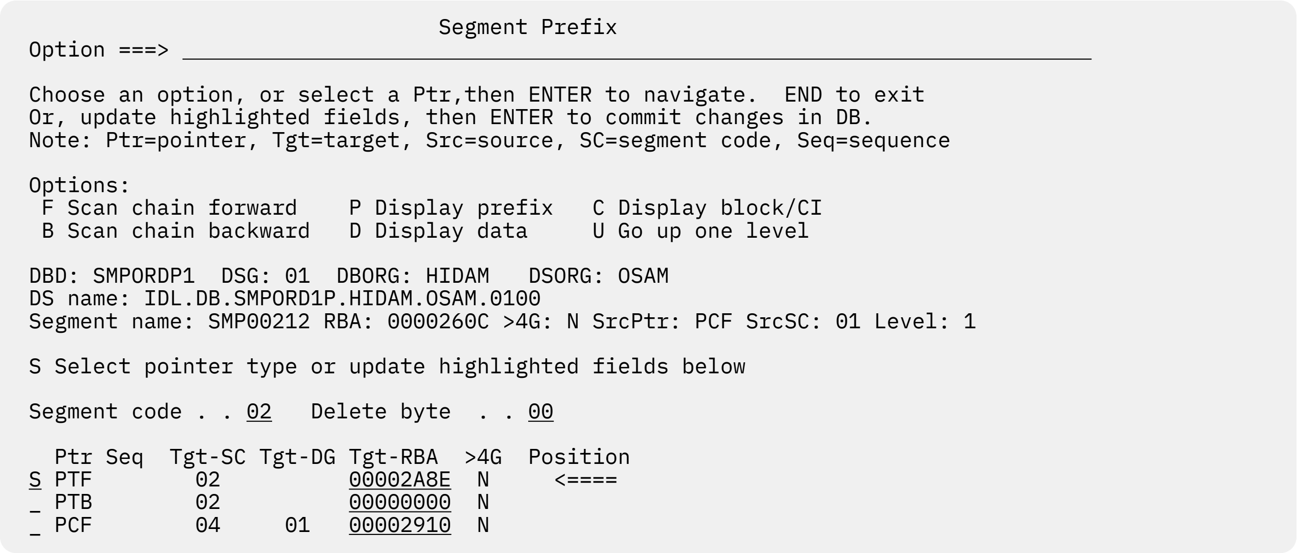


Figure 14. Sample database diagram

The starting point for this diagram is the segment at location (RBA) 2308. The segment prefix that is shown in Figure 13 on page 22 represents this block. In the diagram, the blocks to the left, right, and below the starting block correspond to the PTB pointer, PTF pointer, and PCF pointer that are listed in the **Segment Prefix** panel.

If the physical child pointer is selected, the program moves to the segment at RBA 260C, and the next **Segment Prefix** panel looks like the **Segment Prefix** panel that is shown in the following figure.



```
                                  Segment Prefix
Option ===> _______________________________________________________________________

Choose an option, or select a Ptr,then ENTER to navigate.  END to exit
Or, update highlighted fields, then ENTER to commit changes in DB.
Note: Ptr=pointer, Tgt=target, Src=source, SC=segment code, Seq=sequence

Options:
 F Scan chain forward    P Display prefix   C Display block/CI
 B Scan chain backward   D Display data     U Go up one level

DBD: SMPORDP1  DSG: 01  DBORG: HIDAM   DSORG: OSAM
DS name: IDL.DB.SMPORD1P.HIDAM.OSAM.0100
Segment name: SMP00212 RBA: 0000260C >4G: N SrcPtr: PCF SrcSC: 01 Level: 1

S Select pointer type or update highlighted fields below

Segment code . . 02   Delete byte  . . 00

  Ptr Seq  Tgt-SC Tgt-DG Tgt-RBA  >4G  Position
S PTF        02          00002A8E  N     <====
_ PTB        02          00000000  N
_ PCF        04     01   00002910  N
```

Figure 15. Sample panel after PCF pointer is selected

The information in this panel that is related to the database and data set remain unchanged. However, the following fields that are related to the segment have changed:

- Segment name
- RBA has changed to a different segment
- SrcPtr explains that we got here by a PCF
- SrcSC shows the segment code of the source segment
- Level has changed from 0 to 1, since this segment is a child to the previous segment
- Segment code, the current segment code has a value of 02

The information found in the segment prefix has also changed.

- The counter (CTR) is no longer displayed because it is not defined in the DBD for this segment.
- The target segment codes for the PTF and PTB pointers now reflect the segment code of the current segment. The target segment code of the PCF pointer reflects the segment code of the (grand) child segment.
- The RBA of the PTF has changed to reflect this segment's forward chain.
- The RBA of the PTB is zero, since this is the end of the PTB chain.
- The RBA of the PCF has changed and now points to the grandchild of the original segment.

Navigation possibilities

The navigate options on this panel differ slightly from the options that are shown on the **Segment Prefix** panel in Figure 13 on page 22.

It is valid to go up a level. Enter a U on the Options line to move up a level. However, since this segment is at the beginning of a chain, neither B (Backward) nor PTB is a valid choice.

Viewing and updating segment prefix in the Segment Prefix Dump panel

Use the **Segment Prefix Dump** panel to update the segment prefix that is shown in dump format.

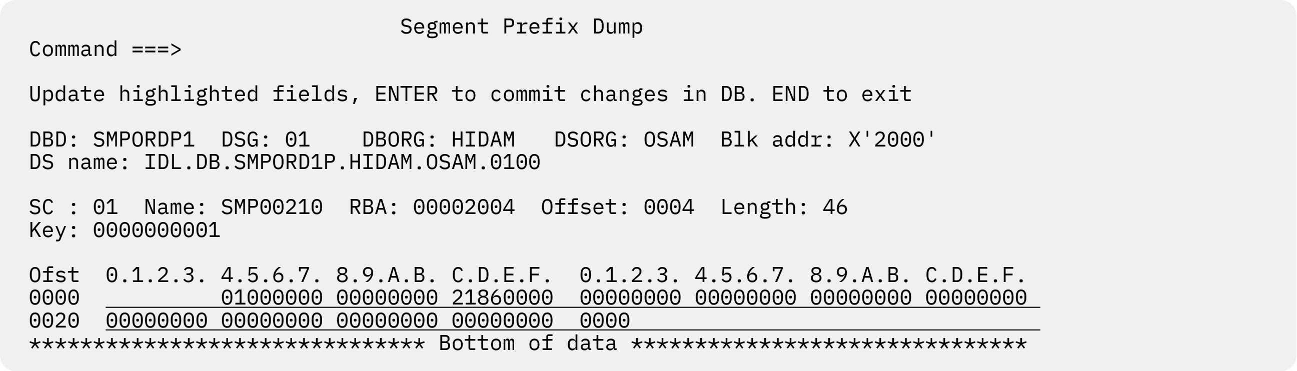
About this task

This panel is another panel where you can update the segment prefix. On the **Segment Prefix** panel, the prefix is already formatted, making it easier to update. However, the **Segment Prefix Dump** panel can include some bytes of the prefix that are not in the formatted version. Depending on your needs, you might prefer to use the **Segment Prefix Dump** panel.

Procedure

Select option P in the **Segment Prefix** panel to display the **Segment Prefix Dump** panel.

The first few lines on this panel provide information that identifies the database, data set, and segment. The lower part of the panel consists of the prefix that is displayed in hex format. A ruler (Ofst 0...2...) helps you locate the information. The segment prefix is displayed below the ruler. You can modify the prefix by overwriting the data that is displayed in this section. Exercise caution when you do so. Press Enter to accept your changes.



```
                             Segment Prefix Dump
Command ===>

Update highlighted fields, ENTER to commit changes in DB. END to exit

DBD: SMPORDP1  DSG: 01    DBORG: HIDAM   DSORG: OSAM  Blk addr: X'2000'
DS name: IDL.DB.SMPORD1P.HIDAM.OSAM.0100

SC : 01  Name: SMP00210  RBA: 00002004  Offset: 0004  Length: 46
Key: 0000000001

Ofst  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.
0000           01000000 00000000 21860000  00000000 00000000 00000000 00000000
0020  00000000 00000000 00000000 00000000  0000
******************************* Bottom of data *******************************
```

Figure 16. Segment Prefix Dump panel

This panel contains the following fields:

DBD
The name of the database, or for a partitioned database, the name of the partition.

DSG
The data set group number or, for a DEDB, the area number.

DBORG
The database organization type.

DSORG
The organization type of the data set.

Blk addr or CI addr
For an OSAM data set, the block address. For a VSAM data set, the control interval address.

DS name
The name of the data set.

SC
The segment code.

Name
The segment name.

RBA
The relative byte address of the segment.

Offset
The offset of the prefix from the beginning of the block or control interval.

Length
The length of the prefix.

Key
The key that is used to access the segment.

What to do next

Use PF3 to return to previous menus.

Important: Be sure to run the Pointer Checker utility after you change data or pointers. If errors are found, restart IMS Database Repair Facility and immediately select option **3. Undo changes** from the **Main menu**. The changes that you made are recorded in the Undo file until you select option **2. View/ Update database** the next time.

Viewing and updating segment data

Use the **Segment Data** panel to update contents of the database segment data.

Procedure

Select option D in the **Segment Prefix** panel to display the **Segment Data** panel.

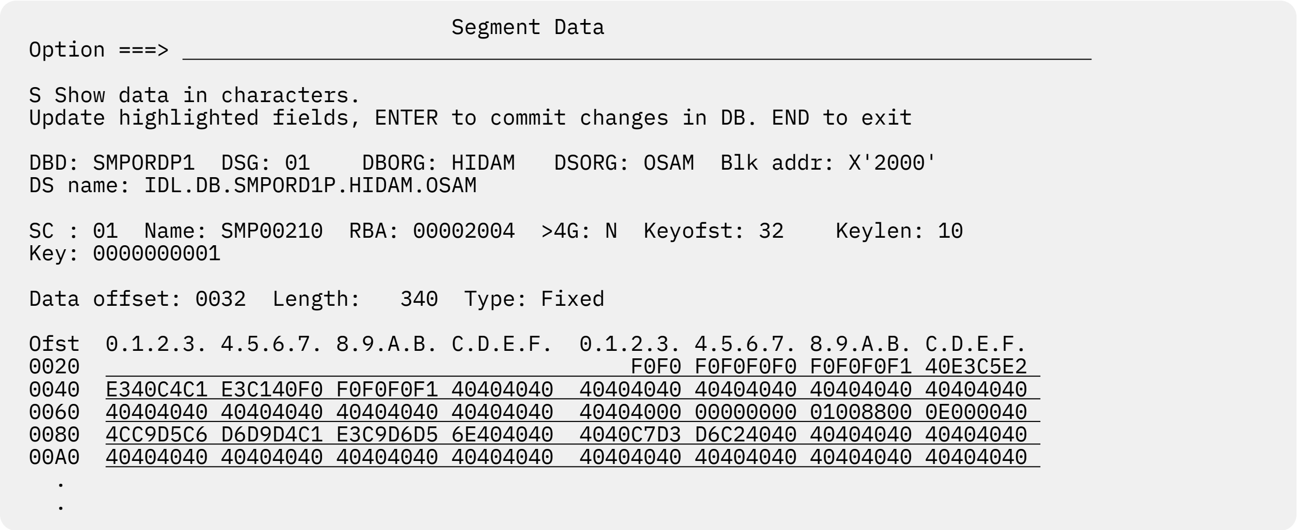
The default view of this panel shows the segment data in hex (dump) format. You can change the view to show the same data in character format. The character format, which is the readable format, helps you to verify the contents of the database segment. After you determine that the segment you are viewing is the segment you want to modify, you can switch back to the hex format panel to make the change.

The first few lines on this panel provide information that identifies the database, data set, and segment. The lower part of the panel consists of the segment data. A ruler (Ofst 0...2...) helps you to read the pointers and data. The data is displayed below the ruler. You can overwrite the data if you want to repair the data. Press Enter to accept your changes.

Restriction: Keys cannot be overwritten. If you attempt to do so, a message is displayed; this message not only indicates that you attempted a prohibited operation, but it also explains where the key fields are. An example of this message is as follows:

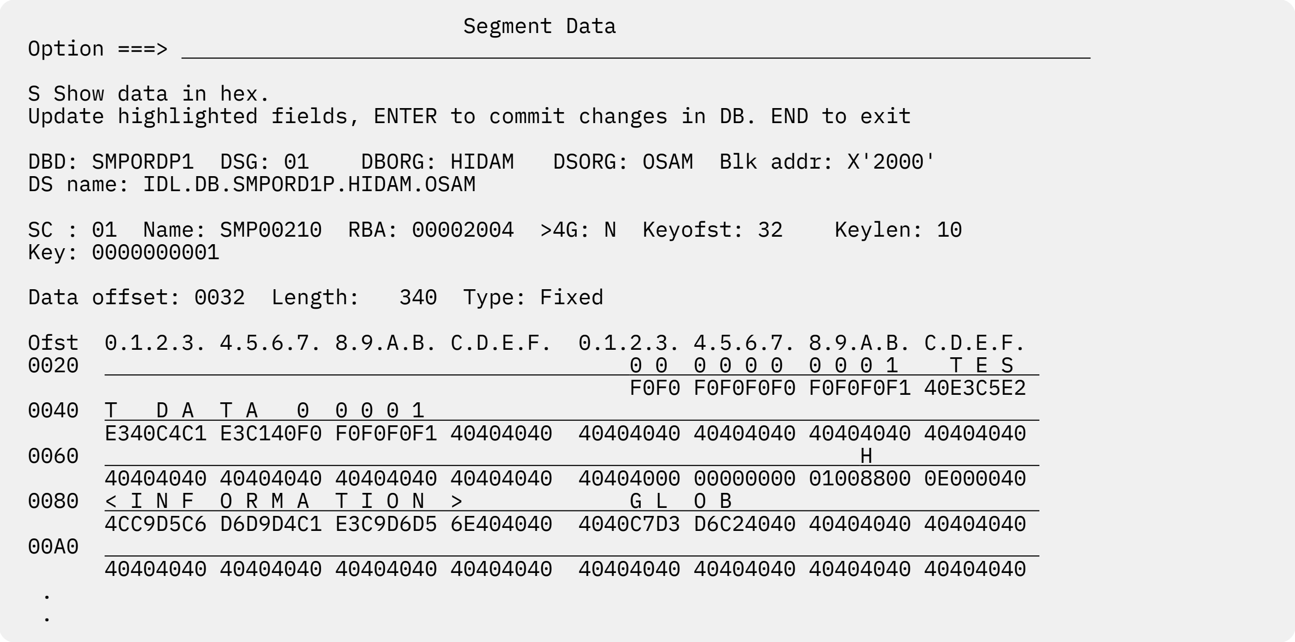
```
FABZ034W: KEY FIELD STARTING AT OFFSET 32 AND ENDING AT OFFSET 3B CANNOT BE MODIFIED.
```

If you try to change key and data on the same line, none of the changes are applied. You must reenter the data changes after the message is displayed.



```
                                 Segment Data
Option ===> ______________________________________________________________________

S Show data in characters.
Update highlighted fields, ENTER to commit changes in DB. END to exit

DBD: SMPORDP1  DSG: 01    DBORG: HIDAM   DSORG: OSAM  Blk addr: X'2000'
DS name: IDL.DB.SMPORD1P.HIDAM.OSAM

SC : 01  Name: SMP00210  RBA: 00002004  >4G: N  Keyofst: 32    Keylen: 10
Key: 0000000001

Data offset: 0032  Length:   340  Type: Fixed

Ofst  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.
0020                                           F0F0 F0F0F0F0 F0F0F0F1 40E3C5E2
0040  E340C4C1 E3C140F0 F0F0F0F1 40404040  40404040 40404040 40404040 40404040
0060  40404040 40404040 40404040 40404040  40404000 00000000 01008800 0E000040
0080  4CC9D5C6 D6D9D4C1 E3C9D6D5 6E404040  4040C7D3 D6C24040 40404040 40404040
00A0  40404040 40404040 40404040 40404040  40404040 40404040 40404040 40404040
   .
   .
```

Figure 17. Segment Data panel in hex format



```
                                  Segment Data
Option ===> ______________________________________________________________________

S Show data in hex.
Update highlighted fields, ENTER to commit changes in DB. END to exit

DBD: SMPORDP1  DSG: 01    DBORG: HIDAM   DSORG: OSAM  Blk addr: X'2000'
DS name: IDL.DB.SMPORD1P.HIDAM.OSAM

SC : 01  Name: SMP00210  RBA: 00002004  >4G: N  Keyofst: 32    Keylen: 10
Key: 0000000001

Data offset: 0032  Length:   340  Type: Fixed

Ofst  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.
0020                                           0 0  0 0 0 0  0 0 0 1    T E S
                                               F0F0 F0F0F0F0 F0F0F0F1 40E3C5E2
0040  T   D A  T A   0  0 0 0 1
      E340C4C1 E3C140F0 F0F0F0F1 40404040  40404040 40404040 40404040 40404040
0060                                                           H
      40404040 40404040 40404040 40404040  40404000 00000000 01008800 0E000040
0080  < I N F  O R M A  T I O N  >             G L  O B
      4CC9D5C6 D6D9D4C1 E3C9D6D5 6E404040  4040C7D3 D6C24040 40404040 40404040
00A0
      40404040 40404040 40404040 40404040  40404040 40404040 40404040 40404040
 .
 .
```

Figure 18. Segment Data panel in character and hex format

This panel contains the following fields:

Option
Enter an S to switch between the hex-only format and character and hex formats.

DBD
The name of the database, or for a partitioned database, the name of the partition.

DSG
The data set group number or, for a DEDB, the area number.

DBORG
The database organization type.

DSORG
The organization type of the data set.

Blk addr or CI addr
For an OSAM data set, the block address. For a VSAM data set, the control interval address.

DS name
The name of the data set.

SC
The segment code.

Name
The segment name.

RBA
The relative byte address of the segment.

>4G

N
Indicates that the segment is in the first 4 GB of the database.

Y
Indicates that the segment is in the second 4 GB of an OSAM database.

Keyofst
The offset of the key that is used to access the segment.

Keylen
The key length.

Key
The key that is used to access the segment.

Offset
The offset of the data from the beginning of the segment.

Length
The length of the displayed data.

Type
The data type, which can be one of the following types:

- Fixed
- Variable
- Variable split

What to do next

Use PF3 to return to previous menus.

Important: Be sure to run the Pointer Checker utility after you change data or pointers. If errors are found, restart IMS Database Repair Facility and immediately select option **3. Undo changes** from the **Main menu**. The changes that you made are recorded in the Undo file until you select option **2. View/ Update database** the next time.

Viewing and updating block or CI data in the Block/CI data panel

Use the **Block/CI data** panel to display the block or control interval (CI) and to modify the database.

Procedure

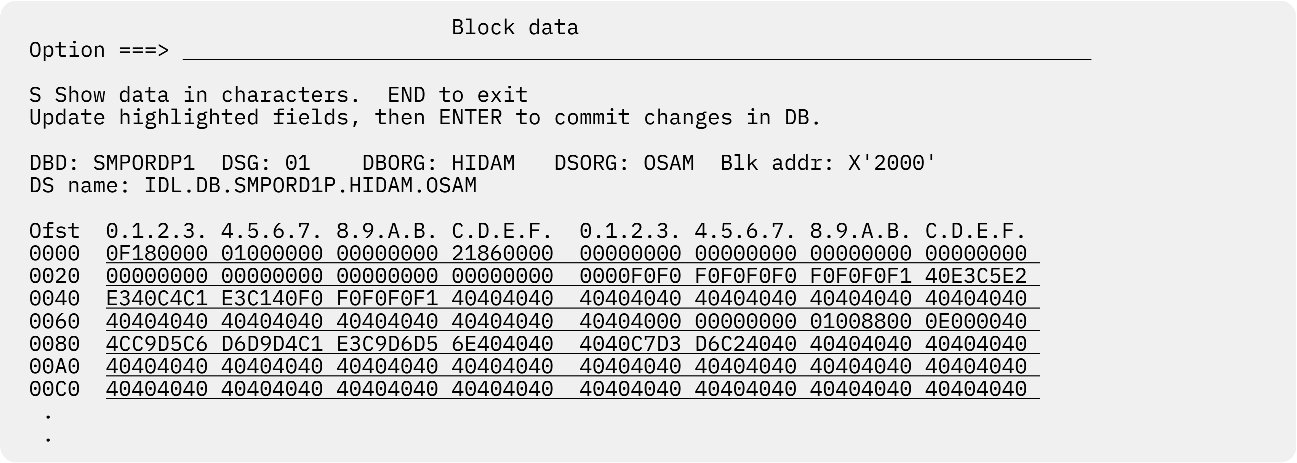
Access this panel from the **Segment Prefix** panel (option C), or from the **Initial selection** panel by specifying a block or CI number in the **Blk #** field or the **CI #** field, or by specifying an RBA that does not point to a valid segment code.

The **Block/CI data** panel has an option to show the same block in character and hex format. The character format is easier to read. The hex format is more compact, but more difficult to read.

The first few lines on this panel provide information that identifies the database and data set. The lower part of the panel consists of the block or control interval. A ruler (Ofst 0...2...) helps you to read the pointers and data. Offset indicates the location of the data from the beginning of the block. The data is displayed below the ruler. You can overwrite the pointers and data. Press Enter to accept your changes.

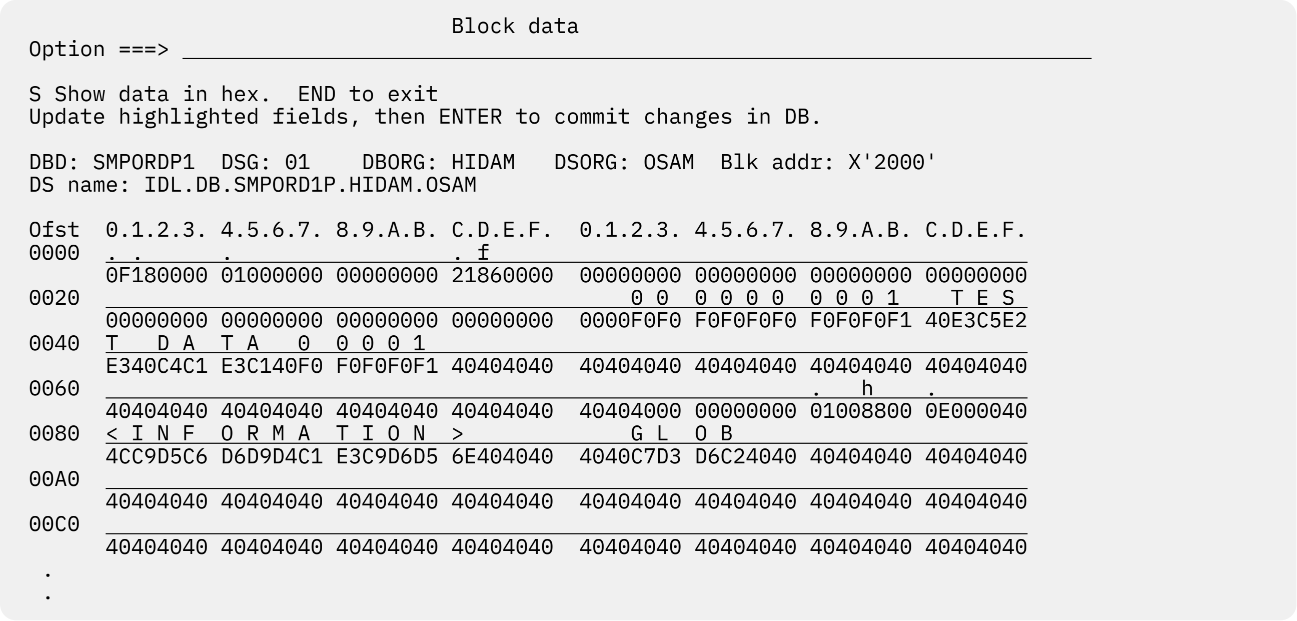
Attention:

- Follow the rules for specifying keys that are described in "Rules for specifying keys" on page 38.
- Use extreme caution when you change keys on this panel. No check is made to see whether a key is being altered.



```
                                 Block data
Option ===>

S Show data in characters.  END to exit
Update highlighted fields, then ENTER to commit changes in DB.

DBD: SMPORDP1  DSG: 01    DBORG: HIDAM   DSORG: OSAM  Blk addr: X'2000'
DS name: IDL.DB.SMPORD1P.HIDAM.OSAM

Ofst  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.
0000  0F180000 01000000 00000000 21860000  00000000 00000000 00000000 00000000
0020  00000000 00000000 00000000 00000000  0000F0F0 F0F0F0F0 F0F0F0F1 40E3C5E2
0040  E340C4C1 E3C140F0 F0F0F0F1 40404040  40404040 40404040 40404040 40404040
0060  40404040 40404040 40404040 40404040  40404000 00000000 01008800 0E000040
0080  4CC9D5C6 D6D9D4C1 E3C9D6D5 6E404040  4040C7D3 D6C24040 40404040 40404040
00A0  40404040 40404040 40404040 40404040  40404040 40404040 40404040 40404040
00C0  40404040 40404040 40404040 40404040  40404040 40404040 40404040 40404040
  .
  .
```

Figure 19. Block/CI data panel in hex format



```
                                 Block data
Option ===>

S Show data in hex.  END to exit
Update highlighted fields, then ENTER to commit changes in DB.

DBD: SMPORDP1  DSG: 01    DBORG: HIDAM   DSORG: OSAM  Blk addr: X'2000'
DS name: IDL.DB.SMPORD1P.HIDAM.OSAM

Ofst  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.
0000  . .      .                 . f
      0F180000 01000000 00000000 21860000  00000000 00000000 00000000 00000000
0020                                           0 0  0 0 0 0  0 0 0 1    T E S
      00000000 00000000 00000000 00000000  0000F0F0 F0F0F0F0 F0F0F0F1 40E3C5E2
0040  T   D A  T A   0  0 0 0 1
      E340C4C1 E3C140F0 F0F0F0F1 40404040  40404040 40404040 40404040 40404040
0060                                                         .   h    .
      40404040 40404040 40404040 40404040  40404000 00000000 01008800 0E000040
0080  < I N F  O R M A  T I O N  >             G L  O B
      4CC9D5C6 D6D9D4C1 E3C9D6D5 6E404040  4040C7D3 D6C24040 40404040 40404040
00A0
      40404040 40404040 40404040 40404040  40404040 40404040 40404040 40404040
00C0
      40404040 40404040 40404040 40404040  40404040 40404040 40404040 40404040
  .
  .
```

Figure 20. Block/CI data panel in character and hexadecimal format

This panel contains the following fields:

Option
: Enter an S to switch between the hex-only format and character and hex format.

DBD
: The name of the database, or for a partitioned database, the name of the partition.

DSG
: The data set group number or, for a DEDB, the area number.

DBORG
: The database organization type.

DSORG
: The organization type of the data set.

Blk addr or CI addr
: The block address or control interval address.

DS name
: The name of the data set.

What to do next

Use PF3 to return to previous menus.

Important: Be sure to run the Pointer Checker utility after you change data or pointers. If errors are found, restart IMS Database Repair Facility and immediately select option **3. Undo changes** from the **Main menu**. The changes that you made are recorded in the Undo file until you select option **2. View/ Update database** the next time.

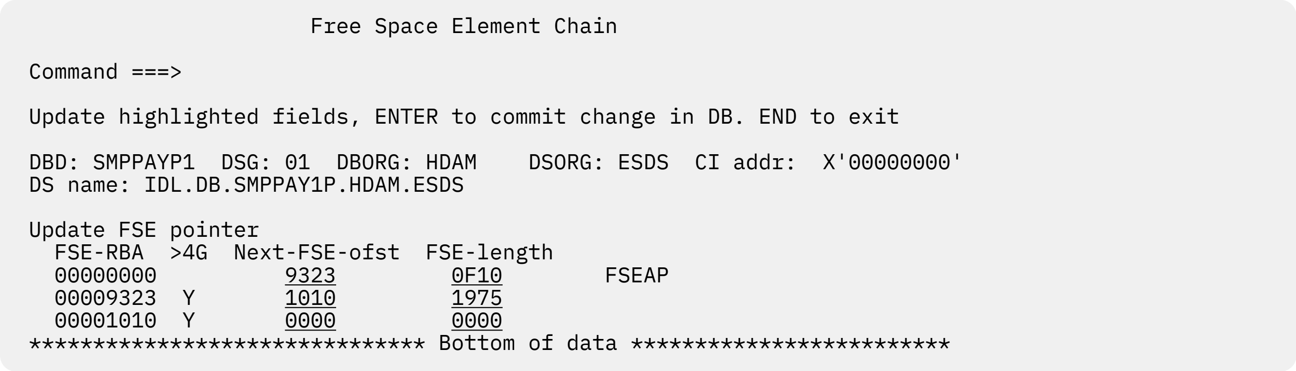
Viewing and updating FSEAP and FSE chain within block or CI

The **Free Space Element Chain** panel shows a free space element anchor point (FSEAP) and a list of free space elements (FSEs). You can use the displayed chain to repair a database.

Procedure

Access this panel by selecting the FSE chain option on the **Initial selection** panel.

The first few lines on this panel provide information that identifies the database and data set. The lower part of the panel shows the FSE anchor point and the chain of free space elements. You can overwrite the values that are shown in **Next-FSE-ofst** or **FSE-length** to repair the database. Press Enter to accept your changes. Be careful when you modify these fields.



```
                      Free Space Element Chain

 Command ===>

 Update highlighted fields, ENTER to commit change in DB. END to exit

 DBD: SMPPAYP1  DSG: 01  DBORG: HDAM    DSORG: ESDS  CI addr:  X'00000000'
 DS name: IDL.DB.SMPPAY1P.HDAM.ESDS

 Update FSE pointer
   FSE-RBA  >4G  Next-FSE-ofst  FSE-length
   00000000        9323          0F10        FSEAP
   00009323  Y     1010          1975
   00001010  Y     0000          0000
******************************* Bottom of data *************************
```

Figure 21. Free Space Element Chain panel

This panel contains the following fields:

DBD
The name of the database, or for a partitioned database, the name of the partition.

DSG
The data set group number or, for a DEDB, the area number.

DBORG
The database organization type.

DSORG
The organization type of the data set.

CI addr or Blk addr
The address of the control interval or block.

DS name
The name of the data set.

FSE-RBA
The relative byte address of the FSE.

>4G

N
Indicates that the source RBA is in the first 4 GB of the database.

Y
Indicates that the source RBA is in the second 4 GB of an OSAM database.

Next-FSE-ofst
The value of the next free space element offset.

FSE-length
The length of the free space element.

What to do next

Use PF3 to return to previous menus.

Important: Be sure to run the Pointer Checker utility after you change data or pointers. If errors are found, restart IMS Database Repair Facility and immediately select option **3. Undo changes** from the **Main menu**. The changes that you made are recorded in the Undo file until you select option **2. View/ Update database** the next time.

Viewing and updating RAP pointers within block or CI

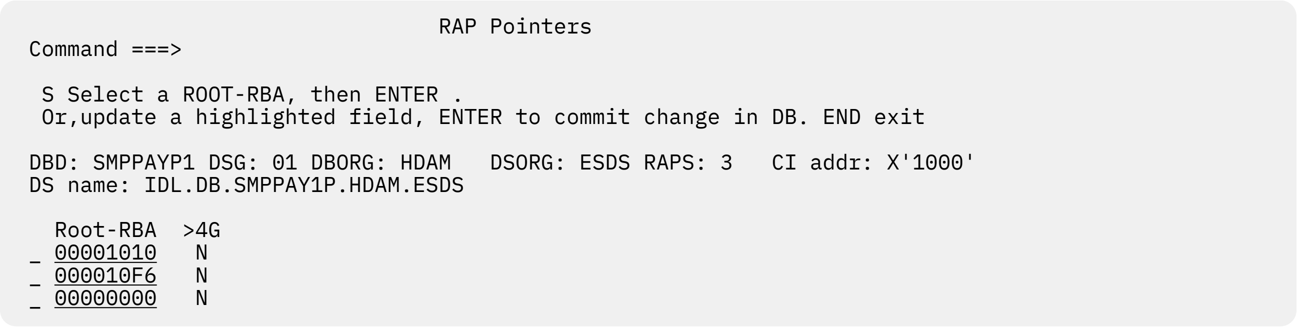
The **RAP Pointers** panel shows a list of root anchor points (RAPs). You can use the list to navigate through the database or to update a RAP pointer if it is in error.

Procedure

Access this panel by selecting the RAPs option on the **Initial selection** panel.

The first few lines on this panel provide information that identifies the database and data set. The lower part of the panel shows a list of RAP pointers. You can overwrite the addresses that are shown under the **Root-RBA** field to modify the database pointers. Press Enter to accept your changes.

You can also use this list to determine where to go next within the database. Enter an S to the left of a pointer to select the next segment. If you select a pointer, the corresponding **Segment Prefix** panel is displayed.



```
                                RAP Pointers
Command ===>

 S Select a ROOT-RBA, then ENTER .
 Or,update a highlighted field, ENTER to commit change in DB. END exit

DBD: SMPPAYP1 DSG: 01 DBORG: HDAM   DSORG: ESDS RAPS: 3   CI addr: X'1000'
DS name: IDL.DB.SMPPAY1P.HDAM.ESDS

  Root-RBA  >4G
_ 00001010   N
_ 000010F6   N
_ 00000000   N
```

Figure 22. RAP Pointers panel

The first few lines on the panel provide information that identifies the database and data set.

DBD
The name of the database, or for a partitioned database, the name of the partition.

DSG
The data set group number or, for a DEDB, the area number.

DBORG
The database organization type.

DSORG
The organization type of the data set.

RAPS
The number of root anchor points.

CI addr or Blk addr
The address of the control interval or block.

DS name
The name of the data set.

Root-RBA
The relative byte address of the root anchor point.

>4G

N
Indicates that the source RBA is in the first 4 GB of the database.

Y
Indicates that the source RBA is in the second 4 GB of an OSAM database.

What to do next

Use PF3 to return to previous menus.

Important: Be sure to run the Pointer Checker utility after you change data or pointers. If errors are found, restart IMS Database Repair Facility and immediately select option **3. Undo changes** from the **Main menu**. The changes that you made are recorded in the Undo file until you select option **2. View/ Update database** the next time.

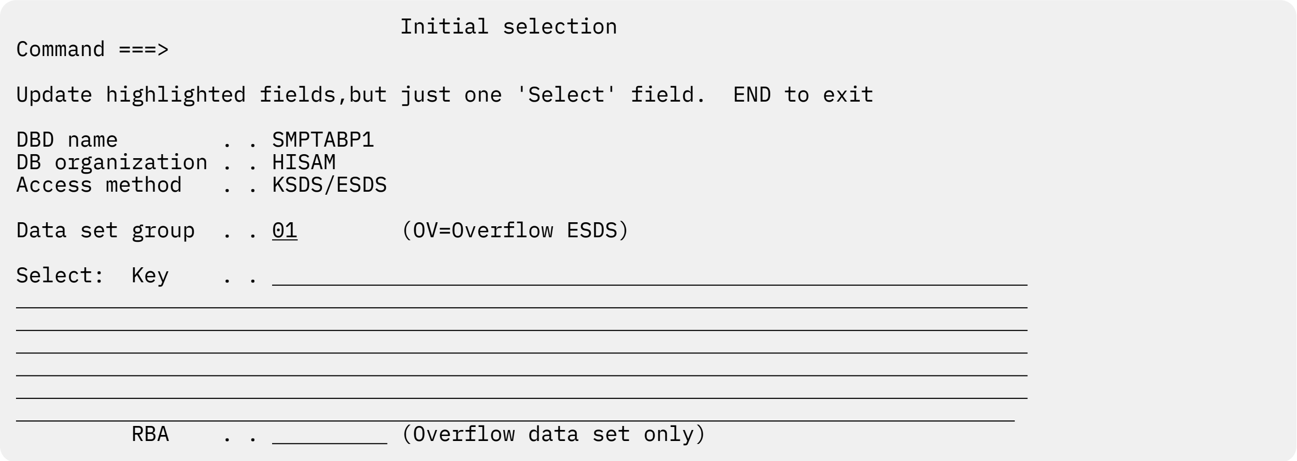
Viewing and updating a HISAM, SHISAM, INDEX, secondary index (SINDEX), or partitioned secondary index (PSINDEX) database

In the **Initial selection** panel, enter additional information to identify the record that you want to display.

Procedure

The **Initial selection** panels for HISAM, SHISAM, INDEX, secondary index (SINDEX), and partitioned secondary index (PSINDEX) databases are similar.

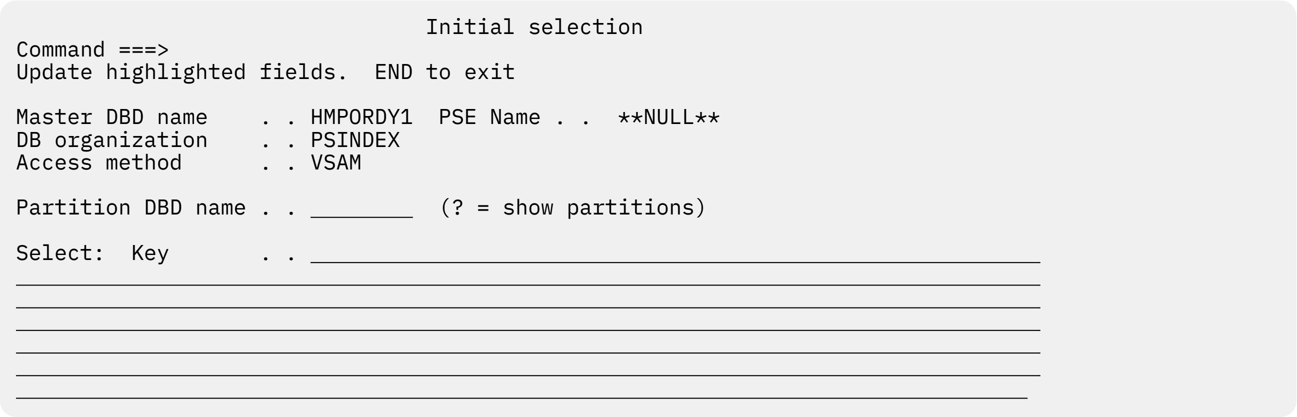
For HISAM, INDEX, or SINDEX databases, the following panel is displayed.



```
                              Initial selection
Command ===>

Update highlighted fields,but just one 'Select' field.  END to exit

DBD name        . . SMPTABP1
DB organization . . HISAM
Access method   . . KSDS/ESDS

Data set group  . . 01        (OV=Overflow ESDS)

Select:  Key    . . ___________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
______________________________________________________________________________
         RBA    . . _________ (Overflow data set only)
```

Figure 23. Initial selection panel for HISAM, INDEX, SINDEX databases

For a partitioned secondary index database, the following panel is displayed.

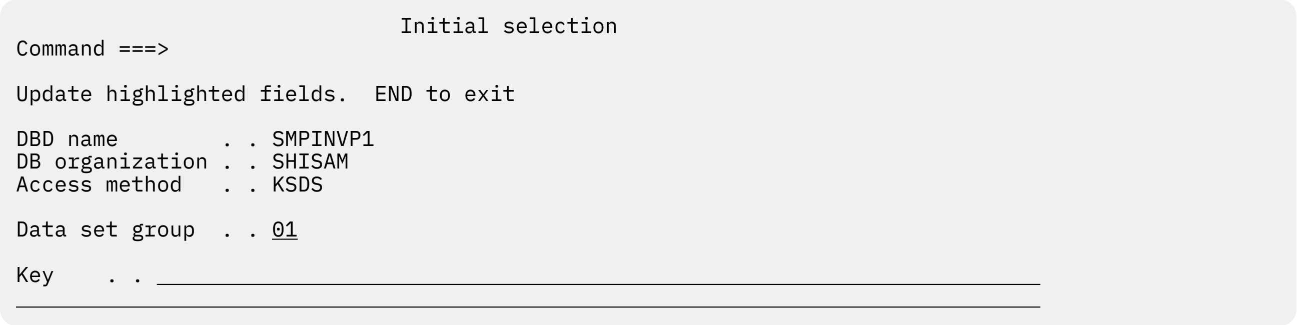


```
                                Initial selection
Command ===>
Update highlighted fields.  END to exit

Master DBD name    . . HMPORDY1  PSE Name . .  **NULL**
DB organization    . . PSINDEX
Access method      . . VSAM

Partition DBD name . . ________  (? = show partitions)

Select:  Key       . . __________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
________________________________________________________________________________
```

Figure 24. Initial selection panel for partitioned secondary index databases

Note: The **PSE Name** field shows the HALDB Partition Selection exit routine.

For a simple HISAM database, that is, a HISAM database that contains only one segment type, the following panel is displayed.



```
                              Initial selection
Command ===>

Update highlighted fields.  END to exit

DBD name        . . SMPINVP1
DB organization . . SHISAM
Access method   . . KSDS

Data set group  . . 01

Key    . . ______________________________________________________________________
_________________________________________________________________________________
```

Figure 25. Initial selection panel for SHISAM databases

1. For a non-partitioned database, specify the data set group in the **Data set group** field.

   If you want to make changes to an overflow ESDS, specify OV in the **Data set group** field.
2. Optional: For a partitioned secondary index database, enter a question mark (?) to display the partition in the **Partition Selection List** panel.
3. Provide a value in either of the following fields:

   Key

   Enter the key of the segment or record to be displayed.

   For a partitioned secondary index database, IMS Database Repair Facility determines the database partition to which it belongs. A message is displayed with this information. If you specify both a partition DBD name and a key on this panel, the partition DBD name is ignored.

   Certain rules apply to specifying the keys. See "Rules for specifying keys" on page 38.

   RBA

   Enter the relative byte address of the record to be displayed.

   The RBA field is applicable only when you specify Data Set Group = OV (overflow) for the HISAM or SINDEX database. When Data Set Group is not OV and you try to enter something in the RBA field, an error message is displayed.

   The Key and RBA options are mutually exclusive.
4. Press Enter.

   Either of the following panels is displayed:

   - **Logical Record** panel for a HISAM or SHISAM record. See "Viewing and updating a HISAM or SHISAM record" on page 35.

- **Segment Data** panel for an index record. See "Viewing and updating an index record" on page 36.
- **PSINDEX Record Data** panel for a partitioned secondary index (PSINDEX) database. See "Viewing and updating an index record" on page 36.

Viewing and updating a HISAM or SHISAM record

The **Logical Record** panel displays the HISAM or SHISAM record that was specified in the **Initial selection** panel. In this panel, you can update the data and certain prefix fields.

Procedure

Select an HISAM or SHISAM record in the **Initial selection** panel to display the **Logical Record** panel.

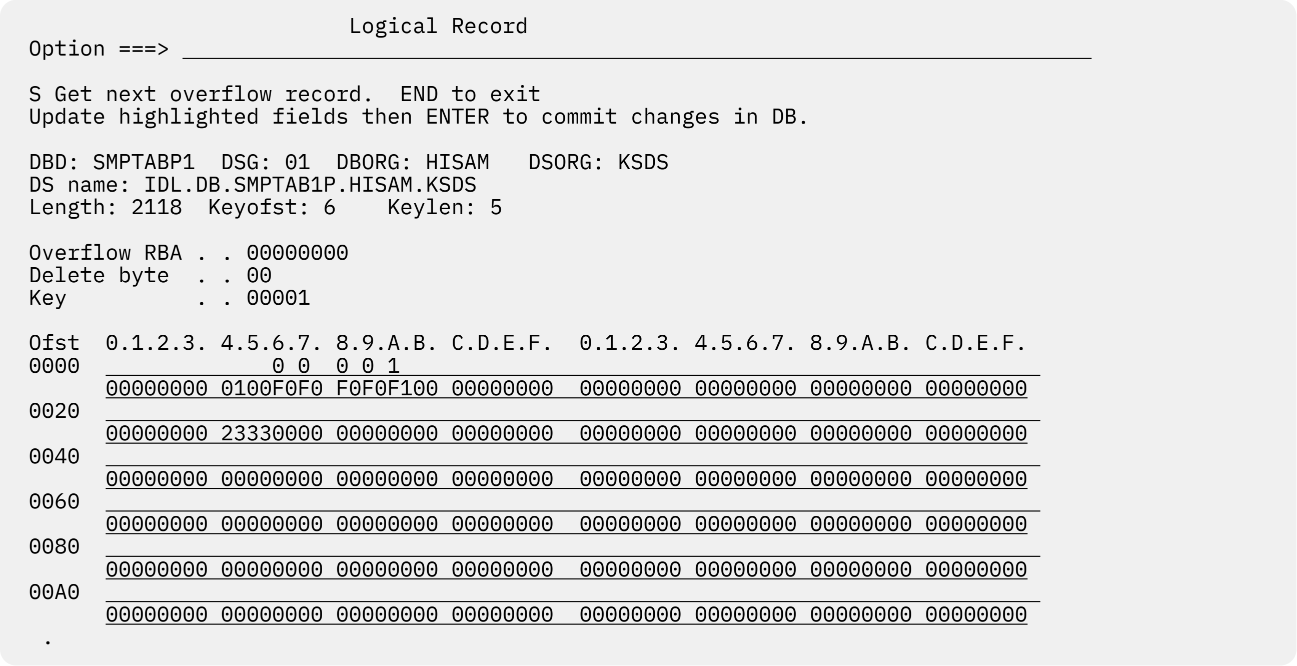
The lower part of the panel consists of the data. The data is displayed below the ruler. Offset indicates the location of the data from the beginning of the logical record. The contents of the segment are displayed in both hexadecimal and character format. Modify the character, hexadecimal data, or both if you think it is in error. Any character data that you enter is case-sensitive.

Caution: If you modify both the character and hex display for the same location, they must be consistent. If they are not, an error occurs. To avoid errors, modify only the hex or only the character representation of the data.

Restriction: Keys cannot be overwritten. If you attempt to do so, a message is displayed; this message not only indicates that you attempted a prohibited operation, but it also explains where the key fields are. An example of this message is as follows:

```
FABZ034W: KEY FIELD STARTING AT OFFSET 32 AND ENDING AT OFFSET 3B CANNOT BE MODIFIED.
```

If you try to change key and data on the same line, none of the changes are applied. You must reenter the data changes after the message is displayed.



```
                         Logical Record
Option ===> ______________________________________________________________________

S Get next overflow record.  END to exit
Update highlighted fields then ENTER to commit changes in DB.

DBD: SMPTABP1  DSG: 01  DBORG: HISAM   DSORG: KSDS
DS name: IDL.DB.SMPTAB1P.HISAM.KSDS
Length: 2118  Keyofst: 6    Keylen: 5

Overflow RBA . . 00000000
Delete byte  . . 00
Key          . . 00001

Ofst  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.
0000                 0 0  0 0 1
      00000000 0100F0F0 F0F0F100 00000000  00000000 00000000 00000000 00000000
0020
      00000000 23330000 00000000 00000000  00000000 00000000 00000000 00000000
0040
      00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
0060
      00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
0080
      00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
00A0
      00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
 .
```

Figure 26. Logical Record panel

This panel contains the following fields:

Option
Enter an S to display the next overflow record.

DBD
The name of the database.

DSG
The data set group number, if applicable.

DBORG
The database organization type.

DSORG
The organization type of the data set.

DS name
The name of the active data set.

Length
The record length.

Keyofst
The offset of the key from the beginning of the record.

Keylen
The key length.

Overflow RBA
The relative byte address of the overflow area. This value is 0 if there is no overflow area.

Delete byte
A zero flag indicates that the segment is not deleted.

Key
The key of the record.

What to do next

Use PF3 to return to previous menus.

Important: Be sure to run the Pointer Checker utility after you change data or pointers. If errors are found, restart IMS Database Repair Facility and immediately select option **3. Undo changes** from the **Main menu**. The changes that you made are recorded in the Undo file until you select option **2. View/ Update database** the next time.

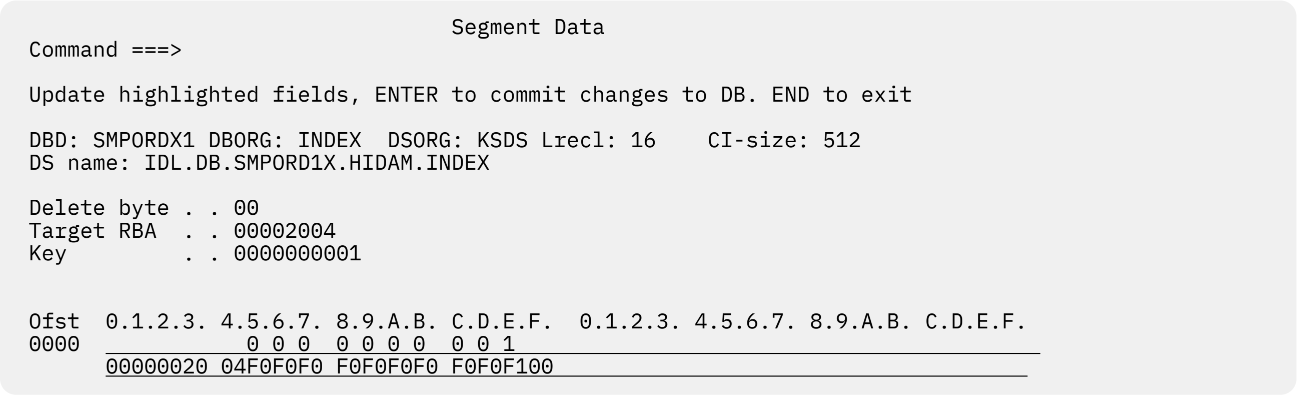
Viewing and updating an index record

Either the **Segment Data** panel or the **PSINDEX Record Data** panel shows the index record that was specified in the **Initial selection** panel. You can update certain key fields in this panel.

Procedure

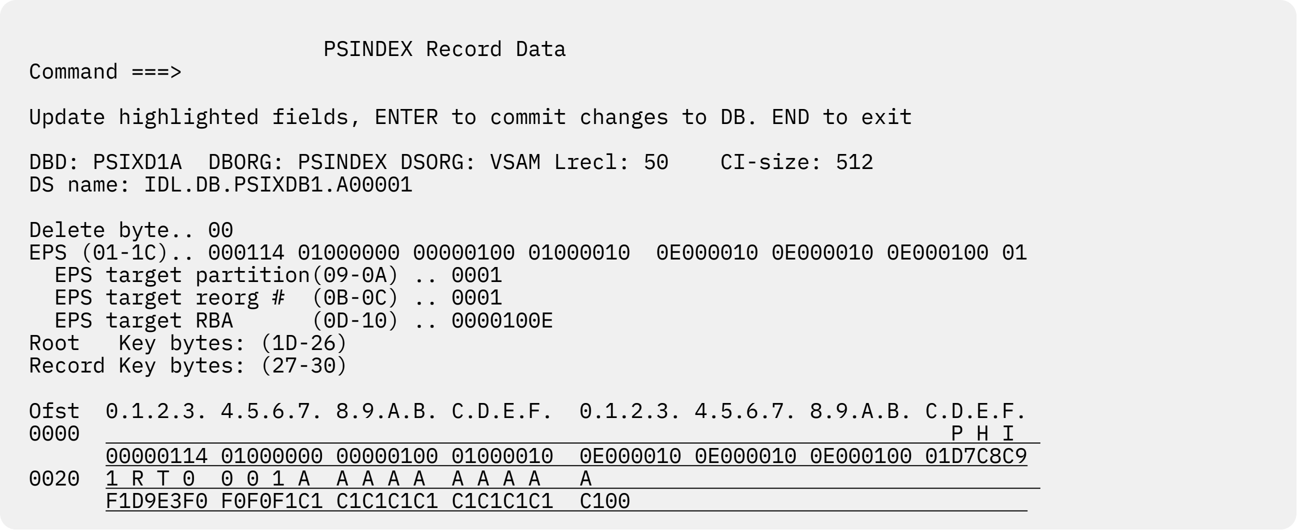
Select an index record in the **Initial selection** panel. If the index record is of an INDEX or SINDEX, the **Segment Data** panel is displayed. If the index record is of a PSINDEX, the **PSINDEX Record Data** panel is displayed.

The lower part of the panel consists of the index record, which is displayed in both hexadecimal and character format. Modify the character or hexadecimal data if you think it is in error. The character and hex data for the same location must be consistent. If they are not, an error message is displayed. Any character data that you enter is case-sensitive.



```
                                 Segment Data
Command ===>

Update highlighted fields, ENTER to commit changes to DB. END to exit

DBD: SMPORDX1 DBORG: INDEX  DSORG: KSDS Lrecl: 16    CI-size: 512
DS name: IDL.DB.SMPORD1X.HIDAM.INDEX

Delete byte . . 00
Target RBA  . . 00002004
Key         . . 0000000001


Ofst  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.
0000             0 0 0  0 0 0 0  0 0 1
      00000020 04F0F0F0 F0F0F0F0 F0F0F100
```

Figure 27. Segment Data panel for index record



```
                       PSINDEX Record Data
Command ===>

Update highlighted fields, ENTER to commit changes to DB. END to exit

DBD: PSIXD1A  DBORG: PSINDEX DSORG: VSAM Lrecl: 50    CI-size: 512
DS name: IDL.DB.PSIXDB1.A00001

Delete byte.. 00
EPS (01-1C).. 000114 01000000 00000100 01000010  0E000010 0E000010 0E000100 01
  EPS target partition(09-0A) .. 0001
  EPS target reorg #  (0B-0C) .. 0001
  EPS target RBA      (0D-10) .. 0000100E
Root   Key bytes: (1D-26)
Record Key bytes: (27-30)

Ofst  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.  0.1.2.3. 4.5.6.7. 8.9.A.B. C.D.E.F.
0000                                                                    P H I
      00000114 01000000 00000100 01000010  0E000010 0E000010 0E000100 01D7C8C9
0020  1 R T 0  0 0 1 A  A A A A  A A A A   A
      F1D9E3F0 F0F0F1C1 C1C1C1C1 C1C1C1C1  C100
```

Figure 28. PSINDEX Record Data panel for partitioned secondary index record

This panel contains the following fields:

DBD
The name of the database, or if the database is a partitioned secondary index (PSINDEX) database, the name of the partition.

DBORG
The database organization type.

DSORG
The organization type of the data set.

Lrecl
The record length.

CI-size
The size of the control interval.

DS name
The name of the active data set.

Delete byte
A zero flag indicates that the segment is not deleted.

Target RBA
The relative byte address of the indexed segment.

Key
The key of the record.

EPS

The extended pointer set (EPS) in the PSINDEX. The following values, which are stored in the EPS, are shown:

EPS target partition

The partition ID of the partition that contains the indexed segment.

EPS reorg #

The reorganization number of the partition that contains the indexed segment.

EPS target RBA

The RBA of the indexed segment.

Root Key bytes

The hexadecimal displacement of the root key within its record.

Record Key bytes

The hexadecimal displacement of the record key within its record.

What to do next

Use PF3 to return to previous menus.

Important: Be sure to run the Pointer Checker utility after you change data or pointers. If errors are found, restart IMS Database Repair Facility and immediately select option **3. Undo changes** from the **Main menu**. The changes that you made are recorded in the Undo file until you select option **2. View/ Update database** the next time.

Rules for specifying keys

When you specify keys, you can specify them as a string of alphanumeric characters or a string of hex characters.

Alphanumeric character strings

These strings can include any combination of the upper and lowercase letters A through Z and numbers 0 - 9, and the following special characters: @ # $ ¢ . ! _ ? and blank. Blanks can appear anywhere in the key. If the key specified is shorter than the key length, it is assumed to be (right) padded with blanks. The following examples show valid keys with a key length of 12:

```
Albert.Hall
   010
#one$ Two¢ 3
```

Hexadecimal strings

Hexadecimal keys are specified by using upper and lowercase characters A through F and the numbers 0 - 9. Blanks can appear anywhere in the key. If the key specified is shorter than the key length, it is assumed to be (right) padded with hex '40's. In the following example, the key is 5 bytes long, yet only the first 4 bytes are shown. The key will be right-padded with a hex '40'.

```
X'0010BCD0
```

Another example, showing a variation of the format, has the same results:

```
0010BCD0'X
```

Undoing changes

Select option **3. Undo changes** to undo the changes you made to the database.

About this task

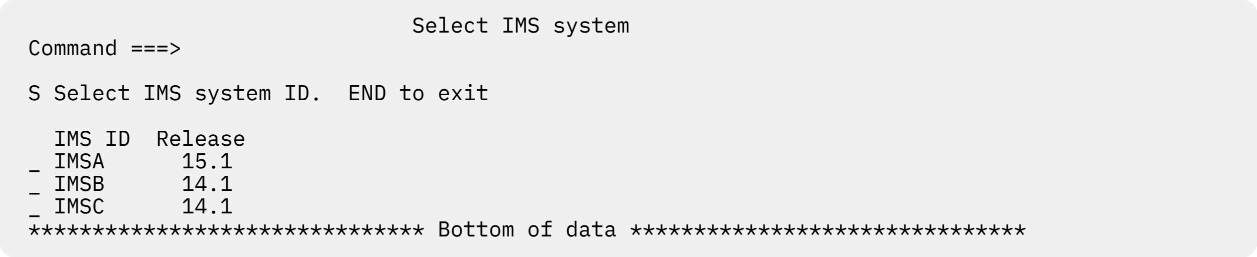
As soon as changes are made to the database, they are entered in the UNDO tables. If IMS Database Repair Facility ends for any reason, upon restart of IMS Database Repair Facility these UNDO entries are visible and you can execute them to reverse the original change to the database. However, after the restart of IMS Database Repair Facility, the UNDO tables for a particular DBD are reallocated when you enter option **2. View/Update database** to work with that DBD again.

Therefore, it is recommended that after you make pointer changes with IMS Database Repair Facility, you run the Pointer Checker utility to determine if any errors were introduced. If errors occur, restart IMS Database Repair Facility and immediately select option **3. Undo changes** from the **Main menu**.

Procedure

1. Select option **3. Undo changes** in the **Main menu** and press Enter.
2. In the **Select IMS system** panel, select the IMS system ID that is associated database changes that you want to undo.

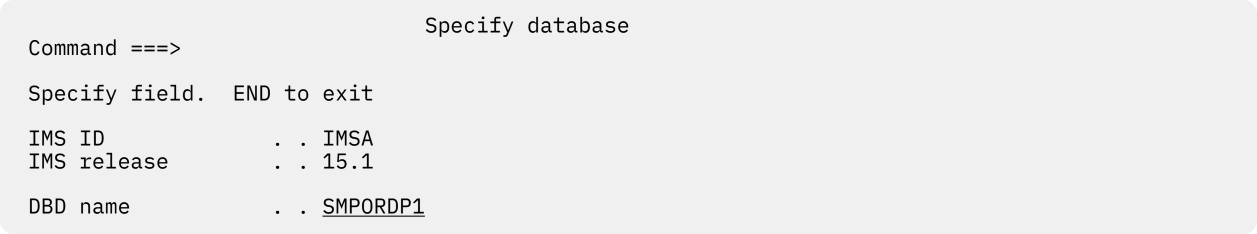
   Enter an S in the input field that corresponds to the IMS system ID. Then, press Enter.



```
                              Select IMS system
Command ===>

S Select IMS system ID.  END to exit

  IMS ID  Release
_ IMSA      15.1
_ IMSB      14.1
_ IMSC      14.1
******************************* Bottom of data *******************************
```

Figure 29. Select IMS system panel

3. In the **Specify database** panel, specify the database name or, for a partitioned database, the master DBD name in the **DBD name** field. Then, press Enter.



```
                               Specify database
Command ===>

Specify field.  END to exit

IMS ID             . . IMSA
IMS release        . . 15.1

DBD name           . . SMPORDP1
```

Figure 30. Specify database panel

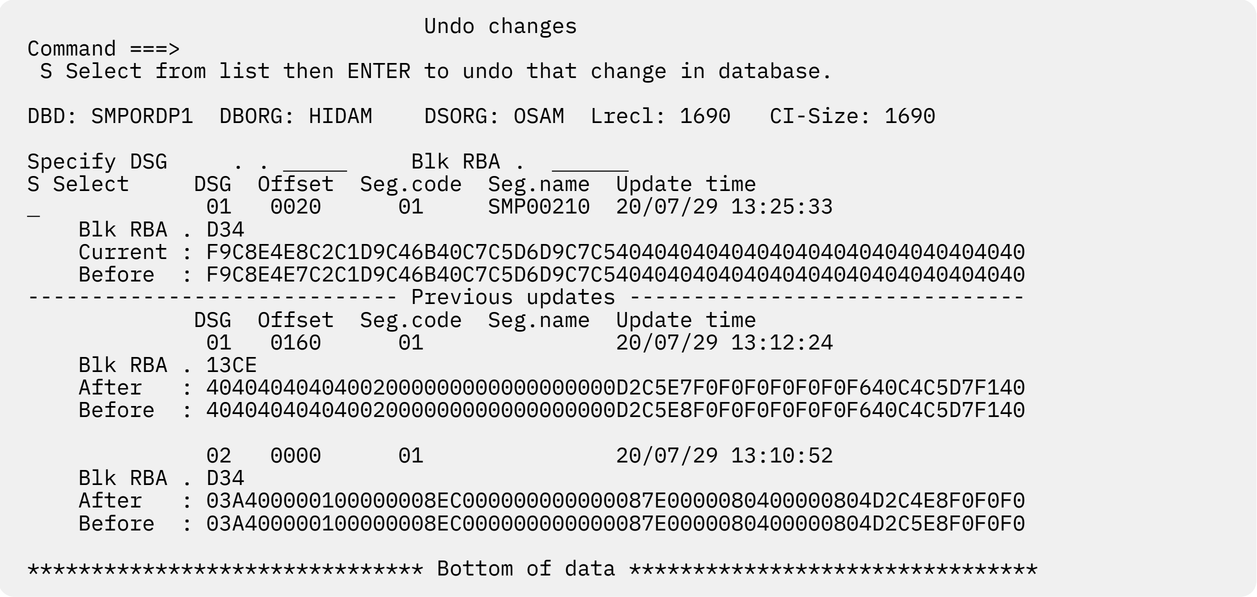
   If you specify the master DBD name of a partitioned database, **Partition Selection List** panel is displayed. Select a partition in the panel by entering an S for the partition. Then, press Enter.

4. In the **Undo changes** panel, locate the change that you want to undo.

   This panel lists the changes that were made to the database. The most recent change is listed first (before the **Previous updates** section) and the other changes are listed in the **Previous updates** section. The changes are shown in LIFO order, that is, the more recent changes are at the top of the list, and the oldest changes are at the bottom of the list. Use PF8 and PF7 to scroll through the list.

   You can undo only the change that is shown above the **Previous updates** section. To undo a change, enter an S in the input field of a data line, and then press Enter. If you undo a change, the **After** and **Before** data lines of the next most recent change are moved to the current area. Because you can undo only the current and most recent changes, you must undo the changes in the order they were performed. However, by specifying the block RBA or data set group, you can limit yourself to undoing the changes for just one block address or one data set group even if you made changes to multiple blocks or data set groups. You can locate the block RBA or data set group by scrolling through the list of previous updates.

   If the same area was modified several times, it is listed once for each change in the list in the **Previous updates** section. To reverse one of these changes, you must reverse the most recent changes until you reach the data line you want to undo.



```
                               Undo changes
Command ===>
 S Select from list then ENTER to undo that change in database.

DBD: SMPORDP1  DBORG: HIDAM    DSORG: OSAM  Lrecl: 1690   CI-Size: 1690

Specify DSG     . . _____      Blk RBA .  ______
S Select     DSG  Offset  Seg.code  Seg.name  Update time
_             01   0020      01     SMP00210  20/07/29 13:25:33
    Blk RBA . D34
    Current : F9C8E4E8C2C1D9C46B40C7C5D6D9C7C540404040404040404040404040404040
    Before  : F9C8E4E7C2C1D9C46B40C7C5D6D9C7C540404040404040404040404040404040
----------------------------- Previous updates --------------------------------
             DSG  Offset  Seg.code  Seg.name  Update time
              01   0160      01               20/07/29 13:12:24
    Blk RBA . 13CE
    After   : 40404040404002000000000000000000D2C5E7F0F0F0F0F0F0F640C4C5D7F140
    Before  : 40404040404002000000000000000000D2C5E8F0F0F0F0F0F0F640C4C5D7F140

              02   0000      01               20/07/29 13:10:52
    Blk RBA . D34
    After   : 03A400000100000008EC000000000000087E0000080400000804D2C4E8F0F0F0
    Before  : 03A400000100000008EC000000000000087E0000080400000804D2C5E8F0F0F0

******************************* Bottom of data *********************************
```

Figure 31. Undo changes panel

This panel contains the following fields:

DBD
The name of the database, or for a partitioned database, the name of the partition.

DBORG
The database organization type.

DSORG
The organization type of the data set.

Lrecl
The record length.

CI size or Blk size
The size of the control interval or block.

Specify DSG
If you specify a data set group number or an area number on this line, only changes from that data set group or area are displayed. If you want to undo only the changes in one data set group or one area, specify a DSG.

You can determine the data set group number or the area number by checking the value that is shown for DSG in the list of changes that are shown in the **Previous updates** section.

Specify Blk RBA or Specify CI RBA
If you specify a block RBA on this line, only changes from that block are displayed. If you made changes to multiple blocks but want to undo only the changes in one block, specify an RBA.

You can determine the block address by checking the value that is shown for Blk RBA in the list of changes that are shown in the **Previous updates** section.

Select (S)
Enter an S to undo the change that is displayed. You can undo only the current change.

DSG
The data set group number or, for a DEDB, the area number.

Offset
The offset of the change from the beginning of the segment.

Seg.code
The code of the active segment.

Seg.name
The segment name.

Update time
When the change was made. Both a date and a timestamp are displayed.

Blk RBA or CI RBA
The relative byte address of the block.

Current
The changed value of the data. For the most recent change, this field is labeled `Current`. You can undo only the change in the **Current** line. For each block, changes must be undone in the reverse order they were performed. That is, the most recent change must be undone before you can undo the change that preceded it.

Before
The former value of the data at the same location. The data content shows the data before it was replaced by what is shown on the **Current** or **After** line.

What to do next

After the change is undone, the panel is refreshed, and contains a message that the database was successfully updated. The **Current** line now shows the present status of the database.

To return to the **Main menu**, press END several times until the **Main menu** is displayed.

Viewing audit history of processed segments

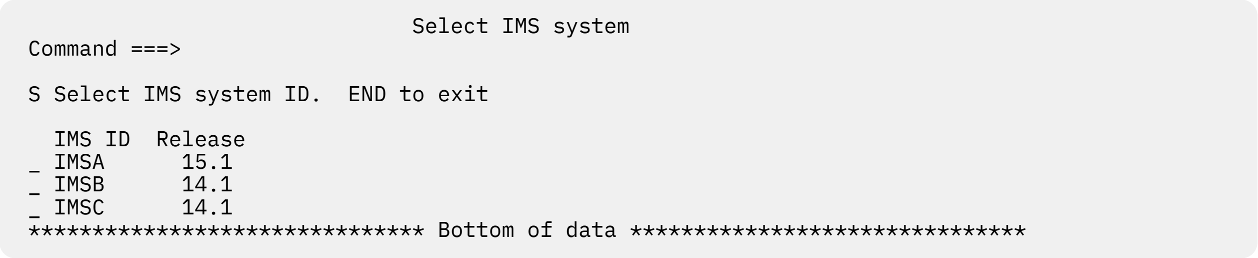
Select option **4. View audit history of processed segments** to view a trace of all the segments of a database that you viewed while you navigated through the database.

About this task

This feature is available only from the time when IMS Database Repair Facility is invoked for a selected database until it is re-invoked and option **2. View/Update database** is again selected for that database. At that point, the history file is reallocated.

Procedure

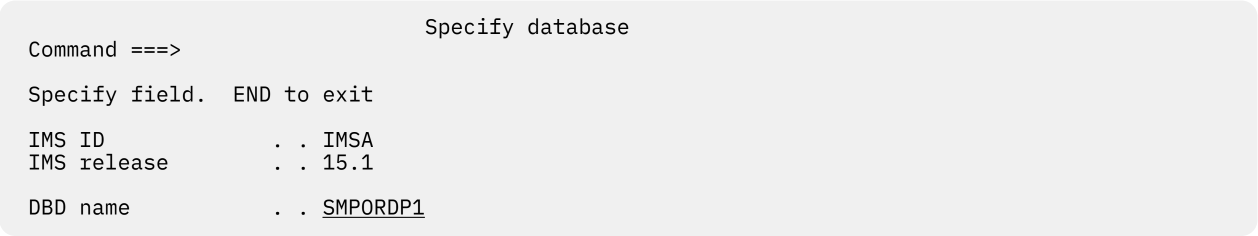
1. Select option **4. View audit history of processed segments** in the **Main menu** and press Enter.
2. In the **Select IMS system** panel, select the IMS system ID that is associated with the history of segments that you want to review by entering an S in the input field that corresponds to the IMS system ID. Then, press Enter.



```
                              Select IMS system
Command ===>

S Select IMS system ID.  END to exit

  IMS ID  Release
_ IMSA      15.1
_ IMSB      14.1
_ IMSC      14.1
******************************* Bottom of data *******************************
```

Figure 32. Select IMS system panel

3. In the **Specify database** panel, specify the database name or, for a partitioned database, the master DBD name in the **DBD name** field. Then, press Enter.



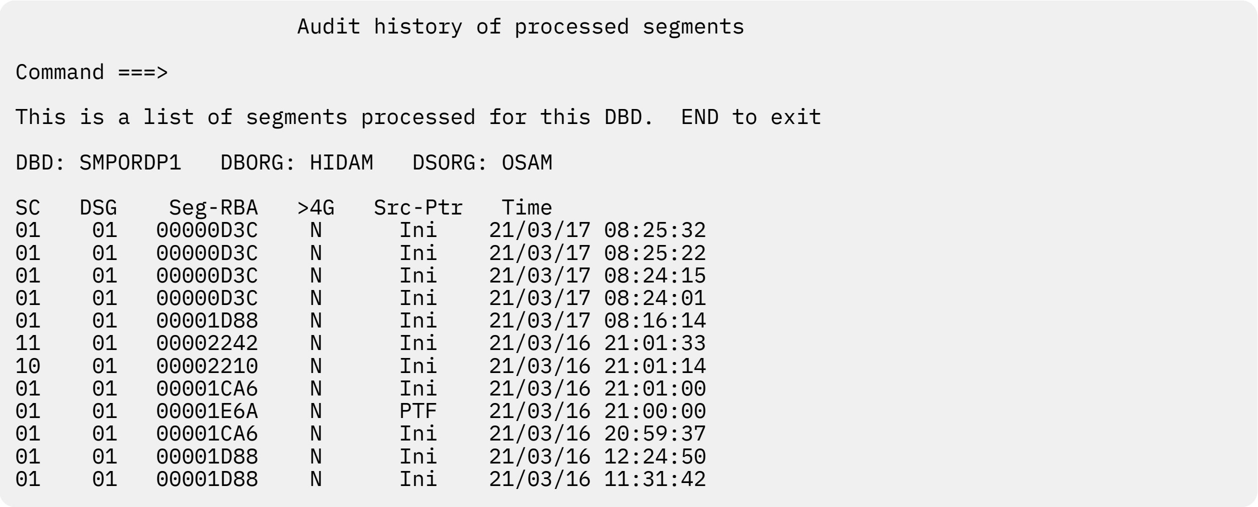
```
                                Specify database
Command ===>

Specify field.  END to exit

IMS ID            . . IMSA
IMS release       . . 15.1

DBD name          . . SMPORDP1
```

Figure 33. Specify database panel

If you specify the master DBD name of a partitioned database, the **Partition Selection List** panel is displayed. Select a partition in the panel by entering an S for the partition. Then, press Enter.

4. Review the history of processed segments in the **Audit history of processed segments** panel. This panel includes the RBAs of all segments that were accessed while you navigated through the database. Additional information is also shown to help you identify the segment and how it was accessed during IMS Database Repair Facility run.

   The segment that was most recently accessed is shown at the top of the list. Identifying information about the segments is provided under the **Time** heading.



```
                       Audit history of processed segments

Command ===>

This is a list of segments processed for this DBD.  END to exit

DBD: SMPORDP1   DBORG: HIDAM   DSORG: OSAM

SC   DSG    Seg-RBA   >4G   Src-Ptr   Time
01    01   00000D3C    N      Ini    21/03/17 08:25:32
01    01   00000D3C    N      Ini    21/03/17 08:25:22
01    01   00000D3C    N      Ini    21/03/17 08:24:15
01    01   00000D3C    N      Ini    21/03/17 08:24:01
01    01   00001D88    N      Ini    21/03/17 08:16:14
11    01   00002242    N      Ini    21/03/16 21:01:33
10    01   00002210    N      Ini    21/03/16 21:01:14
01    01   00001CA6    N      Ini    21/03/16 21:01:00
01    01   00001E6A    N      PTF    21/03/16 21:00:00
01    01   00001CA6    N      Ini    21/03/16 20:59:37
01    01   00001D88    N      Ini    21/03/16 12:24:50
01    01   00001D88    N      Ini    21/03/16 11:31:42
```

Figure 34. Audit history of processed segments panel

This panel contains the following fields:

DBD
The name of the database, or for a partitioned database, the name of the partition.

DBORG
The database organization type.

DSORG
The organization type of the data set.

SC
The segment code.

DSG
The data set group number or, for a DEDB, the area number.

Seg-RBA
The relative byte address of the segment.

>4G

N
Indicates that the segment is in the first 4 GB of the database.

Y

Indicates that the segment is in the second 4 GB of an OSAM database.

Src-Ptr

The type of pointer, which can be one of the following types:

PTF

Physical twin forward pointer.

PCF

Physical child first pointer.

PP

Physical parent pointer.

Ini

If you accessed this location in the database by specifying an initial value, such as an RBA, block number, or key, Ini is displayed.

Time

The time of segment access. It consists of the year, month, day, hour, minute, and second in the following format:

```
yy/mm/dd hh:mm:ss
```

What to do next

To return to the **Main menu**, press END several times until the **Main menu** is displayed.

Saving changes in batch format

Select option **5. Save changes in batch format** to save the current changes in a file.

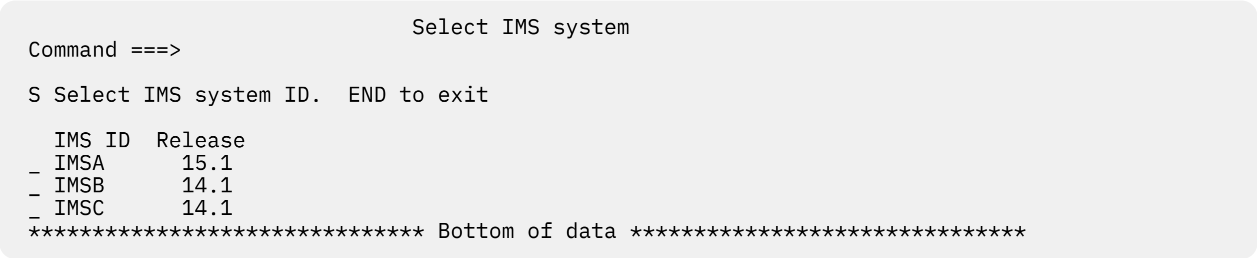
About this task

By selecting this option, you can save the current changes in a file as JCL records. You can then copy the JCL records to the SYSIN statement of an IMS Database Repair Facility batch job and apply the same changes that you made through the interactive operations to a copy of the database.

Current changes are defined as those changes made to a database that you did not undo. Every time that you make a change to the data in a database, the change is recorded in the UNDO table. When you undo a change, it is removed from the UNDO table. Therefore, the file that is created by option **5. Save changes in batch format** has one change for each entry in the UNDO list for a given DBD. The UNDO list does persist across IMS Database Repair Facility sessions, but once you select option **2. View/Update database** again, the UNDO list is cleared.

Procedure

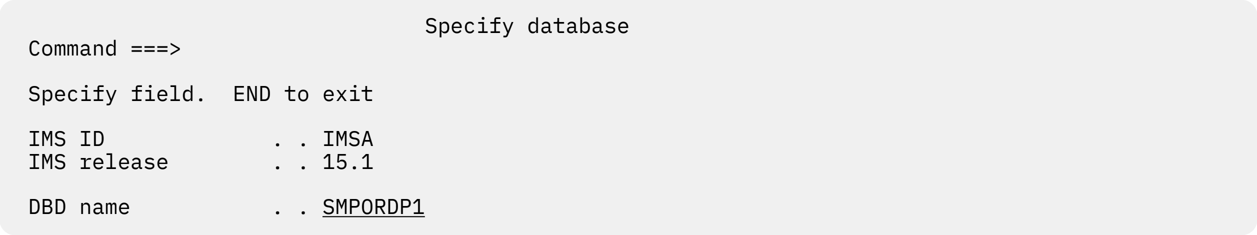
1. Select option **5. Save changes in batch format** in the **Main menu** and press Enter.
2. In the **Select IMS system** panel, select the IMS system ID that is associated with the database changes you want to save by entering an S in the input field that corresponds to the IMS system ID. Then, press Enter.



```
                              Select IMS system
Command ===>

S Select IMS system ID.  END to exit

  IMS ID  Release
_ IMSA      15.1
_ IMSB      14.1
_ IMSC      14.1
******************************* Bottom of data *******************************
```

Figure 35. Select IMS system panel

3. In the **Specify database** panel, specify the database name or, for a partitioned database, the master DBD name in the **DBD name** field. Then, press Enter.



```
                               Specify database
Command ===>

Specify field.  END to exit

IMS ID           . . IMSA
IMS release      . . 15.1

DBD name         . . SMPORDP1
```

Figure 36. Specify database panel

If you specify the master DBD name of a partitioned database, the **Partition Selection List** panel is displayed. Select the partition in the panel by entering an S for the partition. Then, press Enter.

Results

A message is displayed either indicating that the file was created successfully or that no changes were saved. If a new file is created, the message contains the file name. Press the End key to exit this panel and return to the **Main menu**.

Browse the created file. The file contains the data that you can copy into the SYSIN statement of a VSAM batch job or an OSAM batch job of IMS Database Repair Facility.

For example, if the DBD is DSFACHON, the high-level qualifier for the work data sets (*workhlq*) that you specified when you started the IMS Database Repair Facility session is ZZZ, and the user ID is DBT, then the created file name is `ZZZ.DBT.FABZ.DSFACHON.BATCHINP`. The file contains the following data:

```
//* DBR ONLINE UPDATED DATA SET=DBT.HPPC.DB.DSFACHO0
//* COPY THESE RECORDS TO SYSIN IN THE OSAM BATCH JOB
ORBA 3380
VER 0020 F9E9E4E9E8C1D9C440404040D6D9C7C5404040404040404040404040
REP 0020 F9C8E4E9E8C1D9C440404040D6D9C7C5404040404040404040404040
```

//* DBR...
This comment line indicates which data set was changed.

//* COPY...
This comment line indicates that the data set changed was OSAM so you run the OSAM batch job.

ORBA, VER, REP ...
Copy these lines into the OSAM batch job's SYSIN statement.

Chapter 3. Repairing VSAM data sets in batch mode

You can run IMS Database Repair Facility in batch mode to modify VSAM data sets.

In the following topics, whenever the term IMS Database Repair Facility appears without qualification, it refers to IMS Database Repair Facility running in batch mode.

Topics:

- “Overview of batch IMS Database Repair Facility for VSAM” on page 45
- “Modifying a VSAM data set” on page 47
- “SYSIN data set” on page 48
- “SYSPRINT data set” on page 54
- “Examples” on page 54

Overview of batch IMS Database Repair Facility for VSAM

An important feature of the batch version of IMS Database Repair Facility is that you can use it to modify both IMS and non-IMS VSAM data sets. You might already be familiar with the MVS SPZAP (Superzap) program. The batch version of IMS Database Repair Facility operates in a similar manner.

You can specify the data to change by supplying the following information to IMS Database Repair Facility:

- Key (KSDS only)
- Relative byte address (RBA) (KSDS and ESDS)
- Relative-record number (RRDS only)
- Control interval (all types)

When SYSIN control statements are used as part of a batch job, messages are sent to SYSPRINT. When the system console is used to enter control statements, messages are sent to the console. You can receive reports in the SYSPRINT data set for verification whether you are using a batch job or the system console.

Functions

The batch version of IMS Database Repair Facility supports the following three functions:

Verify function

Compares data before changing the data.

The Verify function compares the data at a specific location in a VSAM data set to data that you supply.

Recommendation: A Verify operation should always be done before a Replace operation. If, during a Verify operation, the batch IMS Database Repair Facility finds that the two data fields it is comparing are not the same, the Replace operation is canceled. This feature prevents making accidental changes to valid data. When you use the batch IMS Database Repair Facility, data is compared to verify that it is the same. If data is not the same, the data that is in the VSAM data set is either printed in a report format or is displayed on your terminal screen.

Replace function

Changes data.

The Replace function changes the data at a specific location in a VSAM data set with data that you supply.

Recommendation: To eliminate the possibility of changing good data, always perform a Verify operation before a Replace operation. If data does not match during a Verify operation, the Replace is canceled. If data does not match during a Verify operation, the program ignores following Replace requests for that data. A Replace does not occur until the next Key, RBA, record number, or control interval statement is found.

Dump function

Prints the VSAM record or control interval (CIs).

The Dump function prints a dump for a part of a VSAM data set to the SYSPRINT output report.

A Dump is executed for the record or CI that is specified immediately before the Dump command. When a Dump is performed after a Replace, the Dump reflects the changes that are made by the Replace. If a Verify operation fails, the succeeding Dump operation is ignored.

You can use Verify, Replace, and Dump functions on all types of VSAM data sets:

- KSDS (key-sequenced data sets, including extended format KSDS and extended addressable KSDS)
- ESDS (entry-sequenced data sets, including extended format ESDS)
- LDS (linear data sets, including extended format LDS and extended addressable LDS)
- RRDS (relative-record data sets)

Typical uses

The batch version of IMS Database Repair Facility is used as follows:

- To perform Verify, Replace, and Dump operations in all types of VSAM data sets
- To access either individual records or the complete control interval
- To verify up to 36 bytes per Verify statement
- To replace up to 36 bytes per Replace statement
- To perform multiple Verify operations
- To perform multiple Replace operations
- To retrieve any number of records or control intervals with one run
- To satisfy data set security with a password control statement

Program structure

The batch version of IMS Database Repair Facility operates as a batch program in the MVS region. The utility is independent of IMS releases. It requires current VSAM support generated in the System Control Program, and runs in the current problem program state.

Restrictions

When you access a compressed data set with the batch version of IMS Database Repair Facility, the following restrictions apply:

- You cannot perform any IMS Database Repair Facility function by using the relative byte address of the control interval on the CNV control statement.
- You cannot perform the Replace function by using the relative byte address of the VSAM record on the RBA control statement.

However, you can perform all batch IMS Database Repair Facility functions, Verify, Replace, and Dump, using the fully qualified key of the VSAM record on the KEY control statement.

Modifying a VSAM data set

IMS Database Repair Facility consists of a single job step. To run it, you must specify the appropriate DD statements.

About this task

The general flow for the batch IMS Database Repair Facility is shown in the following figure.

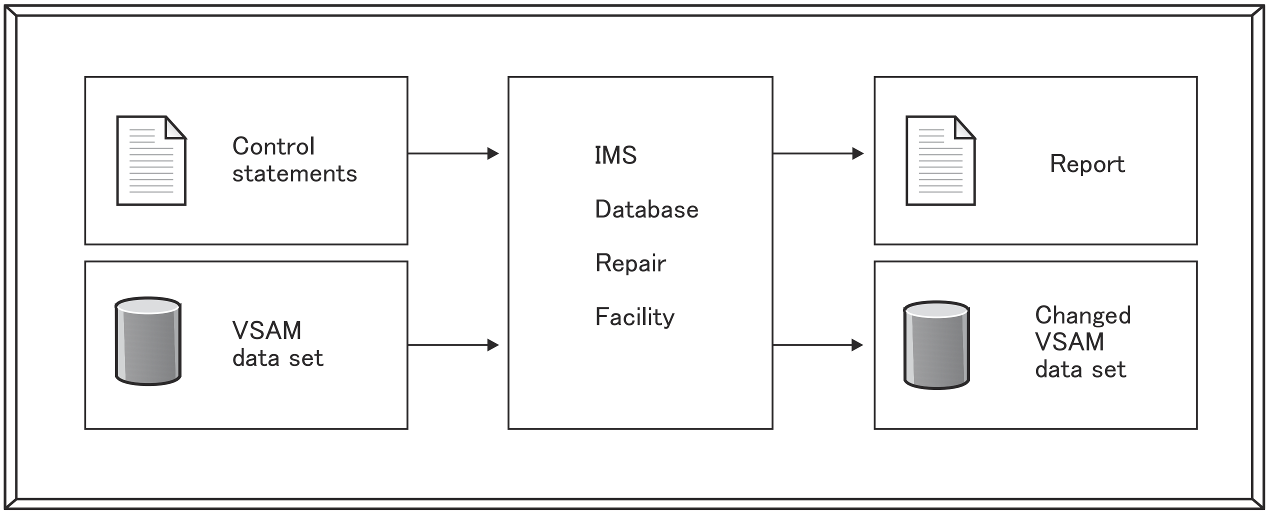


Figure 37. Data flow for batch IMS Database Repair Facility

Warning: Because IMS Database Repair Facility can change fields in *any* VSAM data set, ensure that you do not modify any data that would cause that data set to become unusable. An example of this would be the changing of a Key field in a KSDS record. Such a modification would cause that record to be unusable. In addition, because you can access KSDS index records and catalogs, some restrictions on the program's use are advised. Examples might be password protection of data sets or modification of the program to provide user security.

Procedure

You can run IMS Database Repair Facility as a batch job or from the console.

1. Decide what data you want to Verify, Replace, or Dump.
2. Code the EXEC and DD statements in the JCL.

   Use the following JCL example to code the JCL statements:

   ```
   //ZAP      JOB    (installation accounting information)
   //         EXEC   PGM=FABZVZAP
   //STEPLIB  DD     DSN=smphlq.SFABLMD0,DISP=SHR
   //SYSLIB   DD     DSN=DBT.VSAM,DISP=SHR
   //SYSPRINT DD     SYSOUT=A
   //SYSIN    DD     *
        (control statements)
   /*
   ```

   Specify the following DD statements. All the DD statements are required.

   STEPLIB DD

   Defines the program library where IMS Database Repair Facility resides.

   smphlq in the example specifies the high-level qualifier of your IMS Database Repair Facility load module library (SFABLMD0).

   SYSLIB DD

   Defines the VSAM data set that is to be processed by IMS Database Repair Facility.

SYSPRINT DD

Defines the sequential output message data set. It contains 133-byte fixed-length records. BLKSIZE, if coded, must be a multiple of 133. However, it is recommended that you use:

```
//SYSPRINT DD SYSOUT=A
```

If logical errors occur, they are displayed in the SYSPRINT DD data set following the control statement that caused the error. (VSAM records are printed using the IDCAMS utility PRINT function.)

After processing, the SYSPRINT data set contains a list of the processed control statements and all messages that are generated during control statement processing.

For more information about the data that is generated in the SYSPRINT data set, see "SYSPRINT data set" on page 54.

SYSIN DD

Defines the input data set that contains your control statements. This data set usually resides in the input stream. However, it can be defined either as a sequential data set or as a member of a partitioned data set. It must contain 80-byte fixed-length records. BLKSIZE, if coded, must be a multiple of 80.

3. Complete the following steps if you want to run IMS Database Repair Facility as a batch job.
   a) Code the control statements, and insert them in the JCL.

      If appropriate, consider the use of the CHECK control statement, which checks your control statements without updating the VSAM data set.

      For more information about the SYSIN control statements, see "SYSIN data set" on page 48.

   b) If appropriate, activate the password facility.

      If the password facility of VSAM is implemented on the system, it can be used to protect data set integrity. Even though the password facility protects password integrity, be careful in making changes, particularly in the key field in a KSDS data set.

   c) Run the job.

   d) Review the output messages to ensure that the job ran as planned.
4. Complete the following steps if you want to run IMS Database Repair Facility from the console.
   a) Include only the CONSOLE control statement in the JCL.

   b) Run the job.

   c) If appropriate, activate the password facility by entering the PSW control statement from the system console.

   d) Enter other control statements from the system console.

      For more information about the SYSIN control statements, see "SYSIN data set" on page 48.

   e) Enter an END control statement.

Related reference

Examples
The following topics provide control statement examples.

SYSIN data set

Input to the VSAM batch version of IMS Database Repair Facility consists of a VSAM data set and SYSIN control statements. The SYSIN data set contains the input control statements that describe the processing to be done by IMS Database Repair Facility.

Syntax rules

You must follow these rules when you write control statements in the SYSIN data set to run batch IMS Database Repair Facility to modify VSAM data sets.

Control statement order

The control statements must be grouped in the following order:

1. The optional CHECK control statement, if present, must be first.
2. The optional PSW control statement, if present, must follow the CHECK control statement. Or if there is no CHECK control statement, it must be the first control statement.
3. A control statement that defines the particular VSAM record or control interval that you want to process must be next. This statement can be a KEY, RBA, CNV, or NUM control statement.
4. Next, enter all VER control statements that refer to the record or control interval that is specified by the previous KEY, RBA, CNV, or NUM control statement. You should have a VER control statement that corresponds to each subsequent REP control statement.
5. All REP control statements that refer to the record or control interval that is specified by the previous KEY, RBA, CNV, or NUM control statement must be next.
6. All DUMP control statements that refer to the record or control interval that is specified by the previous KEY, RBA, CNV, or NUM control statement can be entered anywhere after the KEY, RBA, CNV, or NUM control statement. However, if a DUMP control statement follows a REP control statement, the image of a dump reflects the change that is made by the previous REP control statement.

You can have as many sets of control statements (as defined in terms 3, 4, 5, and 6) as you need.

General rules for control statements

Before you begin coding your control statements, there are several general rules with which you must be familiar:

- Control statement operands are positional, but they can begin in any column. Control statement operands must be separated by at least one blank.
- Hexadecimal numbers that are specified on CNV, KEY, NUM, and RBA control statements must resemble assembler language literals (for example, X'3F8000'). Hexadecimal numbers that are supplied on VER and REP control statements must not contain the X or the single quotes (for example, 3F8000). In either case, a hexadecimal number must be an even number of hexadecimal digits.
- The key on the KEY control statement can be specified as a character literal (for example, C'ABCD') or a hexadecimal expression (for example, X'C1C2C3C4'). When a key is specified in a single line of the KEY control statement, it can also be specified as a character string (for example, ABCD).
- Be careful in changing any field that is used by VSAM in controlling its data sets. IMS Database Repair Facility can access and change information that is important to the correct operation of VSAM.

PSW control statement

This statement specifies a password. If you are using a password for the VSAM data set, the PSW control statement must be the first control statement.

```
PSW password
```

password

The highest-level password that is required to process the VSAM data set that is identified by the SYSLIB DD statement.

KEY control statement

This statement specifies the physical record in a KSDS to be verified or changed.

The KEY control statement has two formats. When the key of a VSAM record can be specified in a single line, use this format:

```
KEY key
```

When the key of a VSAM record is too long to specify in one line, it can be specified using several lines as follows:

```
KEY continued-key,
continued-key,
 .
 .
continued-key
```

key

The fully qualified key of the VSAM record. It must be specified in a single line. It can be specified as any one of the following expressions:

- A character string (for example, ABCD)
- A character literal (for example, C'ABCD')
- A hexadecimal expression that consists of an even number of digits (for example, X'C1C2C3C4'). A leading zero must be added to an odd number of digits (for example, X'0FFFFF').

When a key is specified as a character literal and the key contains one or more single quotes ('), the quotes must be specified as two consecutive single quotes (''). When a key is specified as a character string, a blank cannot appear within a key field. When the data set key has one or more blanks, use the character literal or the hexadecimal format.

continued-key

The portion of the long VSAM key. The fully qualified key of the VSAM record can be specified on several lines using continued-keys. Continued-keys can be specified as either of the following expressions or a combination of the expressions:

- A character literal (for example, C'ABCD')
- A hexadecimal expression that consists of an even number of digits (for example, X'C1C2C3C4'). A leading zero must be added to an odd number of digits (for example, X'0FFFFF').

A character string must not be used.

The continued-key in each line must end with a comma (,) except for the last line. A comment can follow any continued-key separated by at least one blank, even when the continued-key ends with a comma.

The total length of the VSAM key that you specify on the KEY control statement must be equal to the length of the key for the data set. Otherwise, a logical error occurs.

RBA control statement

This statement specifies the position of the physical record in a KSDS or ESDS data set to be verified or changed.

```
RBA record_rba
```

record_rba

The relative byte address of the VSAM record. It can be specified as either of the following expressions:

- A decimal expression (for example, 4096). The allowable maximum value is 4294967295. Only for an extended addressable KSDS data set is the maximum value 140737488355327.

- A hexadecimal expression that consists of an even number of digits (for example, X'1000'). A leading zero must be added to an odd number of digits (for example, X'0100'). The allowable maximum value is X'FFFFFFFF'. Only for an extended addressable KSDS data set, the maximum value is X'7FFFFFFFFFFF'.

The size of an extended addressable KSDS data set must be less than the control interval (CI) size multiplied by 4 GB. For example, the 4 KB CI determines the maximum data set size as 16 TB; and the 32 KB CI, as 128 TB.

When you access a compressed data set, you cannot perform the Replace function by using the relative byte address of the VSAM record on the RBA control statement. You must avoid changing the length of stored records, which can happen when you use the Replace function for a compressed data set.

CNV control statement

This statement specifies the position of the control interval in the KSDS, ESDS, LDS, or RRDS data set to be verified, changed, or both.

```
CNV ci_rba
```

ci_rba

The relative byte address of the control interval. (Control interval RBAs have the same value as the RBA of the first record in the control interval). It can be specified with either of the following expressions:

- A decimal expression (for example, 4096). The allowable maximum value is 4294967295. Only for extended addressable KSDS data sets and extended addressable LDS data sets, the maximum value is 140737488355327.
- A hexadecimal expression that consists of an even number of digits (for example, X'1000'). A leading zero must be added to an odd number of digits (for example, X'010B00'). The allowable maximum value is X'FFFFFFFF'. Only for extended addressable KSDS data sets and extended addressable LDS data sets, the maximum value is X'7FFFFFFFFFFF'.

The size of extended addressable KSDS data set and extended addressable LDS data set must be less than the control interval (CI) size multiplied by 4 GB. For example, the 4 KB CI determines the maximum data set size as 16 TB; and the 32 KB CI, as 128 TB.

You cannot use the CNV control statement when you access a compressed data set.

NUM control statement

This statement specifies the position of the physical record in an RRDS data set to be verified, changed, or both.

```
NUM rel_rec_num
```

rel_rec_num

The relative record number of the VSAM record. It can be specified as either of the following expressions:

- A decimal expression (for example, 4096). The allowable maximum value is 4294967295.
- A hexadecimal expression that consists of an even number of digits (for example, X'FF'). A leading zero must be added to an odd number of digits (for example, X'0F'). The allowable maximum value is X'FFFFFFFF'.

VER control statement

This statement compares contents at a specific location in a physical record to data that you supply in the statement.

If the two data fields are not the same, the following REP operations do not occur. A REP does not occur until after the next CNV, KEY, RBA, or NUM control statement.

```
VER offset data
```

offset

The hexadecimal displacement of data to be inspected in the VSAM record that is defined by the last CNV, KEY, RBA, or NUM control statement. The displacement does not have to be on any special alignment. It must be specified with an even number of hexadecimal digits (for example, 0D, 021C, 014682).

If the offset value is greater than the record length, the VER operation does not occur.

data

Defines the bytes of data that is expected at the specified location. The number of bytes of data must be specified with an even number of hexadecimal digits (for example, F2C04682).

If all data that is to be verified does not fit on one 80-byte VER statement, use another VER statement.

REP control statement

This statement changes data in the physical record that is defined by the previous KEY, RBA, CNV, or NUM control statement.

Important:

- Data in the REP statement replaces data at the record location that is given in the offset parameter. Always use VER to verify the data before you use REP to change the data. A message that shows the replaced data is generated for each successful REP operation.
- REP and VER are interdependent in the performance of many tasks. Therefore, be sure to read all rules that pertain to the use of VER before you attempt to use REP control statements.
- Make sure that your corresponding VER and REP statements contain the same offset values. Otherwise, you might modify your VSAM data set incorrectly.
- When there are several VER and REP operations for one record, code all VER statements before coding the REP statements. (If one VER reject occurs, the program ignores all the REP operations for that KEY, RBA, CNV, or NUM control statement. Otherwise, the wrong data might be replaced).

```
REP offset data
```

offset

The hexadecimal displacement of data that is being replaced in the data record. The displacement does not have to address a fullword boundary. It must be specified with an even number of hexadecimal digits (for example, 0D, 021C, 014682).

If the offset is greater than the record length, the REP operation does not occur.

data

Defines the bytes of data that is inserted at the specified location. The data bytes must be specified with an even number of hexadecimal digits (for example, F2C04682).

If all data does not fit on one 80-byte REP statement, use another REP statement.

DUMP control statement

This statement prints a dump that refers to the record or control interval specified by the previous KEY, RBA, CNV, or NUM control statement.

When the DUMP control statement follows the REP control statement, the image of a dump reflects the changes that are made by the previous REP control statement.

```
DUMP
```

The DUMP control statement has no parameters.

CHECK control statement

This statement runs the zapper in CHECK mode. When zapper runs in CHECK mode, the statements that follow are run but the VSAM data is not updated.

The syntax of the KEY, RBA, CNV, and NUM control statements are checked, and if they are valid, actual data is read. Then, the syntax of the VER and REP control statements are checked and if they are valid, they are run against the data read. The result of the check is shown by messages. The check is done but the VSAM data is not updated. This functionality is called data check.

The DUMP control statement has no effect in CHECK mode.

```
CHECK
```

The CHECK control statement has no parameters.

Restrictions

Data check has the following restrictions:

- When the preceding KEY, RBA, CNV, or NUM control statements fails, the data check of the VER or REP control statements that follow is not done.
- When more than one KEY, RBA, CNV, or NUM control statements specify the same record or control interval, data check of the VER or REP statements following the second or later KEY, RBA, CNV, or NUM control statement is not done.
- When the KEY, RBA, or NUM control statement is used first, and later the CNV control statement is used, the data check of the VER or the REP statements following the CNV control statement is not done.

  Conversely, when the CNV control statement is used first, and later the KEY, RBA, or NUM control statements is used, the data check of the VER or the REP statements following the KEY, RBA, or NUM control statement is not done.
- When more than 1,000 KEY, RBA, NUM, or CNV control statements are used, the data check of the VER or the REP statements following the 1001st and subsequent KEY, RBA, NUM, or CNV statement are not done.

CONSOLE control statement

This statement indicates that you want to use the system console for input and output. When used, the CONSOLE statement is the only statement in the data stream. Enter all other control statements from the console.

```
CONSOLE
```

The CONSOLE control statement has no parameters.

END control statement

This statement stops an IMS Database Repair Facility job that is executed from the system console.

```
END
```

The END control statement has no parameters.

END is not valid in a statement input stream.

SYSPRINT data set

The SYSPRINT data set contains the Control Statements and Messages report that is produced by IMS Database Repair Facility.

In the Control Statements and Messages report, a message follows each VER operation. It shows the data on the data set at the specified offset. If the data matches, the REP that follows it takes place. If it does not match, all REPs and DUMPs are skipped until a new KEY, RBA, NUM, or CNV is located.

If the REP operation is successful, a message follows, that displays the data replaced on the data set. (This is a double check for the VER operation.) If the DUMP control statement is specified, a dump is printed for the record or control interval that is specified by the previous KEY, RBA, CNV, or NUM control statement.

The following figure shows an example of a Control Statements and Messages report.

```
IMS DB REPAIR FACILITY               (5655-E03)                "CONTROL STATEMENTS AND MESSAGES"                         PAGE:     1
VSAM ZAPPER                                                     DATE: 08/01/2020  TIME: 16.01.16                    FABZVZAP - V3.R1

 KEY C'001',                                :NO.1 RECORD KEY
     X'F0F1F2F3F4F5F6F7F8F9F0',
     C'AA'
   DUMP
 DUMP
       0 0000  F0F0F1F0 F1F2F3F4 F5F6F7F8 F9F0C1C1   F1F1F1F1 F1F1F1F1 F1F1F1F1 F1F1F1F1 *00101234567890AA1111111111111111*
      20 0020  F1F1F1F1 F1F1F1F1 F1F1F1F1 F1F1F1F1   F1F1F1F1 F1F1F1F1 F1F1F1F1 F1F1F1F1 *11111111111111111111111111111111*
     LINES  00000040-000000C0   SAME AS ABOVE
      E0 00E0  F1F1F1F1 F1F1F1F1 F1F1F1F1 F1F1F1F1   F1F1F1F1 F1F1F1F1 F1F1F1F1 F1F1F1C1 *1111111111111111111111111111111A*
     100 0100  C2C3C4C5 C6C70000 00000000 00000000   00000000 00000000 00000000 00000000 *BCDEFG..........................*
     120 0120  00000000 00000000 00000000 00000000   00000000 00000000 00000000 00000000 *................................*
     LINES  00000140-000001E0   SAME AS ABOVE
FABZ0008I DUMP COMPLETED

   VER FF   C1C2C3C4C5
FABZ0002I VERIFIED DATA IS : C1C2C3C4C5

   REP FF   F1D4C1E2C1D2D6
FABZ0001I OLD DATA WAS : C1C2C3C4C5C6C7

   DUMP
 DUMP
       0 0000  F0F0F1F0 F1F2F3F4 F5F6F7F8 F9F0C1C1   F1F1F1F1 F1F1F1F1 F1F1F1F1 F1F1F1F1 *00101234567890AA1111111111111111*
      20 0020  F1F1F1F1 F1F1F1F1 F1F1F1F1 F1F1F1F1   F1F1F1F1 F1F1F1F1 F1F1F1F1 F1F1F1F1 *11111111111111111111111111111111*
     LINES  00000040-000000E0   SAME AS ABOVE
     100 0100  D4C1E2C1 D2D60000 00000000 00000000   00000000 00000000 00000000 00000000 *MASAKO..........................*
     120 0120  00000000 00000000 00000000 00000000   00000000 00000000 00000000 00000000 *................................*
     LINES  00000140-000001E0   SAME AS ABOVE
FABZ0008I DUMP COMPLETED



FABZ0007I COMPLETED WITH HIGHEST RETURN CODE :     0
```

Figure 38. Control Statements and Messages report

Examples

The following topics provide control statement examples.

Example 1: Repairing a VSAM data set interactively from the console

The following figure shows example control statements to designate console as input source.

```
//ZAP       JOB     (installation accounting information)
//CONSTEP   EXEC    PGM=FABZVZAP
//STEPLIB   DD      DSNAME=DBT.SFABLMD0,DISP=SHR
//SYSLIB    DD      DSNAME=DBT.VSAM,DISP=OLD
//SYSPRINT DD       SYSOUT=A
//SYSIN     DD      *
    CONSOLE
/*
```

Figure 39. Example of designating console as input source

- CONSOLE must be the only statement for SYSIN data set in the job stream.
- Other IMS Database Repair Facility control statements must be entered from the console.
- END must be the last entry on the console.

Example 2: Control statements to repair a VSAM KSDS data set

The following figure shows example control statements to repair a VSAM KSDS data set.

```
//ZAP      JOB     (installation accounting information)
//KSDSTEP  EXEC    PGM=FABZVZAP
//STEPLIB  DD      DSNAME=DBT.SFABLMD0,DISP=SHR
//SYSLIB   DD      DSNAME=DBT.KSDS,DISP=OLD
//SYSPRINT DD      SYSOUT=A
//SYSIN    DD      *
    PSW KSDSPASS
    KEY MYABC
      VER 00 0000
      VER 2D C1C2C3
      REP 00 47F0
      REP 2D D1D2D3
    KEY X'F1F3F540'
      VER 1C 47F0
      REP 1C 4780
    KEY C'FIRSTRECORD,FIRSTRECORD,FIRSTRECORD',
    X'0102030405060708090A0B0C0D0F1F2F',
    C'RECORDCONTINUERECORD CONTINUERECORD'
      VER 2C 47F0
      REP 2C 4780
    RBA 140
      VER 10 4780
      REP 10 4700
    RBA X'F2F0F0'
      VER 8A 5810555C
      REP 8A 5830555C
    CNV 14350
      VER 30 F1F2F5F6
      REP 30 F9F9F9F9
    CNV X'F1F3F8F8'
      VER 26 4770
      REP 26 47F0
/*
//
```

Figure 40. Example of repairing a VSAM KSDS data set

- If you use a password statement (PSW control statement), the statement must be first in the series of control statements.
- KSDS records can be addressed by KEY, RBA, and CNV control statements.
- RBA and CNV numbers can be expressed in either decimal or hexadecimal.
- KEY can be expressed in any of character string, character literal, and hexadecimal formats when it is coded in a single line. When a long KEY is specified using several lines, it can be expressed in character literal or hexadecimal format or a combination of both.

Example 3: Control statements to repair a VSAM ESDS data set

The following figure shows example control statements to repair a VSAM ESDS data set.

```
//ZAP      JOB     (installation accounting information)
//ESDSTEP  EXEC    PGM=FABZVZAP
//STEPLIB  DD      DSNAME=DBT.SFABLMD0,DISP=SHR
//SYSLIB   DD      DSNAME=DBT.ESDS,DISP=OLD
//SYSPRINT DD      SYSOUT=A
//SYSIN    DD      *
    PSW ESDSPASS
    RBA 140
      VER 10 4780
      REP 10 4700
    RBA X'F2F0F0'
      VER 8A 5810555C
      REP 8A 5830555C
    CNV 14350
      VER 30 F1F2F5F6
      REP 30 F9F9F9F9
    CNV X'F1F3F8F8'
      VER 26 4770
      REP 26 47F0
/*
//
```

Figure 41. Example of repairing a VSAM ESDS data set

- If you use a password statement (PSW control statement), the statement must be first in the series of control statements.
- ESDS records can be addressed by both RBA and CNV control statements.
- RBA and CNV can be expressed in either decimal or hexadecimal characters.

Example 4: Control statements to repair a VSAM RRDS data set

The following figure shows example control statements to repair a VSAM RRDS data set.

```
//ZAP      JOB     (installation accounting information)
//RRDSTEP  EXEC    PGM=FABZVZAP
//STEPLIB  DD      DSNAME=DBT.SFABLMD0,DISP=SHR
//SYSLIB   DD      DSNAME=DBT.RRDS,DISP=OLD
//SYSPRINT DD      SYSOUT=A
//SYSIN    DD      *
    PSW RRDSPASS
    NUM 140
      VER 10 4780
      REP 10 4700
    NUM X'F2F0F0'
      VER 8A 5810555C
      REP 8A 5830555C
    CNV 14350
      VER 30 F1F2F5F6
      REP 30 F9F9F9F9
    CNV X'F1F3F8F8'
      VER 26 4770
      REP 26 47F0
/*
//
```

Figure 42. Example of repairing a VSAM RRDS data set

- If you use a password statement (PSW control statement), the statement must be first in the series of control statements.
- RRDS records can be addressed by both NUM and CNV control statements.
- NUM and CNV can be expressed in either decimal or hexadecimal.

Example 5: Control statements to get a DUMP of a record or CI

The following figure shows example control statements to get a DUMP of a record or CI. This example is for a KSDS data set.

```
//ZAP      JOB     (installation accounting information)
//KSDSTEP  EXEC    PGM=FABZVZAP
//STEPLIB  DD      DSNAME=DBT.SFABLMD0,DISP=SHR
//SYSLIB   DD      DSNAME=DBT.KSDS,DISP=OLD
//SYSPRINT DD      SYSOUT=A
//SYSIN    DD      *
    RBA 140
      VER 10 4780
      REP 10 4700
      DUMP
    KEY C'MYABC',
    C'SECONDRECORD',
    X'E1E2F5F6F8F9'
      DUMP
    CNV X'2000'
      DUMP
/*
//
```

Figure 43. Example of getting a DUMP of a record or CI

- For a KSDS data set, specify the DUMP control statement after the KEY, RBA, or CNV control statement.
- For an ESDS data set, specify the DUMP control statement after the RBA or CNV control statement.
- For an RRDS data set, specify the DUMP control statement after the NUM or CNV control statement.
- The DUMP control statement after a KEY, RBA, or NUM control statement prints a dump for one record of the data set.
- The DUMP control statement after a CNV control statement prints a dump for one CI of the data set.

Example 6: Control statements to repair a VSAM extended addressable KSDS data set

The following figure shows example control statements to repair a VSAM extended addressable KSDS data set.

```
//ZAP      JOB     (installation accounting information)
//KSDSTEP  EXEC    PGM=FABZVZAP
//STEPLIB  DD      DSNAME=DBT.SFABLMD0,DISP=SHR
//SYSLIB   DD      DSNAME=DBT.EAKSDS,DISP=OLD
//SYSPRINT DD      SYSOUT=A
//SYSIN    DD      *
    PSW KSDSPASS
    KEY MYABC
      VER 00 0000
      VER 2D C1C2C3
      REP 00 47F0
      REP 2D D1D2D3
    KEY X'F1F3F540'
      VER 1C 47F0
      REP 1C 4780
    RBA 4294967552
      VER 10 4780
      REP 10 1700
    RBA X'0100000200'
      VER 8A 5810555C
      REP 8A 5830555C
    CNV 4295000064
      VER 30 F1F2F5F6
      REP 30 F9F9F9F9
    CNV X'0100000600'
      VER 26 4770
      REP 26 4770
/*
//
```

Figure 44. Example of repairing a VSAM extended addressable KSDS data set

- Extended addressable KSDS records can be addressed by the KEY, RBA, and CNV control statements.
- The RBA and CNV numbers can be expressed in either decimal or hexadecimal and both can exceed 4 GB.

Example 7: Control statements to repair a VSAM LDS data set

The following figure shows example control statements to repair a VSAM extended addressable LDS data set.

```
//ZAP      JOB     (installation accounting information)
//RRDSTEP  EXEC    PGM=FABZVZAP
//STEPLIB  DD      DSNAME=DBT.SFABLMD0,DISP=SHR
//SYSLIB   DD      DSNAME=DBT.LDS,DISP=OLD
//SYSPRINT DD      SYSOUT=A
//SYSIN    DD      *
    CNV 49152
      VER 2D C1C2C3
      REP 2D D1D2D3
    CNV X'C000'
      VER 1C 47F0
      REP 1C 4780
    CNV 4294983680
      VER 8A F1F2F5F6
      REP 8A F9F9F9F9
    CNV X'0100004000'
      VER 10 4770
      REP 10 4780
/*
//
```

Figure 45. Example of repairing a VSAM extended addressable LDS data set

- LDS records can be addressed by CNV control statements.
- CNV numbers can be expressed in either decimal or hexadecimal and both can exceed 4 GB.

Chapter 4. Repairing OSAM data sets in batch mode

You can run IMS Database Repair Facility in batch mode to modify OSAM data sets.

In the following topics, whenever the term IMS Database Repair Facility appears without qualification, it refers to IMS Database Repair Facility running in batch mode.

Topics:

- "Overview of batch IMS Database Repair Facility for OSAM" on page 59
- "Modifying an OSAM data set" on page 60
- "SYSIN data set" on page 62
- "SYSTSPRT data set" on page 65

Overview of batch IMS Database Repair Facility for OSAM

An important feature of the batch version of IMS Database Repair Facility is that you can use it to modify IMS data sets.

The OSAM batch version of IMS Database Repair Facility operates in a similar manner as the VSAM batch program.

You can specify the data to change by supplying the following information to IMS Database Repair Facility:

- Relative byte address (RBA)
- Block number

The SYSIN data set contains the control statements, and messages and output are sent to the SYSTSPRT data set.

Functions

The batch version of IMS Database Repair Facility supports the following three functions:

Verify function

Compares data before changing the data.

The Verify function compares the data at a specific location in an OSAM data set to data that you supply.

Recommendation: To eliminate the possibility of changing good data, consider performing a Verify operation before a Replace operation.

Replace function

Changes data.

The Replace function changes the data at a specific location in an OSAM data set with data that you supply.

Recommendation: To eliminate the possibility of changing good data, always perform a Verify operation before a Replace operation. If data does not match during a Verify operation, the Replace is canceled. However, you can do a Replace without a preceding Verify.

Dump function

Prints the record.

The Dump function prints a dump of the OSAM data set block to the SYSTSPRT output report.

A Dump is executed for the block that is specified immediately before the Dump command. When a Dump is performed after a Replace, the Dump reflects the changes that are made by the Replace.

Any error causes the job to end.

Typical uses

The batch version of IMS Database Repair Facility is used as follows:

- To perform Verify, Replace, and Dump operations in all types of OSAM data sets
- To perform multiple Verify operations
- To perform multiple Replace operations
- To retrieve any number of blocks with one run

Program structure

The batch version of IMS Database Repair Facility operates as a batch program in the MVS region. The utility is independent of IMS releases.

Modifying an OSAM data set

IMS Database Repair Facility consists of a single job step. To run it, you must specify the appropriate DD statements.

About this task

The general flow for the batch IMS Database Repair Facility is shown in the following figure.

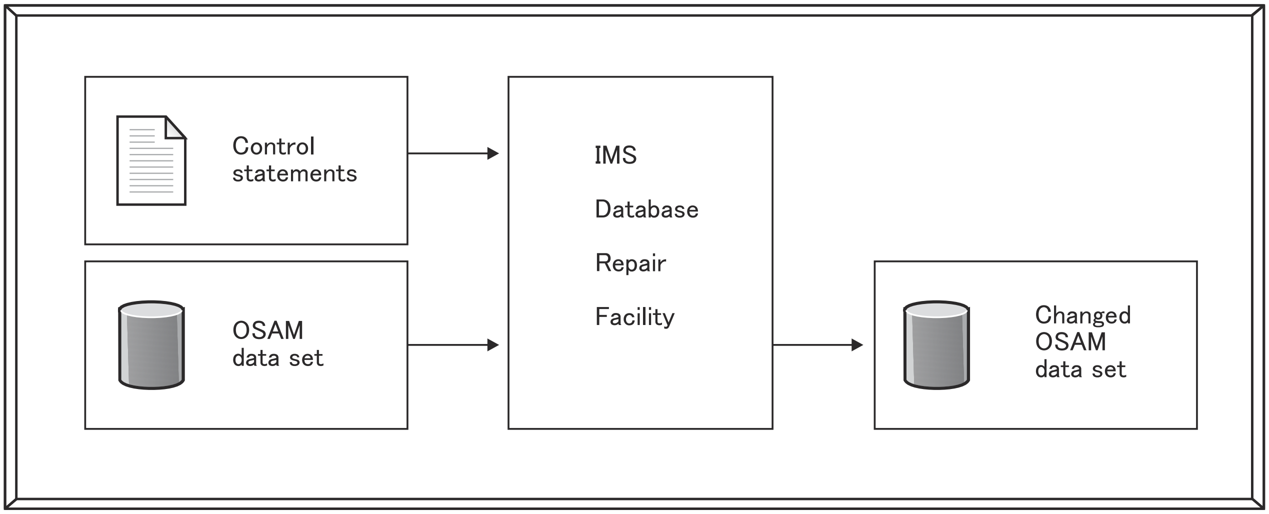


Figure 46. Data flow for batch IMS Database Repair Facility

Procedure

1. Decide what data you want to Verify, Replace, or Dump.
2. Code the EXEC and DD statements in the JCL.

   Use the following JCL example to code the JCL statements. All statements in the example are required.

   ```
   //DBRFOBT4 JOB (installation accounting information)
   //*
   //BATCHTSO EXEC PGM=IKJEFT1B,DYNAMNBR=25,REGION=0M,COND=EVEN
   //*
   //SYSLIB   DD DISP=OLD,DSNAME=DBT.HPPC.DB.DSFACHO0
   //SYSEXEC  DD DISP=SHR,DSN=smphlq.SFABCLIB
   //*
   //ISPPLIB  DD   DISP=SHR,DSN=ISP.SISPPENU
   //ISPMLIB  DD   DISP=SHR,DSN=ISP.SISPMENU
   //ISPSLIB  DD   DISP=SHR,DSN=ISF.SISFSLIB
   //ISPTLIB  DD   DISP=SHR,DSN=ISP.SISPTENU
   //ISPLOG   DD SYSOUT=*,DCB=(LRECL=125,BLKSIZE=129,RECFM=VA)
   ```

```
//ISPPROF  DD DSN=&TEMP1,DISP=(NEW,PASS),UNIT=SYSALLDA,
//         SPACE=(CYL,(3,10,15)),DCB=(LRECL=80,BLKSIZE=3120,RECFM=FB)
//SYSTSPRT DD SYSOUT=*
//SYSTSIN  DD *
  PROFILE PREFIX(userid)
  ISPSTART CMD(FABZOSMB smphlq workhlq workmlq debug)
/*
//SYSIN    DD *
     (control statements)
/*
```

Specify the following DD statements.

SYSLIB DD

Defines the OSAM data set that is to be processed by IMS Database Repair Facility.

SYSEXEC DD

Defines the REXX procedure library of IMS Database Repair Facility (SFABCLIB).

ISPPLIB, ISPMLIB, ISPSLIB, ISPTLIB, ISPPROF, ISPLOG DD

Except for the ISPLOG DD statement, all these DD statements are required. These DD statements specify the ISPF data sets. For more information about these DD statements, see the *z/OS ISPF User's Guide, Volume 1*.

SYSTSPRT DD

Defines the sequential output message data set. It contains 133-byte fixed-length records. BLKSIZE, if coded, must be a multiple of 133. However, it is recommended that you use:

```
//SYSTSPRT DD SYSOUT=A
```

If logical errors occur, they are printed in the SYSTSPRT DD data set following the control statement that caused the error.

After processing, the SYSTSPRT data set contains a list of the processed control statements and all messages that are generated during control statement processing.

If any operation fails, the program exits and subsequent SYSIN cards are ignored.

For more information about the data that is generated in the SYSTSPRT data set, see "SYSTSPRT data set" on page 65.

SYSTSIN DD

Defines the input data set that contains the PROFILE and ISPSTART commands and their parameters. The PROFILE command is optional but the ISPSTART command is required. The PROFILE command must precede the ISPSTART command.

```
//SYSTSIN  DD   *
  PROFILE PREFIX(userid)
  ISPSTART CMD(FABZOSMB smphlq workhlq workmlq debug)
/*
```

userid

Optional. Specifies the prefix portion for the data set names that are used by ISPF. If the *userid* is defined to RACF®, instead of specifying the PROFILE PREFIX(*userid*) statement, you can specify the USER=*userid* parameter on the JOB statement.

smphlq

Required. Specifies the high-level qualifier of the IMS Database Repair Facility load module library (SFABLMD0).

workhlq

Required. Specifies the high-level qualifier for the work data sets that are used by IMS Database Repair Facility.

workmlq

Required. Specifies the middle-level qualifier for the work data sets that are used by IMS Database Repair Facility.

debug

Optional. Code this parameter only for debugging purposes.

To report problems to IBM for diagnosis, set this parameter to 1 to turn on the debug trace, rerun the failing job, and send the job log to IBM.

SYSIN DD

Defines the input data set that contains your control statements. This data set usually resides in the input stream. However, it can be defined either as a sequential data set or as a member of a partitioned data set. It must contain 80-byte fixed-length records. BLKSIZE, if coded, must be a multiple of 80.

3. Code the SYSIN control statements and insert them in the JCL.

   If appropriate, consider the use of the CHECK control statement, which checks your control statements without updating the OSAM data set.

   The following figure shows an example of the SYSIN control statements:

   ```
   //SYSIN    DD *
     OBLK 2
     DUMP
     VER 0020 F9C3C4E9
     VER 0024 C2C3D9C4
     REP 0020 F9C4C4E9
     REP 0024 C2C4D9C4
     DUMP
   /*
   ```

   For more information about the SYSIN control statements, see "SYSIN data set" on page 62.
4. Run the job.
5. Review the output messages to ensure that the job ran as planned.

SYSIN data set

Input to the OSAM batch version of IMS Database Repair Facility consists of an OSAM data set and SYSIN control statements. The SYSIN data set contains the input control statements that describe the processing to be done by IMS Database Repair Facility.

Syntax rules

You must follow these rules when you write control statements in the SYSIN data set to run batch IMS Database Repair Facility to modify OSAM data sets.

Control statement order

The control statements must be grouped in the following order:

1. The CHECK control statement, if present, must be first.
2. A control statement that defines the particular OSAM block that you want to process must be next. This statement can be an ORBA or OBLK control statement.
3. Next, enter all VER control statements that refer to the block specified by the previous ORBA or OBLK control statement. You should have a VER control statement that corresponds to each subsequent REP control statement.
4. All REP control statements that refer to the record or control interval that is specified by the previous ORBA or OBLK control statement must be next.
5. All DUMP control statements that refer to the block specified by the previous ORBA or OBLK control statement can be entered anywhere after the ORBA or OBLK control statement. However, if a DUMP control statement follows a REP control statement, the image of a dump reflects the change that is made by the previous REP control statement.

You can have as many sets of control statements (as defined in items 2, 3, 4, and 5) as you need.

General rules for control statements

Before you begin coding your control statements, there are several general rules with which you must be familiar:

- Control statement operands are positional, but they can begin in any column. Control statement operands must be separated by at least one blank.
- Hexadecimal numbers that are specified on ORBA or OBLK control statements must look like assembler language literals (for example, X'3F8000'). Hexadecimal numbers that are supplied on VER and REP control statements must not contain the X or the single quotation marks (for example, 3F8000). In either case, a hexadecimal number must be an even number of hexadecimal digits.
- When the first non-blank character of a line is an asterisk (*), the line is processed as a comment. The asterisk is not required to be in column 1.
- Blank lines are allowed and processed as comments. A blank line contains spaces in columns 1 - 72. Columns 73 - 80 can contain anything, for example, sequence numbers.

ORBA control statement

This statement specifies the position of the physical record in one OSAM data set to be verified or changed.

```
ORBA record_rba
```

record_rba

The relative byte address of the OSAM record. It can be specified as either of the following expressions:

- A decimal expression (for example, 4096). The allowable maximum value is 8589934591.
- A hexadecimal expression (for example, X'1000'). The allowable maximum value is X'1FFFFFFFF'.

  If the database is an HDAM or HIDAM and the database data set is OSAM with even block size or if the database is a PHDAM or PHIDAM that is registered in the RECON data sets as a database that supports up to 8 GB of data, the maximum database size can be 8 GB. An RBA beyond 4 GB for the OSAM database data set can be specified in hexadecimal format by the following expressions:

  - A nine-digit value. Add a 1 at the beginning of the RBA value. For example, to specify an RBA value of 4294968320, you enter 100000400. The maximum value is X'1FFFFFFFF'.
  - An eight-digit value. Increment the last bit of the RBA value by 1. For example, to specify an RBA value of 4294968320, you enter 00000401. The maximum value is X'FFFFFFFF'.

  When either of these values is supplied, IMS Database Repair Facility assumes that the value is over 4 GB for the even-block size OSAM.

  Note: A nine-digit RBA is used only when you enter the value. IMS Database Repair Facility shows the RBA value in eight digits.

OBLK control statement

This statement specifies the position of the block in an OSAM data set to be verified, changed, or both.

```
OBLK block_number
```

block_number

The relative byte address of the block. It can be specified with decimal expression (for example, 4096). The allowable maximum value is 4294967295.

VER control statement

This statement compares contents at a specific location in a physical record to data that you supply in the statement.

If the two data fields are not the same, the job ends.

```
VER offset data
```

offset

The hexadecimal displacement of data to be inspected in the OSAM record that is defined by the last OBLK or ORBA control statement. The displacement does not have to be on any special alignment. It must be specified with an even number of hexadecimal digits (for example, 0D, 021C, 014682).

If the offset value is greater than the record length, the VER operation does not occur.

data

Defines the bytes of data that is expected at the specified location. The number of bytes of data must be specified with an even number of hexadecimal digits (for example, F2C04682).

If all data that is being verified does not fit on one 80-byte VER statement, use another VER statement.

REP control statement

This statement changes data in the physical record that is defined by the previous OBLK or ORBA control statement. Data in the REP statement replaces data at the record location that is given in the offset parameter.

Important:

- Always use VER to verify the data before you use REP to change the data.
- REP and VER are interdependent in the performance of many tasks. Therefore, be sure to read all rules that pertain to the use of VER before you attempt to use REP control statements.
- Make sure that your corresponding VER and REP statements contain the same offset values. Otherwise, you might modify your OSAM data set incorrectly.
- When there are several VER and REP operations for one record, code all VER statements before the REP statements.

```
REP offset data
```

offset

The hexadecimal displacement of data that is being replaced in the data record. The displacement does not have to address a fullword boundary. It must be specified with an even number of hexadecimal digits (for example, 0D, 021C, 014682).

If the offset is greater than the record length, the REP operation does not occur.

data

Defines the bytes of data that is inserted at the specified location. The data bytes must be specified with an even number of hexadecimal digits (for example, F2C04682).

If all data does not fit on one 80-byte REP statement, use another REP statement.

DUMP control statement

This statement prints a dump that refers to the record or control interval that is defined by the previous OBLK or ORBA control statement.

When the DUMP control statement follows the REP control statement, the image of a dump reflects the changes that are made by the previous REP control statement.

```
DUMP
```

The DUMP control statement has no parameters.

CHECK control statement

This statement runs the zapper in CHECK mode. When zapper runs in CHECK mode, the statements that follow are run but the OSAM data set is not updated.

The syntax of the ORBA and the OBLK control statements are checked, and if they are valid, actual data is read. Then, the syntax of the VER and the REP control statements are checked and if they are valid, they are run against the data read. The result of the check is shown by messages. The check is done but the OSAM data is not updated. This functionality is called data check.

The DUMP control statement has no effect in CHECK mode.

```
CHECK
```

The CHECK control statement has no parameters.

Restrictions

Data check has the following restrictions:

- When the preceding ORBA or OBLK control statements fails, the data check of the VER or REP control statements that follow is not done.
- When more than one ORBA or OBLK control statement specifies the same record, the data check of the VER or REP statements that follow the second or later ORBA or OBLK control statements is not done.

SYSTSPRT data set

The SYSTSPRT data set contains the Control Statements and Messages report that is produced by IMS Database Repair Facility.

The following figure shows an example of the Control Statements and Messages report.

```
READY
  PROFILE PREFIX(DBT)
READY
  ISPSTART CMD(FABZOSMB    DBT.DBRUT.FABZ310G DBT FABZ  )

 Database Repair - Version 3.1

SYSIN CARD=  OBLK 2
SYSIN CARD=  DUMP
....ofst =0000
....data =03F40000 0000115C 01000000 00020000  00000000 11900000 0D700000 146CC1
....datac=  4            *                                                  % A
....ofst =0020
....data =F9C3C4E9 C2C3D9C4 6B40C7C5 D6D9C7C5  40404040 40404040 40404040 030000
....datac=9 C D Z  B C R D  ,   G E  O R G E
....ofst =0040
....data =00000000 00000000 0D3CF8F0 F1F2F0F5  40E540E5 40E540E5 40E540E5 40E540
....datac=                      8 0  1 2 0 5     V   V    V   V    V   V    V

SYSIN CARD=  VER 0020 F9C3C4E9
FABZ901I VER worked
SYSIN CARD=  VER 0024 C2C3D9C4
FABZ901I VER worked
SYSIN CARD=  REP 0020 F9C4C4E9
FABZ902I REP worked
SYSIN CARD=  REP 0024 C2C4D9C4
FABZ902I REP worked
```

Figure 47. Control statements and messages report

Chapter 5. Repairing HALDB databases by using the ILK Repair utility

If you identify corrupted HALDB partition reorganization numbers, duplicate ILKs, or potentially duplicate ILKs in your HALDB databases, you must correct them because these problems can cause data loss.

To repair such errors, use the HD Pointer Checker utility of IMS HP Pointer Checker and the ILK Repair utility. The HD Pointer Checker utility generates repair information records in a data set that you use as input to the ILK Repair utility. The ILK Repair utility corrects the errors in the HALDB databases, all the databases that are logically related, and PSINDEX databases.

For more information, see the topic "Repairing HALDB partition reorganization numbers and duplicate ILKs" in the *IMS High Performance Pointer Checker User's Guide*.

Topics:

- “Running the ILK Repair utility” on page 67
- “ILK Repair utility reports” on page 69

Running the ILK Repair utility

Run the ILK Repair utility to repair corrupted HALDB partition reorganization numbers, duplicate ILKs, and potentially duplicate ILKs in HALDB databases. The utility also repairs such errors in the logically related databases and PSINDEX databases at the same time.

Before you begin

This utility requires the repair information records that are created by the HD Pointer Checker utility of IMS HP Pointer Checker. Complete the instructions in the topic "Repairing HALDB partition reorganization numbers and duplicate ILKs" in the *IMS High Performance Pointer Checker User's Guide*.

Procedure

1. Specify the JOB and the EXEC statements.

   Define the JOB and the EXEC statements in the utility JCL. Code the EXEC statement as follows:

```
//         EXEC PGM=IKJEFT1B,DYNAMNBR=25
```

2. Specify the DD statements.

   Define the DD statements in the utility JCL. Use the following JCL example to code the JCL statements:

```
//DBRFZAP JOB (installation accounting information)
//*
//BATCHTSO EXEC PGM=IKJEFT1B,DYNAMNBR=25
//*
//SYSEXEC DD DISP=SHR,DSN=smphlq.SFABCLIB
//*
//ISPPLIB DD DISP=SHR,DSN=ISP.SISPPENU
//ISPMLIB DD DISP=SHR,DSN=ISP.SISPMENU
//ISPSLIB DD DISP=SHR,DSN=ISF.SISFSLIB
//ISPTLIB DD DISP=SHR,DSN=ISP.SISPTENU
//ISPLOG DD SYSOUT=*,DCB=(LRECL=125,BLKSIZE=129,RECFM=VA)
//ISPPROF DD DISP=(NEW,PASS),DSN=&TEMP,
// UNIT=SYSALLDA,SPACE=(CYL,(3,10,15)),
// DCB=(LRECL=80,BLKSIZE=3120,RECFM=FB)
//*
//SYSTSPRT DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//*
//SYSTSIN DD *
  PROFILE PREFIX(userid)
  ISPSTART CMD(FABZREPR smphlq workhlq workmlq debug)
```

```
/*
//FABZIN DD DISP=SHR,DSN=HPS.HDPC.FABPILK
```

The following DD statements are supported:

SYSEXEC

Required. Defines the REXX procedure library of IMS Database Repair Facility (SFABCLIB).

SYSTSIN DD

Required. Defines the input data set that contains the PROFILE and ISPSTART commands and their parameters. The PROFILE command is optional but the ISPSTART command is required. The PROFILE command must precede the ISPSTART command.

```
//SYSTSIN  DD   *
 PROFILE PREFIX(userid)
 ISPSTART CMD(FABZREPR smphlq workhlq workmlq debug)
/*
```

userid

Optional. Specifies the prefix portion for the data set names that are used by ISPF. If the *userid* is defined to RACF, instead of specifying the PROFILE PREFIX(*userid*) statement, you can specify the USER=*userid* parameter on the JOB statement.

smphlq

Required. Specifies the high-level qualifier of the IMS Database Repair Facility load module library (SFABLMD0).

workhlq

Required. Specifies the high-level qualifier for the work data sets that are used by IMS Database Repair Facility.

workmlq

Required. Specifies the middle-level qualifier for the work data sets that are used by IMS Database Repair Facility.

debug

Optional. Code this parameter only for debugging purposes.

To report problems to IBM for diagnosis, set this parameter to 1 to turn on the debug trace, rerun the failing job, and send the job log to IBM.

FABZIN

Required. Specifies the input data set, which is the FABPILK data set that is created by the HD Pointer Checker utility.

SYSTSPRT DD

Required. Specifies the output data set for the Control Statements and Messages report. This report contains the result of the job, and when OSAM data sets are processed, it also contains the process logs, and messages. This data set contains 133-byte fixed-length records. BLKSIZE, if coded, must be a multiple of 133. However, it is recommended that you use:

```
//SYSTSPRT DD SYSOUT=A
```

SYSPRINT

Required. Specifies the output data set for the Control Statements and Messages report. This report contains the process logs and messages for VSAM data sets. This data set contains 133-byte fixed-length records. BLKSIZE, if coded, must be a multiple of 133. However, it is recommended that you use:

```
//SYSPRINT DD SYSOUT=A
```

ISPPLIB, ISPMLIB, ISPSLIB, ISPTLIB, ISPPROF, ISPLOG DD

Except for the ISPLOG DD statement, all these DD statements are required. These DD statements specify the ISPF data sets. For more information about these DD statements, see the *z/OS ISPF User's Guide, Volume 1*.

3. Submit the job.

4. Ensure that the job completed successfully by locating the FABZ800I message in the Control Statements and Messages report in the SYSTSPRT data set. This message indicates the successful completion of the job.
5. In the Control Statements and Messages report in the SYSTSPRT data set and the SYSPRINT data set, locate the following indicator:

   ```
   * DBNAME: dbdname  PARTNAME: partname DSG:  A
   * DS NAME: dataset_name
   ***********************************************
   * THE ILDS MUST BE REBUILT FOR THIS PARTITION *
   ***********************************************
   ```

   This indicator notifies you the HALDB partition whose indirect list data sets (ILDSs) must be rebuilt. Locate all the indicators in the reports and make a list of the partitions whose ILDSs must be rebuilt. You will use this list in the subsequent repair process.

What to do next

Continue with the repair procedure described in the topic "Repairing HALDB partition reorganization numbers and duplicate ILKs" in the *IMS High Performance Pointer Checker User's Guide*.

ILK Repair utility reports

The ILK Repair utility generates the Control Statements and Messages reports in the SYSTSPRT and the SYSPRINT data sets.

The report in the SYSTSPRT data set contains the result of the job, and when OSAM data sets are processed, it also contains the process logs and messages that are issued during the job. The report in the SYSPRINT data set is generated only when VSAM data sets are processed, and it contains the process logs and messages that were issued during the job.

SYSTSPRT data set

The following figure shows an example of the report.

```
READY
 PROFILE PREFIX(DBT)
READY
 ISPSTART CMD(FABZREPR HPS DBT FABZ)

 Database Repair - Version 3.1 - PM97585

FABZIN CARD=* DBNAME: TPFOH1   PARTNAME: TPFOH1A  DSG:  A
FABZIN CARD=* DS NAME: TESTDS.PUBLIC.SAMPLE.TPFOH1.A00001
FABZIN CARD=***********************************************
FABZIN CARD=* THE ILDS MUST BE REBUILT FOR THIS PARTITION *
FABZIN CARD=***********************************************
FABZIN CARD=
FABZIN CARD= ORBA X'0800'
FABZIN CARD= REP 00000002 0005
FABZ953I Old data was : 0002
FABZ902I REP worked
FABZIN CARD=
FABZIN CARD= ORBA X'1800'
FABZIN CARD= REP 00000032 0000181800010004
FABZ953I Old data was : 00001818000100022
FABZ902I REP worked
FABZIN CARD= ORBA X'00005000'
FABZIN CARD= REP 00000032 0000501800010004
FABZ953I Old data was : 0000181800010002
FABZ902I REP worked

FABZ808I ZAP FOR THE DATA SET ENDED WITH RC=00

FABZ800I DBRF ENDED NORMALLY

READY
END
```

SYSPRINT data set

The following figure shows an example of the report.

```
IMS DB REPAIR FACILITY               (5655-E03)           "CONTROL STATEMENTS AND MESSAGES"                              PAGE:     1
VSAM ZAPPER                                                DATE: 07/31/2020  TIME: 13.22.21                         FABZVZAP - V3.R1

* DBNAME: PHIMDB1  PARTNAME: PHIMD1A  DSG:  A
* DS NAME: TESTDS.PUBLIC.SAMPLE.TPFOH1.A00001
***********************************************
* THE ILDS MUST BE REBUILT FOR THIS PARTITION *
***********************************************

 RBA X'0800'
 REP 00000002 0005
FABZ0001I OLD DATA WAS : 0002

 RBA X'0000A800'
 REP 00000704 0000AEDA00010004
FABZ0001I OLD DATA WAS : 0000B00400010002

 RBA X'0000B000'
 REP 0000002E 0000B00400010004
FABZ0001I OLD DATA WAS : 0000B00400010002

FABZ0013I ZAP FOR THE DATA SET ENDED WITH RC=00
IMS DB REPAIR FACILITY               (5655-E03)           "CONTROL STATEMENTS AND MESSAGES"                              PAGE:     1
VSAM ZAPPER                                                DATE: 07/31/2020  TIME: 13.22.21                         FABZVZAP - V3.R1

* DBNAME: PHIMDB1  PARTNAME: PHIMD1A  DSG:  B
* DS NAME: TESTDS.PUBLIC.SAMPLE.TPFOH1.B00001

 RBA X'00001800'
 REP 00000110 0000501800010004
FABZ0001I OLD DATA WAS : 0000181800010002

 REP 00000202 0000181800010004
FABZ0001I OLD DATA WAS : 0000181800010002

FABZ0013I ZAP FOR THE DATA SET ENDED WITH RC=00
```

Chapter 6. Troubleshooting

Use the following topics to diagnose and correct problems that you experience with IMS Database Repair Facility.

Topics:

- "IMS Database Repair Facility messages" on page 71
- "How to look up message explanations" on page 96
- "Gathering diagnostic information" on page 96
- "Generating a trace file" on page 97
- "Diagnostics Aid for IMS Database Repair Facility" on page 98

IMS Database Repair Facility messages

Use the information in these messages to help you diagnose and solve IMS Database Repair Facility problems. Messages are sent to the SYSPRINT data set, TSO user, or console operator using WTO and WTOR.

Message format

IMS Database Repair Facility messages adhere to the following format:

```
FABZnnnx
FABZnnnnx
```

where:

FABZ
Indicates that the message was issued by IMS Database Repair Facility

nnn
nnnn
Indicates the message identification number. It is either a three-digit number or a four-digit number.

There are similar message numbers in IMS Database Repair Facility. For example, there is both message FABZ001 and message FABZ0001. Following standard sequencing rules, messages FABZ0001I through FABZ0013I are listed before message FABZ000W.

x
Indicates the severity of the message:

E
Indicates that an error occurred, which might or might not require operator intervention.

I
Indicates that the message is informational only.

W
Indicates that the message is a warning to alert you to a possible error condition.

Each message also includes the following information:

Explanation:
The Explanation section explains what the message text means, why it occurred, and what its variables represent.

System action:
The System action section explains what the system will do in response to the event that triggered this message.

User response:

The User response section describes whether a response is necessary, what the appropriate response is, and how the response will affect the system or program.

FABZ0001I OLD DATA WAS *xxxxxx ...*

Explanation

The indicated old data (*xxxxxx ...*) was changed by the previous REP statement.

System action

None.

User response

None. This message is informational.

FABZ0002I VERIFIED DATA IS: *xxxx...xx*

Explanation

The indicated data (*xxxx...xx*) was verified by the previous VER statement, and was shown at the specified offset, whether the data is correct or not.

System action

If the data is *not* correct, a switch is set to reject all REP and DUMP statements until another KEY, RBA, NUM, or CNV is encountered.

User response

If the verifying operation was not successfully performed, correct the error and rerun the job.

FABZ0003W INVALID CARD OR NO-GO SWITCH (REASON CODE : *xx*)

Explanation

The statement entered was not successfully processed, since the statement was invalid or the internal NO-GO flag had been switched on because of a prior error. The value *xx* indicates the hexadecimal reason code of the error. The reason codes are as shown in the following tables.

Table 1. Control statement format error

Reason code	Meaning
11	The last non-blank character of the preceding line for the KEY statement was a comma, which means that a continued-key should follow, but the current line does not contain a valid continued-key.
12	The length of the key that is specified on the KEY control statement is more than 255 bytes.
13	The KEY statement ends with an invalid character sequence.
21	No essential hexadecimal value is specified for the operand of the RBA, NUM, or CNV control statement.
22	Non-numeric characters are found in the decimal expression for the operand of the RBA, NUM, or CNV control statement.
23	The decimal value that is specified as the operand of the RBA, NUM, or CNV control statement exceeds 4,294,967,295.
24	The decimal value that is specified as the operand of the RBA or CNV control statement exceeds 140,737,488,355,327, which is the maximum allowable value for extended addressable KSDS data sets and extended addressable LDS data sets.
25	The hexadecimal value that is specified as the operand of the RBA or CNV control statement exceeds X'7FFFFFFFFFFF', which is the maximum allowable value for extended addressable KSDS data sets and extended addressable LDS data sets.
26	The CNV control statement cannot be used when you access a compressed data set.
31	The hexadecimal expression for the 'offset' value of the VER or REP control statement has more than eight digits.
32	The offset value that is specified for the VER or REP control statement exceeds the record size of a VSAM data set.
33	The Replace function does not support using the relative byte address of the VSAM record on the RBA control statement when you access a compressed data set.

Table 1. Control statement format error (continued)

Reason code	Meaning
41	The hexadecimal expression for the operand of the VER or REP control statement does not have an even number of digits. This reason code can be returned for the RBA, NUM, CNV, or KEY control statement when the hexadecimal expression does not end with a single quotation mark.
42	An invalid character is found in a hexadecimal expression. This reason code can be returned for the RBA, NUM, CNV, or KEY control statement when the hexadecimal expression for the operand does not have an even number of digits.
43	A data length error is found in the hexadecimal expression. The operand of the RBA, NUM, or CNV control statement has more than the maximum allowable number of digits. The maximum number of digits is 16 for extended addressable KSDS data sets and extended addressable LDS data sets, and 8 for other data sets. Or, incomplete hexadecimal expression is found in the VER, REP, or KEY control statement.
51	The length of the 'password' operand of PSW control statement is more than eight.
52	An insufficient number of operands is specified for the control statement.
53	Data verification failed. Succeeding VER, REP, and DUMP statements are skipped until a new KEY, RBA, NUM, or CNV is located.

Table 2. Control statement sequence error

Reason code	Meaning
81	PSW statement is not specified as the first statement. PSW statement, if it is necessary, must be the first control statement.
82	CONSOLE statement, if it is specified, must be the only statement in the SYSIN data stream.
83	CHECK statement must be the first control statement.

Table 3. Skipped control statement

Reason code	Meaning
91	Because of a prior error in a control statement, the control statement is skipped. Or, it is skipped because the specified keyword is invalid.

System action

IMS Database Repair Facility skips all succeeding VER, REP, and DUMP control statements until a new KEY, RBA, NUM, or CNV is located.

User response

Correct the error and rerun the job.

FABZ0004E VSAM LOGICAL ERROR CODE : *xxx*

Explanation

A VSAM logical error occurred. The reason code of the logical error is *xxx*.

System action

IMS Database Repair Facility returns a reason code of the VSAM logical error.

User response

Refer to the MVS/DFP or MVS/DFSMS publication for an explanation of the reason codes (RPLERRCD) of VSAM logical errors to determine the cause of the logical error that is indicated by the reason code *xxx*.

FABZ0005E VSAM OPEN ERROR CODE : *xxx*

Explanation

An error occurred when VSAM attempted to open a catalog or data set. The reason code of the VSAM OPEN macro that is returned in the ERROR field of the VSAM ACB is *xxx*.

System action

IMS Database Repair Facility returns an OPEN reason code from VSAM.

User response

Refer to the MVS/DFP or MVS/DFSMS publication for an explanation of the error reason codes of VSAM OPEN macro to determine the cause of the problem indicated by the VSAM OPEN ERROR reason code *xxx*.

FABZ0006I ENTER FABZVZAP CONTROL STATEMENT OR END

Explanation

The next statement is to be entered from the system console.

System action

None.

User response

None. This message is informational.

FABZ0007I COMPLETED WITH HIGHEST RETURN CODE : *xx*

Explanation

The job completed with the display of the return codes (*xx*).

System action

None.

User response

None. This message is informational.

FABZ0008I DUMP COMPLETED

Explanation

IMS Database Repair Facility completed the dump.

System action

None.

User response

None. This message is informational.

FABZ0009E EXPECTED CONTINUATION NOT RECEIVED

Explanation

The last non-blank character of the previous KEY statement was a comma, which means that a continued-key should follow, but the current line contains a new KEY statement, or one of the RBA, NUM, or CNV statement. The message FABZ0003W (reason code = 11) follows this message.

System action

IMS Database Repair Facility skips all the succeeding VER, REP, and DUMP statements until a new KEY, RBA, NUM, or CNV statement is located.

User response

Correct the error and rerun the job.

FABZ0010I RUNNING IN CHECK MODE

Explanation

The zapper is running in check mode. No update will be done for the data set.

User response

None. This message is informational.

FABZ0011W VER/REP DATA CHECK WAS SUPPRESSED (REASON CODE: *XX*)

Explanation

The zapper is running in check mode but data check was not done due to the reason specified by the reason code as shown in the following table.

Table 4. Reason codes for FABZ0011W

Reason code	Meaning
01	The zapper cannot run data check because the preceding KEY, RBA, NUM, or CNV statement failed.
02	The record that was read by the previous statement was read again. In this case, the zapper cannot run data check for the records that were read by this statement.
03	CNV was used for reading records that were previously read by the KEY, RBA, or NUM statement. Or KEY, RBA, or NUM was used for the record that was previously read by CNV. In either case, the zapper cannot run data check for the records that were read by this statement.

System action

IMS Database Repair Facility continues processing and ends with a return code of 4 if no other statements produce return codes higher than 4.

User response

None.

FABZ0012I THE DUMP CONTROL STATEMENT HAS NO EFFECT IN THE CHECK MODE.

Explanation

The zapper is running in the check mode and the dump control statement is ignored in this mode.

User response

None. This message is informational.

FABZ0013I ZAP FOR THE DATA SET ENDED WITH RC=*rc*

Explanation

This message indicates the return code for each VSAM data set that is processed.

System action

Processing continues.

User response

If the return code is not zero, locate the preceding error messages in the Control Statements and Messages report in the SYSPRINT data set.

FABZ3586E OPEN FAILED FOR PRINT FILE

Explanation

After an OPEN macro was issued for a printer file, DCBOFLGS is not zero.

System action

IMS Database Repair Facility ends with abend code 3586.

User response

Run IMS Database Repair Facility with tracing enabled, recreate the problem, and send the entire run listing (including the dump, JCL, the trace, and all reports from IMS Database Repair Facility) to IBM Software Support.

FABZ3589E OPEN FAILED FOR CONTROL FILE

Explanation

After an OPEN macro was issued for a control statement file, DCBOFLGS is not zero.

System action

IMS Database Repair Facility ends with abend code 3589.

User response

Run IMS Database Repair Facility with tracing enabled, recreate the problem, and send the entire run listing (including the dump, JCL, the trace, and all reports from IMS Database Repair Facility) to IBM Software Support.

FABZ3663E ERROR IN CALCULATING ADDRESS OF POINTER

Explanation

An internal error occurred in calculating the actual direct access address of the record that contains the pointer.

System action

IMS Database Repair Facility ends with abend code 3663.

User response

Make sure that the database data set that IMS Database Repair Facility attempted to process is the correct data set. Then retry the operation. If the problem remains, run IMS Database Repair Facility with tracing enabled, recreate the problem, and send the entire run listing (including the dump, JCL, the trace, and all reports from IMS Database Repair Facility) to IBM Software Support.

FABZ000W SELECT A POINTER TYPE OR A NAVIGATE OPTION.

Explanation

You must select a pointer type or a navigate option to move around the database.

System action

IMS Database Repair Facility processing is halted until the missing information is provided.

User response

Select one of the pointers with a non-zero Tgt-RBA listed at the bottom of the panel.

FABZ001W *aaa* OF *xxx* POINTER CHAIN HAS BEEN REACHED.

Explanation

You reached the beginning or end of a PTF or PTB pointer chain.

System action

Processing is halted until the missing information is provided.

User response

Choose a different navigate option or select a pointer with a non-zero Tgt-RBA from the list at the bottom of the panel.

FABZ002W CONFLICTING SELECTION. SELECTED FIELDS WERE: *fields*

Explanation

Two or three conflicting fields were detected. You entered two or more of the following options: navigate option, pointer select, and pointer zap.

System action

IMS Database Repair Facility processing is halted until the conflicting information is removed.

User response

Select only one of the options. You might need to replace a default value with blanks if it is causing the problem.

FABZ003W INVALID DD NAME *xxxxxx* SPECIFIED IN LIST OF DB DATA SET NAMES.

Explanation

The data set or PDS member that you specified as a List of DB data set names contains a DD name that is not recognized.

System action

Processing is halted.

User response

Edit the data set or PDS member and correct or remove the DD name that is causing the problem. Then, rerun IMS Database Repair Facility.

FABZ004W CONFLICTING SELECTION. SELECT DYNLIB OR LIST OF DB DATA SET NAMES.

Explanation

You specified both a DYNLIB and a List of DB data set names.

System action

Processing is halted until the error is corrected.

User response

Remove either the DYNLIB name or the List of DB data set names.

FABZ005W MEMBER *xxxxxx* NOT FOUND IN *yyyyyy*

Explanation

The member *xxxxxx* was not found in data set *yyyyyy*.

System action

Processing is halted until the error is corrected.

User response

First, verify that you specified the member correctly. Then, make sure that you are referring to the correct library. If you are, determine whether the missing member is in that library. If it is not, contact your systems programmer or database administrator.

FABZ006I DATABASE SUCCESSFULLY UPDATED.

Explanation

The database was updated with the change you entered.

System action

Processing continues.

User response

None. This message is informational.

FABZ007W DATABASE ZAP FAILED.

Explanation

The database was not updated with the change you entered.

System action

Processing continues.

User response

None.

FABZ008W **VERIFY FAILED.**
OLD DATA : *xxxxxxxxxxxxxxxxxxxx*
VER DATA : *yyyyyyyyyyyyyyyyyyyy*

Explanation

An internal error occurred. The database is not updated with the change you entered.

System action

Processing is temporarily halted.

User response

Exit IMS Database Repair Facility and restart it. Then, try the modification again.

FABZ009E **ERROR OCCURRED DURING LISTCAT PROCESSING**

Explanation

An error occurred while processing the indicated function.

System action

Processing is halted.

User response

Restart IMS Database Repair Facility. If the problem persists, contact the systems programmer.

FABZ010W **NO IMS ID FOUND. OPTION 1 (SET UP IMS ENVIRONMENT) IS FORCED.**

Explanation

You must define an IMS ID before you can continue.

System action

IMS Database Repair Facility displays the **Setup-Specify libraries** panel.

User response

Enter an IMS ID on the displayed **Setup- Specify libraries** panel. Also, enter new library names or verify that the ones displayed are correct. Then, continue with option **2. View/Update database** by selecting the option in the IMS Database Repair Facility **Main menu**.

FABZ011W **INCORRECT VALUE *xx* WAS ENTERED ON LINE *yy*.**

Explanation

The value that was specified at offset *yy* is invalid.

System action

Processing continues.

User response

Enter a valid value.

FABZ012W **CONFLICTING UPDATES BETWEEN *xx* AND *yy* ON LINE *zz***

Explanation

You entered both character and hex values for the location pointed to by *zz*. But the values do not correspond.

System action

Processing is halted until the error is corrected.

User response

Correct the requested update. The character values are case-sensitive. To avoid conflicts, enter just the character or just the hex representation.

FABZ013W **OVERFLOW RBA *xxxx* POINTS TO THE FIRST RECORD, WHICH IS A SYSTEM RESERVED RECORD. ENTER AN RBA THAT WILL POINT TO THE SECOND, OR HIGHER, RECORD. RECORD LENGTH IS X'*BLKS*'.**

Explanation

The RBA may not point to the first record of a data set because it contains system control information.

System action

Processing is halted until the error is corrected.

User response

Enter an RBA that is greater or equal to the address of the second record.

FABZ014W **DATA SET *nnnnnn* NOT FOUND OR ALLOCATED TO ANOTHER USER.**

Explanation

The data set *nnnnnn* is not available.

System action

Processing cannot continue without this data set.

User response

Make sure that you correctly specified the data set name. Check to see that the data set exists. If it does, determine if it is allocated to someone else.

FABZ015W **INVALID DBD NAME OR DATA SET GROUP NUMBER (DG) SPECIFIED.**

Explanation

The specified database name or data set group number is not valid.

System action

Processing is halted until the error is corrected.

User response

Specify a valid data base name or data set group number.

FABZ016W **BLANKS WERE ENTERED ON LINE *xxxx*. IN ORDER TO BLANK OUT DATA YOU MUST ENTER 40 IN THE APPROPRIATE COLUMNS.**

Explanation

Blanks were entered in a hex representation of data.

System action

Processing is halted until the error is corrected.

User response

Replace the blanks with the character string 40, which is the hex representation for a blank.

FABZ017W **DATA WAS ENTERED IN NON-UPDATABLE BLANK AREA ON LINE *xxxx*.**

Explanation

An attempt was made to overlay a non-updatable area with data. The non-updatable area appears blank on the display.

System action

Processing is halted until the error is corrected.

User response

Remove the data from the non-updatable area by replacing it with blanks, and press Enter. Then, make further updates.

FABZ018W **RBA *xxxx* LESS THAN *yyyy* SIZE HEX *zzzz***

Explanation

The RBA specified was less than the block or control interval size. The data block always begins in the third block; the RBA pointed to an area before the data block.

System action

Processing is halted until the error is corrected.

User response

Specify an RBA greater than two times the block size or control interval size.

FABZ019W **NO INPUT PROVIDED IN DB LIST.**

Explanation

The list of DB data set names was empty.

System action

Processing cannot continue.

User response

Enter data into the list of DB data set names and retry.

FABZ020W **OVERFLOW RBA *xxxx* DOES NOT POINT TO THE BEGINNING OF A LOGICAL RECORD.**

Explanation

The RBA specified on this panel must point to the beginning of an overflow area.

System action

Processing is halted pending further action.

User response

Enter an RBA for the overflow area that is the beginning of a logical record and retry.

FABZ021W **VSAM DATA SET REQUIRES EVEN VALUE RBA.**

Explanation

An odd-valued RBA was entered. VSAM requires even-valued RBAs.

System action

The panel is not processed.

User response

Specify an even-valued RBA.

FABZ022W **NO UNDO OR HISTORY DATA FOUND.**

Explanation

Option **3. Undo changes**, option **4. View audit history of processed segments**, or option **5. Save changes in batch format** was selected, but the appropriate file was not available.

System action

Processing is halted pending further action.

User response

Choose option **2. View/Update database** to view or update the database before selecting the undo or history options again.

FABZ023W **NON-HEXADECIMAL CHARACTER FOUND IN SPECIFIED DATA ON LINE *xxxx***

Explanation

An attempt was made to enter non-hexadecimal data.

System action

Processing is halted pending further action.

User response

Enter hexadecimal data, that is, A-F, 0-9, and retry.

FABZ024W **LENGTH OF SPECIFIED ROOT KEY NOT EQUAL TO *xxxx*.**

Explanation

A root key was specified with an incorrect length.

System action

Processing is halted pending further action.

User response

Enter a root key whose length matches that specified in the error message.

FABZ025W **SPECIFIED RBA X'*xxxx*' IS INVALID.**

Explanation

The RBA contained non-hexadecimal characters.

System action

Processing is halted pending further action.

User response

Enter a value in hexadecimal format, that is, that contains only the characters A-F and 0-9.

FABZ026W **SPECIFIED FSE X'*xxxx*' AND/OR FSE LENGTH X'*yyyy*' IS INVALID.**

Explanation

The FSE or FSE length contained non-hexadecimal characters.

System action

Processing is halted pending further action.

User response

Enter a value in hexadecimal format, that is, that contains only the characters A-F and 0-9.

FABZ027W **SPECIFIED SEGMENT CODE X'*xxxx*' AND/OR DELETE BYTE X'*yyyy*' IS INVALID.**

Explanation

The segment code or delete byte contained non-hexadecimal characters.

System action

Processing is halted pending further action.

User response

Enter a segment code or delete byte in hexadecimal format, that is, that contains only the characters A-F and 0-9.

FABZ028E ***variable text***

Explanation

This message can have various texts. Most have to do with an incorrect RBA, block number, or root key.

System action

Processing is halted pending further action.

User response

If the message says *invalid key* or *key not found,* and you are certain of the key and syntax, exit IMS Database Repair Facility and PDF, and then try again. If the problem persists, run IMS Database Repair Facility with tracing enabled, recreate the problem, and send the trace to IBM support.

FABZ029W **IMS ID *xxxxx* TO BE COPIED IS NOT DEFINED IN REPAIR FACILITY**

Explanation

When creating a new IMS ID, an existing IMS ID was specified to be used as a template. This IMS ID could not be found.

System action

Processing is halted pending further action.

User response

Correct the error and continue.

FABZ030W **PRESS ENTER TO COMMIT THE CHANGES OR PRESS PF3 TO CANCEL.**

Explanation

If you wish the entered changes to be saved, press Enter. Pressing PF3 causes the changes to be lost.

System action

Processing is halted pending further action.

User response

Press Enter or PF3.

FABZ031W **REQUIRED FIELDS ARE INCORRECT OR MISSING. CORRECT DATA OR PRESS PF3 TO CANCEL.**

Explanation

Some fields contained missing or incorrect data. Correct the problem or press PF3 to cancel the operation.

System action

Processing is halted pending further action.

User response

Supply the correct data or press PF3 to cancel.

FABZ032W **NO RECON DYNAMIC ALLOCATION MEMBERS FOUND IN EITHER RESLIB OR DYNLIB.**

Explanation

Since no RECON dynamic allocation members were specified, IMS Database Repair Facility searched the RESLIB and DYNLIB for them. None were found.

System action

Processing is halted pending further action.

User response

Specify RECON dynamic allocation members or specify a RESLIB or DYNLIB that contains them. Press PF3 to cancel.

FABZ033I **KEY FOUND IN PARTITION # *pn* (DBD=*dbdname*).**

Explanation

A key was entered to access a segment. This informational message indicates the partition number and the partition DBD name that is associated with the key.

System action

Processing continues.

User response

Press Enter to continue.

FABZ034W **KEY FIELD STARTING AT OFFSET *xxxx* AND ENDING AT OFFSET *yyyy* CANNOT BE MODIFIED.**

Explanation

An attempt was made to alter data that was in a key field. Key fields may not be modified.

System action

Processing is halted.

User response

Modify only data that is not in the key field. The key field begins at *xxxx* and ends at *yyyy*.

FABZ035W **ALLOCATION FAILED FOR DATA SET *dsname*.**

Explanation

The specified data set does not exist or is in use by another user.

System action

Processing is halted.

User response

Verify that the data set name was correctly specified and check that it exists. If it does, it probably is in use by another user. Wait until the data set becomes available before continuing.

If allocation failed for *dsname=userid.prodid.dbdmap(xdbd)*, then the problem involves an IMS Database Repair Facility work file. Exit IMS Database Repair Facility and then restart it. By doing so, IMS Database Repair Facility allocates a new copy of this work file. If the problem persists, try using the CSVOL parameter when you start IMS Database Repair Facility.

FABZ036W **MULTIPLE REPAIR FACILITY SESSIONS ARE NOT SUPPORTED.**

Explanation

An attempt was made to start a second IMS Database Repair Facility session. A second session is not supported.

System action

Processing is halted.

User response

Wait until the other IMS Database Repair Facility session terminates, then invoke IMS Database Repair Facility.

FABZ037W **DATA SET NAME *dsname* (SPECIFIED IN *LIB*) NOT FOUND**

Explanation

The data set *dsname* was specified in *LIB*, but IMS Database Repair Facility was unable to find it.

System action

Processing is halted.

User response

Check that you specified the data set name correctly. If you did, make sure that it exists and is not in use by someone else.

FABZ038E **I/O ERROR ON *DSN***

Explanation

An I/O error occurred on data set *DSN*.

System action

Processing is halted.

User response

Exit IMS Database Repair Facility, invoke IMS Database Repair Facility, and try again. If problem persists, contact your system administrator.

FABZ039E **HALDB MASTER DBD *dbd* NOT DEFINED IN RECON.**

Explanation

RECON does not contain the master DBD.

System action

Processing is halted.

User response

Exit IMS Database Repair Facility and run the HALDB Partition Data Set Initialization utility, which is described in *IMS Database Utilities* for the IMS version that is installed at your site.

FABZ040E **RECON OPEN ERROR. RECON MIGHT BE UNAVAILABLE.**

Explanation

The RECON data set could not be opened because it is in use by another user or because of a VSAM error.

System action

Processing is halted.

User response

Exit IMS Database Repair Facility. When the data set is available, rerun IMS Database Repair Facility. If problem persists, contact your system administrator.

FABZ041E **HALDB PARTITION DATABASE *dbd* NOT DEFINED IN RECON.**

Explanation

RECON does not recognize database *dbd*.

System action

Processing is halted.

User response

Try rerunning IMS Database Repair Facility. If problem persists, contact your system administrator.

FABZ042W **SELECT A PARTITION OR PRESS PF3 TO EXIT.**

Explanation

Enter was pressed without selecting one of the partitions that are displayed on the panel.

System action

Processing is temporarily halted.

User response

Select a partition to continue, or press PF3 to exit.

FABZ043W **NO RECON DYNAMIC ALLOCATION MEMBERS FOUND IN DYNLIB SPECIFIED FOR RECONS.**

Explanation

The DYNLIB specified for RECONs did not contain the expected RECON dynamic allocation members.

System action

Processing is temporarily halted.

User response

Check the name of the DYNLIB specified or specify a different DYNLIB.

FABZ044W **DBD *xxx* NOT FOUND IN *yyyyyy***

Explanation

The DBD, *xxx*, was not found in the DBD library or the IMS directory data sets *yyyyyy*.

System action

Processing is temporarily halted.

User response

Check the name of the DBD specified, or specify the correct DBD library or the correct high-level qualifier of the IMS bootstrap data set for the IMS directory data sets.

FABZ045W **CURRENT POSITION IS BEGINNING OF CHAIN.**

Explanation

The user entered a pointer type incompatible with the current, beginning of chain, position. For instance, a backward navigation request may have been attempted.

System action

Processing is temporarily halted.

User response

Enter a different pointer type or navigation option.

FABZ046W **SEGMENT ACCESSED VIA INITIAL SELECTION. SEGMENT HAS NO PTB POINTER.**

Explanation

No further backward navigation is possible. During backward navigation, the end has been reached of a backward chain generated by IMS Database Repair Facility. Another possibility is that although the current segment is not the beginning of a PTF chain, there are no PTB pointers to continue further backward navigation.

System action

Processing is temporarily halted.

User response

Enter a different pointer type or navigation option.

FABZ047W **END OF SYNONYM (PTF) POINTER CHAIN HAS BEEN REACHED.**

Explanation

You reached the end of a synonym or pointer chain in an HDAM database.

System action

Processing is halted until the missing information is provided.

User response

Choose a different navigate option or select a pointer with a non-zero Tgt-RBA from the list at the bottom of the panel.

FABZ048E RANDOMIZING LOAD MODULE *xxx* NOT FOUND IN RANDLIB OR RESLIB.

Explanation

IMS Database Repair Facility was unable to locate the randomizing load module *xxx* in RANDLIB or RESLIB.

System action

Processing is temporarily halted.

User response

Check your spelling or specify a different RANDLIB.

FABZ049I SETUP SUCCESSFUL.

Explanation

The IMS environment is set up successfully.

System action

Processing continues.

User response

None. This message is informational.

FABZ050E MODULE DFSVC000 NOT FOUND IN DATASET SPECIFIED FOR RESLIB. THE DATASET MIGHT NOT BE AN IMS RESLIB

Explanation

The DFSVC000 module does not exist in the data set that the IMS RESLIB field specifies.

System action

Processing is halted until the error is corrected.

User response

Specify the correct IMS RESLIB data set name in the IMS RESLIB field.

FABZ051I ZAP SUCCEEDED ON ALL ADS.

Explanation

The area data set (ADS) you are viewing, as well as all other 'available' ADS for this DEDB area, were successfully updated with the change you made on this panel.

System action

Processing continues.

User response

None. This message is informational.

FABZ051W ZAP SUCCEEDED ON ALL ADS. THIS AREA HAD EEQE'S.

Explanation

The area data set (ADS) you are viewing, as well as any other 'available' ADS for this DEDB area, was successfully updated with the change you made on this panel. This area does contain error queue elements (EEQEs), and any zap you have done might be overwritten if IMS resolves these EEQEs.

System action

Processing continues.

User response

None.

FABZ052E ZAP FAILED FOR ALL ADS.

Explanation

The area data set (ADS) you are viewing, and all other 'available' ADS for this DEDB area, were not updated with the change you made on this panel.

System action

Processing continues.

User response

Contact your IMS database administrator, who might want to examine the status and data in the multiple area data sets (MADS) for this area.

FABZ053E ZAP FAILED FOR THESE ADS: *xx*

Explanation

xx is a list of area data sets (ADS) that were not successfully updated with the change you made on the panel. Any ADS that is not in this list was successfully updated.

System action

Processing continues.

User response

Contact your IMS database administrator, who might want to examine the status and data in the multiple area data sets (MADS) for this area.

FABZ054W LIST OF DB DATA SETS IS INCORRECT

Explanation

Because the DBD is a HIDAM DBD, the list of database data sets must contain at least two lines: one for the index data set and one for the data. The data set or member that you specified as 'List of DB data sets' has only one line.

System action

Processing is interrupted until the problem is corrected.

User response

Correct the error by entering the name of another DBD data set list.

FABZ055W NO AVAILABLE DATASETS FOR AREA CHOSEN, TRY ANOTHER

Explanation

When IMS Database Repair Facility is used for a DEDB database interactively, IMS Database Repair Facility checks with the RECON data sets whether the data sets for the specified area are in available status. This message indicates that the area data sets are not in available status in the RECON data sets.

System action

Processing is halted.

User response

See the description about DEDB database usage in "Viewing and updating an HD or DEDB database" on page 16, then, follow these steps:

- Examine the RECON data sets and ensure that the area data sets are in available status. If the area data sets are in unavailable status, issue CHANGE.ADS commands to change the status of the area data sets.
- If you specified the dynamic allocation library to supply the names of the area data sets (Update libraries panel), ensure that the dynamic allocation library contains the correct dynamic allocation members for the database area.
- If you specified the List of DB data set names field (Update libraries panel), ensure that the correct database area names and area data set names are included in the list.

FABZ056W No available datasets for this DBD

Explanation

When IMS Database Repair Facility is used for a DEDB database interactively, IMS Database Repair Facility checks with the RECON data sets whether the area data sets of the database are in available status. This message indicates that none of the area data sets of the database are in available status in the RECON data sets.

System action

Processing is halted.

User response

See the description about DEDB database usage in "Viewing and updating an HD or DEDB database" on page 16, then, follow these steps:

- Examine the RECON data sets and ensure that the area data sets of the database are in available status. If the area data sets are in unavailable status, issue CHANGE.ADS commands to change the status of the area data sets.
- If you specified the dynamic allocation library to supply the names of the area data sets (**Update libraries** panel), ensure that the dynamic allocation library contains the correct dynamic allocation members for the database areas.

FABZ057W DSG MUST BE 01 FOR HDAM AND RAPS=Y

Explanation

For HIDAM databases, RAPs exist only in DSG=01.

System action

Processing is interrupted until the problem is corrected.

User response

Correct the error by setting the data set group to 01.

FABZ058W RBA ONLY VALID FOR HISAM AND DG=OV

Explanation

You can enter only an RBA value on this panel if the database organization is HISAM and DG is OV (overflow). The RBA is used to specify the value of an address of a database segment. If this screen shows a HIDAM index or a secondary index, or HISAM index with DG=01, then an entry for RBA is meaningless.

System action

Processing is interrupted until the problem is corrected.

User response

Correct the error by removing the RBA value and entering a key instead.

FABZ059W PDB DETECTED

Explanation

A PDB database was detected, but PDB databases are not supported by IMS Database Repair Facility.

System action

Processing is temporarily halted.

User response

Use a different database.

FABZ061I PARTITION DBD NAME IS NOT VALID.

Explanation

An invalid partition DBD name is specified on the **Initial selection** panel for a PHIDAM, PHDAM, or partition secondary index database.

System action

Processing is temporarily halted.

User response

Specify a valid partition DBD name.

FABZ062I MAKE A SELECTION, OR PF3 TO EXIT.

Explanation

The panel presents a list of items, from which you can select one. None were selected.

System action

The panel is not processed.

User response

You must select one item from the list on the panel.

FABZ063W SELECTED DATA SET GROUP (DSG) *dsg* DOES NOT EXIST. DSGS FOUND FOR PARTITION *dbd* WERE *dsg-list*.

Explanation

You specified a data set group name that does not exist in the partition.

System action

Processing is halted until you enter another data set group name.

User response

Specify one of the data set groups from the data set group list.

FABZ064W ENTER A VALID RBA, *block/ control interval* OR ROOT KEY TO PROCEED.

Explanation

An invalid RBA was specified.

System action

Processing is halted until you specify a different RBA.

User response

Enter a valid RBA.

FABZ065W THIS PANEL DISPLAYS "RAW" BLOCK DATA ONLY. KEYS, DATA AND POINTERS ARE NOT PROTECTED FROM ANY UPDATES.

Explanation

Either the block data or CI data is displayed in the panel. Data and pointers that are displayed in the panel are not protected from updates you make through this panel. Work on this panel with caution.

System action

Processing continues.

User response

None.

FABZ066I DATA UPDATE CANCELLED BY USER.

Explanation

You canceled the updating of data.

System action

Processing continues.

User response

None. This message is informational.

FABZ067W NON-HEXADECIMAL VALUE ENTERED AT OFFSET *offset*. CHANGES NOT ACCEPTED. ERROR WAS IN THE FOLLOWING STRING: *error-string*.

Explanation

You attempted to enter non-hexadecimal data at offset *offset*. Only hexadecimal data can be entered at this point.

System action

Processing stops.

User response

Enter a hexadecimal value to continue.

FABZ068I RBA AND KEY ARE AN INVALID COMBINATION. IF RBA POPULATED BY A PREVIOUS KEY SELECTION, THEN USE RBA FOR FASTER PROCESSING.

Explanation

You attempted to enter both an RBA and a key, but this combination is not supported.

System action

Processing stops.

User response

Remove either your RBA entry or your key entry, so that processing can continue.

FABZ071I *xxx* OPTION REQUIRES *yyy* PTR TO EXIST.

Explanation

You specified an invalid combination of option and pointer. Valid *xxx,yyy* pairs are:

- F,PTF
- B,PTB
- U,PP

You cannot perform the *xxx* option if the *yyy* pointer is not displayed on the panel.

System action

Processing is temporarily halted.

User response

Use a valid option-pointer combination.

FABZ072I *variable_text*

Explanation

An internal error occurred.

System action

Processing is halted.

User response

Exit IMS Database Repair Facility and then restart it. If the problem persists, run IMS Database Repair Facility with tracing enabled, recreate the problem, and send the trace to IBM support.

FABZ073I FSE OPTION NOT VALID, BLOCK HAS NO FREE SPACE OR NO IMS DATA

Explanation

The option that you specified for FSE is not valid for IMS bit map blocks or control intervals. It is also not valid for unused control intervals.

System action

Processing is temporarily halted.

User response

Set FSE=*n* for this block or control interval.

FABZ074I RAPS OPTION NOT VALID FOR IMS BIT MAP BLOCKS/CIS OR UNUSED CIS

Explanation

The RAPS option that you specified is not valid for IMS bit map blocks or control intervals. It is also not valid for unused control intervals.

System action

Processing is temporarily halted.

User response

Set RAPS=*n* for this block or control interval.

FABZ075I ONLY ONE PARTITION SELECTABLE AT A TIME. MULTIPLE PARTITION SELECTION NOT SUPPORTED.

Explanation

You selected more than one partition. Multiple partition selection is not supported.

System action

Processing is temporarily halted.

User response

Select only one partition.

FABZ076E CONTROL INTERVAL/BLOCK MULTIPLIED BY BLOCKSIZE YIELDS AN RBA EXCEEDING 31 BIT ADDRESSABILITY FOR VSAM OR 32 BIT ADDRESSABILITY FOR OSAM

Explanation

On this panel, you entered a Block/CI number. IMS Database Repair Facility multiplies this value by the block size for this data set to yield an RBA for this block. This RBA exceeds the limit for either OSAM or VSAM data sets.

System action

The panel is not processed.

User response

You must enter a smaller block/CI number. When you enter a value for block/CI number, you must have an idea as to how many blocks are in this data set.

FABZ077I FAILURE IN *module-name*, RC=*module-return-code*

Explanation

IMS Database Repair Facility was unable to process the requested DBD. A probable cause could be a failure to allocate work files.

System action

Processing continues.

User response

Exit IMS Database Repair Facility, restart and try this DBD again. If the problem persists, try using the CSVOL parameter when you start IMS Database Repair Facility.

FABZ078W NON-HEXADECIMAL VALUE ENTERED IN KEY

Explanation

You attempted to enter a non-hexadecimal value in the key field, which is not supported.

System action

Processing stops.

User response

Enter a hexadecimal value in the key field for processing to continue.

FABZ080E HEX DATA WAS BLANKED OUT, ENTERED IN AN INVALID AREA OR NON HEX DATA ENTERED.

(*location*).ATTEMPTED UPDATE= *string-in-error*

Explanation

Your attempt at entering data was unsuccessful. Possible causes are that you tried to enter hexadecimal data in a valid area, or non-hexadecimal data into an area requiring hex data. Or you might have blanked out your data before entering it.

System action

Processing stops.

User response

Modify the data or location where it is to go. Make sure that the type of data and the field correspond.

FABZ081E **CHARACTER DATA ENTERED OVER NON-DISPLAYABLE CHARACTERS OR ON AN INVALID BOUNDARY. IF NON-DISPLAYABLE CHARACTERS, OR TRAILING VALID BLANKS NEED TO BE UPDATED, RETURN TO HEX DATA DISPLAY TO DO IT. (*error-location*) ATTEMPTED UPDATE= *error-string*.**

Explanation

Your attempt at entering data was unsuccessful for one of the reasons specified. Your data entry is discarded.

System action

Processing stops.

User response

Reenter the data at a valid location or switch to hex data display mode for entry.

FABZ082W **HEXADECIMAL STRING LENGTH ENTERED HAS AN UNEVEN LENGTH.**

Explanation

You attempted to enter a hexadecimal string with an odd number of bytes. Hexadecimal data must be entered in pairs.

System action

Processing stops.

User response

Enter a hexadecimal string with an even number of bytes.

FABZ083S **SEVERE ERROR, DATABASE REPAIR FACILITY. EXIT ISPF, LOGOFF TSO AND LOGIN AGAIN BEFORE PROCEEDING. IF PROBLEM PERSISTS THEN CONTACT IBM FOR SUPPORT.**

Explanation

A severe error occurred and IMS Database Repair Facility terminated.

System action

Processing stops.

User response

To see if you can recreate this error, exit ISPF, log off of TSO, then log back on TSO before proceeding. If the problem persists, gather the diagnostic information by following the steps in "Gathering diagnostic information" on page 96 and contact IBM Software Support.

FABZ084E **OVERFLOW RBA *overflow-RBA* POINTS TO THE FIRST RECORD, WHICH IS A SYSTEM RESERVED RECORD. CANNOT FOLLOW THE OVERFLOW RBA TO THIS RECORD.**

Explanation

The overflow RBA contains an invalid pointer that points to a system reserved record.

System action

Processing stops.

User response

Choose another action to perform.

FABZ085W **BLOCKS BEYOND ROOT-ADDRESSABLE AREA (&DRBN) DO NOT CONTAIN RAPs.**

Explanation

The block number that was entered is for a block that is beyond the root-addressable area, and thus, has no RAPs.

System action

None.

User response

Set RAPS=*N*.

FABZ086W SELECTED DATA SET GROUP (DSG) *value1* DOES NOT EXIST. THE NUMBER OF DATA SET GROUPS FOR THIS DBD IS *value2*

Explanation

The specified data set group number or the area number (*value1*) does not exist. *value2* shows the total number of data set groups or areas in this database.

System action

Processing is interrupted until the problem is corrected.

User response

Specify the correct number of the data set group or the correct area number.

FABZ087W SELECTED POINTER IS INVALID (ODD-VALUE) FOR VSAM.

Explanation

The selected pointer is an odd-valued RBA, which is an invalid pointer in this VSAM data set.

System action

Job terminates.

User response

Cannot select this pointer.

FABZ088W THIS BLOCK HAS NO FREE SPACE OR NO IMS DATA.

Explanation

The block that is specified does not have an FSEAP and does not contain current IMS data.

System action

Job terminates.

User response

Specify a different block.

FABZ091I OLR ACTIVE OR PARTITION UNAVAILABLE, ACCESS IS DENIED. *partition_status*

Explanation

The HALDB partition cannot be processed because one of the following conditions is true:

- The HALDB online reorganization (OLR) cursor is active.

  The OLR cursor is active when HALDB online reorganization is in progress or HALDB online reorganization was suspended.
- The DB Reorg Intent flag is on in the HALDB partition.

  The HALDB partition is being reorganized.
- The HALDB partition is unavailable.

  A HALDB partition is in unavailable status when the partition is disabled or requires initialization.

System action

Processing is halted.

User response

If the OLR cursor is active or the DB Reorg Intent flag is on, complete the HALDB partition reorganization and perform the IMS Database Repair Facility operation for this HALDB partition.

FABZ092I INVALID DATASET, CONTAINS NON-DBRF DATA.

Explanation

The first four lines in the file that the List of DB data set names field specifies are not in the required format.

System action

Processing is halted until the error is corrected.

User response

See the TSO edit panel (Figure 8 on page 16) in “Viewing and updating the database” on page 14 for the format for the file and correct the list.

FABZ095I CANNOT SPECIFY DBD & KEY WHEN PSE NAME IS NOT **NULL**

Explanation

The specified database uses a partition selection exit routine. When a partition selection exit routine is used, you cannot specify the partition DBD name.

System action

Processing is halted until the error is corrected.

User response

When a database uses a partition selection exit routine, specify only a root key and do not specify the name of the database partition in the Partition DBD name field.

FABZ097I **BATCH INPUT CREATED IN *data_set***

Explanation

The data set is created. The data set contains the current changes that you made through the interactive operations.

System action

Processing continues.

User response

None. This message is informational.

FABZ100W **DATA SET NAME *dsname* EXCEEDS 44 BYTES. USE SHORTER WORK DATA SET QUALIFIER.**

Explanation

The length of the work data set name exceeds 44 bytes and system cannot allocate the data set.

System action

Processing is halted.

User response

High-level qualifier for work data sets specified when you start IMS Database Repair Facility is too long. Use shorter work data sets qualifier.

FABZ101W **AREA *area* IS NOT DEFINED IN RECON**

Explanation

The indicated area is not found in the RECON data sets.

System action

Processing is interrupted until the problem is corrected.

User response

Specify the correct RECON data sets.

FABZ102W **Specify an even value for the RBA because this HALDB is registered in RECON as DSORG=OSAM and the active DBDS is an A-side data set.**

Explanation

This database is registered in RECON as DSORG=OSAM, which means that the maximum data set capacity is 4 GB. Also, the current active database data sets of this HALDB are A-side data sets. For a HALDB in such a state, an even value must be specified for the RBA.

System action

Processing is halted until the error is corrected.

User response

Specify an even value for the RBA.

FABZ103W **The selected pointer must have an even value for the RBA because this HALDB is registered in RECON as DSORG=OSAM and the active DBDS is an A-side data set. Correct the RBA so it contains an even value.**

Explanation

This database is registered in RECON as DSORG=OSAM, which means that the maximum data set capacity is 4 GB. Also, the current active database data sets of this HALDB are A-side data sets. For a HALDB in such a state, an even value must be specified for the pointer.

System action

Processing is halted until the error is corrected.

User response

Correct the RBA so it contains an even value.

FABZ104W **The specified RBA points to a location beyond the maximum size**

of this DBDS. Because this DBDS is *variable_text*, the maximum size is *n* GB. Specify a valid RBA within the DBDS.

Explanation

The specified RBA points to a location beyond the maximum size of this database data set. You must specify an RBA within the database data set. The maximum size of a database data set is as follows:

- 4 GB for a VSAM data set
- 4 GB for a non-HALDB OSAM data set with odd block size
- 8 GB for a non-HALDB OSAM data set with even block size
- 4 GB for an OSAM data set of HALDB that is registered as DSORG=OSAM in RECON
- 8 GB for an OSAM data set of HALDB that is registered as DSORG=OSAM8G in RECON

System action

Processing is halted until the error is corrected.

User response

Specify a valid RBA within the database data set.

FABZ105E **This HALDB is registered in RECON as DSORG=OSAM8G. But the active DBDS is an M-side data set.**

Explanation

This database is registered in RECON as DSORG=OSAM8G, which means that the maximum data set capacity is 8 GB and the A-side data sets must be active. However, the current active database data sets are M-side data sets. The information in the RECON data sets does not match the database state.

System action

Processing is halted until the error is corrected.

User response

Specify the correct RECON data sets.

FABZ106E **ERROR RETURNED FROM IMS TOOLS CATALOG INTERFACE *text***

Explanation

IMS Database Repair Facility received an error return code from IMS Tools Catalog Interface. *text* provides one of the following additional information:

- FUNC=OPEN RC=*return_code* RSN=*reason_code*
- FUNC=CLOSE RC=*return_code* RSN=*reason_code*
- FUNC=LIST DBD=*dbdname* RC=*return_code* RSN=*reason_code*
- FUNC=GET DBD=*dbdname* RC=*return_code* RSN=*reason_code*

The return code and reason code from IMS Tools Catalog Interface are shown in *return_code* and *reason_code*, respectively.

System action

Processing is halted.

User response

See IMS Tools Catalog Interface messages (GEX3*xxxx*) to determine the cause of the error and correct the error.

The following list provides possible causes and recommended actions:

- If the function is OPEN, ensure that the correct SGLXLOAD library of IMS Tools Base is specified and the correct high-level qualifier of the IMS bootstrap data set is specified on the **Setup- Specify libraries** or the **Update libraries** panel.
- If the function is FUNC=GET or LIST, insufficient region size might cause this problem. Increase the REGION=*size* in the JCL.
- If the function is CLOSE or if the problem persists, contact IBM Software Support.

FABZ107E **ERROR RETURNED FROM IMS DFSGVRM API FUNC=*function* RC=*rc* RSN=*rsn***

Explanation

IMS Database Repair Facility called the IMS DFSGVRM API to obtain the version, release, and modification level of the IMS system, but it received an error return code from the IMS DFSGVRM API. *function* is the function name of the IMS DFSGVRM API, *rc* is the return code in hexadecimal, and *rsn* is the reason code in hexadecimal.

System action

Processing is halted.

User response

See *IMS System Programming APIs* and check the return code and the reason code from the DFSGVRM API. Correct the problem or press PF3 to cancel. If the problem persists, run IMS Database Repair Facility with tracing enabled, recreate the problem, and send the trace to IBM Software Support.

FABZ800I DBRF ENDED NORMALLY

Explanation

The ILK Repair utility ended successfully.

System action

The ILK Repair utility ends with a return code of 0.

User response

None. This message is informational.

FABZ801E *ddname* DD WAS NOT FOUND

Explanation

The indicated DD statement must be supplied but was not found in the JCL stream.

System action

The ILK Repair utility ends with a return code of 20.

User response

See "Running the ILK Repair utility" on page 67 and add the required DD statement. Rerun the job.

FABZ802E SPECIFIED FABZIN DATA SET IS INVALID

Explanation

An incorrect data set is specified on the FABZIN DD statement. The FABPILK data set that was created by the HD Pointer Checker utility must be specified on the FABZIN DD statement.

System action

The ILK Repair utility ends with a return code of 20.

User response

Specify the correct data set to the FABZIN DD statement and then rerun the job.

FABZ803E ZAP FAILED FOR [OSAM | VSAM] DATA SET RC=*rc*

Explanation

The ILK Repair utility failed to update an OSAM or VSAM data set.

System action

The ILK Repair utility ends with the indicated return code.

User response

Locate the messages that explain the error in the Control Statements and Messages report. The report is generated in the SYSTSPRT data set for OSAM data sets, and in the SYSPRINT data set for VSAM data sets.

FABZ804E DBRF ENDED WITH ERRORS

Explanation

The ILK Repair utility encountered errors.

System action

The ILK Repair utility ends with a return code of 20.

User response

Locate the messages that explain the error in the Control Statements and Messages reports. Correct the errors and then rerun the job.

FABZ805E [ALLOCATION | UNALLOCATION] FAILED FOR *ddname* DD, DATA SET DSNAME=*data_set_name*

Explanation

The ILK Repair utility failed to allocate the indicated data set to the indicated DD statement, or failed to unallocate the indicated data set from the indicated DD statement.

System action

The ILK Repair utility ends with a return code of 20.

User response

For an allocation failure of the database data set, ensure that the data set is cataloged and is not used by other jobs or users. For an unallocation failure, release the data set from the DD statement.

FABZ806E MEMBER *member_name* NOT FOUND IN DATA SET DSNAME=*data_set_name*

Explanation

The indicated member is not found in the indicated data set. The indicated data set is either *smphlq*.SFABLMD0 or *smphlq*.SFABCLIB, where *smphlq* is the parameter that you specified on the SYSTSIN DD statement.

System action

The ILK Repair utility ends with a return code of 20.

User response

Specify the correct *smphlq* parameter in the SYSTSIN DD statement and then rerun the job.

FABZ807E DELETE FAILED FOR DATA SET DSNAME=*data_set_name*

Explanation

The ILK Repair utility could not delete the indicated data set.

System action

The ILK Repair utility ends with a return code of 20.

User response

Delete the data set and then rerun the job.

FABZ808I ZAP FOR THE DATA SET ENDED WITH RC=*rc*

Explanation

This message indicates the return code for each OSAM data set that is processed.

System action

Processing continues.

User response

If the return code is not zero, locate the preceding error messages in the Control Statements and Messages report in the SYSTSPRT data set.

FABZ901I VER WORKED.

Explanation

The verify action, as requested by the VER input record, worked.

System action

None.

User response

None. This message is informational.

FABZ902I REP WORKED.

Explanation

The replace action, as requested by the REP input record, worked.

System action

None.

User response

None. This message is informational.

FABZ908E CARD NOT VALID WITHOUT PRECEDING ORBA/OBLK CARD.

Explanation

The current input record card is not valid because there was no preceding ORBA/OBLK card processed.

System action

Batch Repair for OSAM terminates with return code 20.

User response

Insert a ORBA/OBLK card prior to the card that caused the failure.

FABZ909E ALLOC FAILED FOR WORK DATA SET [*data set name*]

Explanation

Allocation of a work data set failed.

System action

Batch Repair for OSAM terminates with return code 20.

User response

The work data set uses the UHLQ parameter as its first qualifier, this message might indicate that the UHLQ is not valid.

FABZ910E MISSING REQUIRED PARAMETERS. SMPHLQ,UHLQ,PID

Explanation

SMPHLQ, UHLQ, and PID parameters are required in the SYSTSIN data set in JCL.

System action

Batch Repair for OSAM terminates with return code 20.

User response

Specify these required parameters. For more information about these parameters, see "Modifying an OSAM data set" on page 60.

FABZ911E DATASET NOT FOUND, *text1 text2*

Explanation

A data set was not found, *text1* is the data set name.

System action

Batch Repair for OSAM terminates with return code 20.

User response

text2 might contain some diagnostic information, for example, if the data set name includes an execution parameter, such as SMPHLQ, it is indicated in *text2*. Check and correct the parameter. If *text2* contains no diagnostic information, rerun the job by setting the *debug* parameter to 1 in the SYSTSIN data set of the JCL. Then, send the entire job output to IBM.

FABZ912E SYSLIB DD MISSING

Explanation

The SYSLIB DD is required, it is the OSAM data set to be repaired.

System action

Batch Repair for OSAM terminates with return code 20.

User response

Add the SYSLIB DD.

FABZ913E SYSLIB DD IS NOT OSAM

Explanation

The SYSLIB DD must be an OSAM data set.

System action

Batch Repair for OSAM terminates with return code 20.

User response

Change the SYSLIB DD to an OSAM data set.

FABZ914E INVALID SYSIN CARD, REASON=*reason-code meaning*

Explanation

See the following reason codes and definitions:

Table 5. Reason codes for FABZ914E

Reason code	Meaning
11	OBLK block number must be decimal value.
12	OBLK block number is missing.
21	ORBA record-RBA has invalid HEX format.
22	ORBA record-RBA must be hex or decimal format.
23	ORBA record-RBA is missing.
31	VER/REP missing offset or data.
32	VER/REP offset must be hex.
33	VER/REP offset must be less than blksize=*blksz*.
34	Data value must be even number of characters.
35	Data length plus offset exceeds blksize=*blksz*.
41	Unrecognized statement.
42	Check must be the first statement.

System action

Batch Repair for OSAM terminates with return code 20.

User response

Correct the card according to the rules for SYSIN functions.

FABZ930E INTERNAL ERROR IN *text1* rc=*rc*

Explanation

An internal error occurred.

System action

Batch Repair for OSAM terminates with return code 20.

User response

If this is not the case, set the *debug* parameter to 1 and rerun the job. Then, send the entire job output to IBM.

FABZ931E ORBA IS NOT A BLOCK ADDRESS. BLOCK ADDRESS = *text1*

Explanation

On the ORBA card, the record-RBA must be the address of a block, not and RBA within the block.

System action

Batch Repair for OSAM terminates with return code 20.

User response

Change the record-RBA value on ORBA card. text1 is the nearest valid value.

FABZ932E TABLE SERVICE CALL FAILED. *text1*

Explanation

An internal error occurred. *text1* is the table service function

System action

Batch Repair for OSAM terminates with return code 20.

User response

If this is not the case, set the *debug* parameter to 1 and rerun the job. Then, send the entire job output to IBM.

FABZ933E FAILED TO CONVERT RBA INTO OSAM CONTROL DATA. *txt933*

Explanation

The RBA specified on ORBA or the RBA corresponding to the block-number on OBLK was not successfully converted to OSAM control data for this data set. *txt933* might reveal a reason, the most likely is *RBA beyond extents*.

System action

Batch Repair for OSAM terminates with return code 20.

User response

Ensure the RBA block-number is for a block that is within the current extents of the data set. If the error persists or *txt933* does not reveal another easy correction to try, set the *debug* parameter to 1 and rerun the job. Then, send the entire job output to IBM.

FABZ940E VER FAILED.

Explanation

The verify function failed, the data in the data set did not match the value at the offset specified on the VER card.

System action

Batch Repair for OSAM terminates with return code 20.

User response

Ensure that the offset and data values on the VER card are correct, use DUMP to see what the current block looks like.

FABZ950I RUNNING IN CHECK MODE

Explanation

The zapper is running in check mode. No update will be done for the data set.

User response

None. This message is informational.

FABZ951W VER/REP DATA CHECK WAS SUPPRESSED (REASON CODE: *XX*)

Explanation

The zapper is running in check mode but data check was not done due to the reason identified by the reason code as shown in the following table.

Table 6. Reason codes for FABZ951W

Reason code	Meaning
01	The zapper cannot run data check because the preceding ORBA or OBLK statement failed.
02	The block that was read by the previous statement was read again. In this case, the zapper cannot run data check for the blocks that are read by this statement.

System action

Batch Repair for OSAM continues processing and ends with a return code of 4 if no other statements produce return codes higher than 4.

User response

None.

FABZ952I VERIFIED DATA IS: *data*

Explanation

The indicated data *data* was verified by the previous VER statement, and was shown at the specified offset, whether the data is correct or not.

User response

If the verifying operation was not successfully done, correct the error and rerun the job.

FABZ953I OLD DATA WAS: *data*

Explanation

The indicated old data *data* was changed by the previous REP statement.

User response

None. This message is informational.

FABZ954I THE DUMP CONTROL STATEMENT HAS NO EFFECT IN THE CHECK MODE.

Explanation

The zapper is running in the check mode and the dump control statement is ignored in this mode.

User response

None. This message is informational.

How to look up message explanations

You can use several methods to search for messages and codes.

Searching for messages on the web

You can use any of the popular search engines that are available on the web to search for message explanations. When you type the specific message number or code into the search engine, you are presented with links to the message information in the IBM Documentation.

Gathering diagnostic information

Before you report a problem with IMS Database Repair Facility to IBM Software Support, you must gather appropriate diagnostic information.

Procedure

If IMS Database Repair Facility either fails or produces incorrect results, collect the following items for further analysis.

- Screen captures. For each screen, provide a screen capture. By taking a screen capture of each screen, you are providing a step-by-step history of your actions.

  The timing of the screen capture is important. Type in your data, but before you press Enter, take the screen capture using Cut and Paste.
- Trace file. Rerun your procedure after invoking the tracing CLIST to obtain a trace file. For more information, see "Generating a trace file" on page 97.

- A Load Module APAR Status report and a Clist APAR Status report. You can generate these reports by running the Diagnostics Aid. For more information, see "Diagnostics Aid for IMS Database Repair Facility" on page 98.

Send the diagnostic information to IBM, along with a description of the problem or failure symptoms.

Generating a trace file

Running the trace EXEC creates a trace file that you can submit as part of your problem documentation. Complete the following steps to generate a trace.

Procedure

1. Start the trace EXEC by entering the following statement:

   ```
   EX 'smphlq.SFABCLIB(FABZTRAP)' 'smphlq workhlq csvol fdebug'
   ```

   Where:

   smphlq
   Is the high-level qualifier of the SMP/E target data sets.

   workhlq
   Is an optional high-level qualifier for work data sets.

   csvol
   Is an optional parameter that specifies the volume serial of a DASD device to be used by IMS Database Repair Facility data sets (for non-SMS sites only).

   fdebug
   Is an optional parameter. Set it to 1 to enable tracing. The default is to have tracing disabled.

   The *workhlq*, *csvol*, and *fdebug* parameters are optional. When one of these parameters is omitted, but subsequent ones appear, an asterisk is used as a placeholder. See "Examples" on page 97 for what happens when these parameters are specified or omitted.

2. Duplicate the steps that caused IMS Database Repair Facility to fail or to produce incorrect results.

   After you run IMS Database Repair Facility in tracing mode, a trace file is produced with the following naming convention:

   ```
   userid.DBRTRAP.Dnnnnn.Tnnnnn
   ```

   Dnnnnn and *Tnnnnn* are today's date and time.

Examples

The following examples illustrate what happens when these parameters are specified or omitted.

- All three, *workhlq*, *csvol*, and *fdebug* are specified:

  ```
  EX 'smphlq.SFABCLIB(FABZTRAP)' 'smphlq ZZZ SYS666 1'
  ```

  The work data set names default to ZZZ.*userid.xxx*, the data set allocation uses UNIT=SYS666, and tracing takes place.

- Only *csvol* and *fdebug* are specified:

  ```
  EX 'smphlq.SFABCLIB(FABZTRAP)' 'smphlq * SYS123 1'
  ```

  The work data set names default to *userid.xxx*, the data set allocation uses UNIT=SYS123, and tracing takes place.

- *workhlq* and *csvol* are not specified, but *fdebug* is specified:

  ```
  EX 'smphlq.SFABCLIB(FABZTRAP)' 'smphlq * * 1'
  ```

The work data set names default to *userid.xxx*, and the data set allocation uses UNIT=SYSDA. Tracing takes place.

Diagnostics Aid for IMS Database Repair Facility

If you have a problem that you think is not a user error, run the Diagnostics Aid (FABZDIAG) to obtain the Load Module APAR Status report and the Clist APAR Status report. Then, attach them to the other diagnostic documents (such as job dump list or I/O of the utility) and report the error to IBM.

The Diagnostics Aid generates a Load Module APAR Status report and a Clist APAR Status report. These reports show the latest APAR fixes that are applied to each module and clist.

The Diagnostics Aid is not applicable for any other versions or releases.

How to run Diagnostics Aid with JCL

To run the Diagnostics Aid (FABZDIAG), supply an EXEC statement and a DD statement that defines the output data set.

EXEC

This statement must be in the following form:

```
//stepname  EXEC PGM=FABZDIAG
```

STEPLIB DD

This statement defines the library that contains the load modules (usually HPS.SFABLMD0).

SHPSLMD DD

This statement defines the library that contains the load modules (usually HPS.SFABLMD0) for which you have a problem.

The Load Module APAR Status report is not generated if this DD statement is not provided or if DD DUMMY is specified.

It is always recommended that you specify this DD statement.

SHPSCLIB DD

This statement defines the library that contains the provided clist (usually HPS.SFABCLIB) for which you have a problem. The Clist APAR Status report is not generated if this DD statement is not provided or if DD DUMMY is specified.

SYSPRINT DD

This output data set contains the Load Module APAR Status report and the Clist APAR Status report. The data set contains 133-byte, fixed-length records. It can reside on a tape, direct-access device, or printer; or it can be routed through the output stream. If BLKSIZE is coded in the DD statement, it must be a multiple of 133. However, it is recommended that you use:

```
//SYSPRINT  DD SYSOUT=A
```

Load Module/Clist APAR Status report

The Diagnostics Aid generates the following two reports for the maintenance by IBM: Load Module APAR Status report and Clist APAR Status report.

Load Module APAR Status report

This report contains the following information:

MODULE LIBRARY

The data set names that are specified in the SHPSLMD DD statement. If more than 30 data sets are concatenated, only the first 30 data sets are listed.

MODULE NAME

The name of the load module member or the alias.

ALIAS-OF
The name of the original member of the alias. If the module name is not an alias, this field is left blank.

CSECT NAME
The name of the included CSECT in the module. The CSECT names are reported in the included order in the module.

APAR NUMBER
The latest APAR number that is applied to the module represented by the CSECT name. If no APAR is applied, NONE is shown.

APAR FIX-DATE
The date when the modification was prepared for the module represented by the CSECT name. If no APAR is applied, N/A is shown.

Notes:

1. If the CSECT name does not start with *FAB, HPS,* or the program structure of the CSECT does not conform to the IMS Database Repair Facility module standard to identify the APAR number and the APAR fixed date, the fields APAR NUMBER and APAR FIX-DATE are filled with asterisks (*).
2. If the load module is a member of the PDSE library, the following statement is shown on the report line and the job completes with a return code of 4.

```
** IT CAN NOT BE ANALYZED DUE TO PDSE LIBRARY MEMBER **
```

3. If the load macro fails for a utility member, the following statement is shown on the report line and the job completes with a return code of 8.

```
** IT CAN NOT BE ANALYZED DUE TO LOAD FAILED MEMBER  **
```

Clist APAR Status report

This report contains the following information:

CLIST LIBRARY
The data set names that are specified in the SHPSCLIB DD statement. If more than 30 data sets are concatenated, only the first 30 data sets are listed.

CLIST NAME
The name of the clist member or the alias.

ALIAS-OF
The name of the original member of the alias. If the clist name is not an alias, this field is left blank.

APAR NUMBER
The latest APAR number that is applied to the clist. If no APAR is applied, NONE is shown.

APAR FIX-DATE
The date when the modification was prepared for the clist. If no APAR is applied, N/A is shown.

Diagnostics Aid messages and codes

The following topics describe the messages and codes of FABZDIAG.

Diagnostics Aid return codes

FABZDIAG contains the following return codes:

0
Successful completion of the program.

4
Warning messages were issued, but the requested operation was completed.

8
Error messages were issued, but the request operation was completed.

Diagnostics Aid abend codes

All 36*xx* abend codes are accompanied by an FABU36*xx* message. Refer to the appropriate message for problem determination.

Diagnostics Aid messages

Use the information in these messages to diagnose and solve FABZDIAG problems.

FABU1001I DIAG ENDED NORMALLY

Explanation

This message is generated when Diagnostic Aid completes successfully.

System action

Diagnostic Aid completes the job successfully with a return code of 0.

User response

None. This message is informational.

FABU1002W DIAG ENDED WITH WARNINGS

Explanation

This message is generated when trivial error conditions are encountered by Diagnostic Aid.

System action

Diagnostic Aid ends with a return code of 4.

User response

Refer to other messages generated by Diagnostic Aid to determine the nature and the cause of the detected errors. Correct the problem and rerun the job.

FABU1003E DIAG ENDED WITH ERRORS

Explanation

This message is generated when severe error conditions are encountered by Diagnostic Aid.

System action

Diagnostic Aid ends with a return code of 8.

User response

Refer to other messages generated by Diagnostic Aid to determine the nature and the cause of the detected errors. Correct the problem and rerun the job.

FABU1005W [SHPSLMD | SHPSCLIB] DD STATEMENT NOT FOUND

Explanation

Diagnostic Aid could not find the SHPSLMD or the SHPSCLIB DD statement.

System action

Diagnostic Aid sets an end-of-job return code of 4 and continues processing. Diagnostic Aid does not generate a report for the load module or the clist.

User response

If you intended to specify the indicated DD statement, correct the error and rerun the job.

FABU1006W DUPLICATE *member name* IN LIBRARY DDNAME *ddname*

Explanation

Diagnostic Aid found a duplicated member in the concatenated libraries.

System action

Diagnostic Aid uses the member that is first found in the concatenated libraries. Diagnostic Aid sets an end-of-job return code of 4 and continues processing.

User response

Ensure which libraries have correct module/clist libraries. Correct the error and rerun the job if necessary.

FABU1007W DUMMY SPECIFIED FOR [SHPSLMD | SHPSCLIB] DD STATEMENT

Explanation

DUMMY was specified for the SHPSLMD or the SHPSCLIB DD statement.

System action

Diagnostic Aid sets an end-of-job return code of 4 and continues processing. Diagnostic Aid does not generate a report for the load module or the clist.

User response

If you did not intend to specify the dummy DD statement, correct the error and rerun the job.

FABU1008W NO [MODULE | CLIST] MEMBERS FOUND IN DDNAME [SHPSLMD | SHPSCLIB]

Explanation

Diagnostic Aid could not find any utility modules or clist members from the DD ddname data set.

System action

Diagnostic Aid sets an end-of-job return code of 4 and continues processing.

User response

Ensure that the libraries have correct utility module or clist libraries. Correct the error and rerun the job.

FABU2001E LOAD FAILED FOR DDNAME *ddname* MODULE *member*

Explanation

Diagnostic Aid could not load a *member name* from *ddname*.

System action

Diagnostic Aid sets an end-of-job return code of 8 and continues processing.

User response

Ensure that the member indicated exists in the data set specified for the indicated *ddname*. Correct the error and rerun the job.

FABU3600E OPEN FAILED FOR DDNAME *ddname*

Explanation

The named DCB could not be opened.

System action

Diagnostic Aid ends with an abend code of U3600.

User response

Ensure that a *ddname* DD statement exists, and that it specifies the correct DD parameter. Correct any errors, and rerun the job.

FABU3601E GET FAILED FOR DDNAME *ddname*

Explanation

The GET failed for a directory from the DD *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3601.

User response

Refer to the MVS system message and its programmer response. Correct the error and rerun Diagnostic Aid. If the error persists, contact IBM Software Support.

FABU3602E READ FAILED FOR DDNAME *ddname* MEMBER *member*

Explanation

The READ failed for a *member* from the DD *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3602.

User response

Refer to the MVS system message and its programmer response. Correct the error and rerun Diagnostic Aid. If the error persists, contact IBM Software Support.

FABU3603E BLDL FAILED FOR DDNAME *ddname* MEMBER *member*

Explanation

The *member* was not found when the BLDL macro searched the PDS directory for the *ddname*.

System action

Diagnostic Aid ends with an abend code of U3603.

User response

Ensure that the member indicated exists in the data set specified for the indicated ddname. Correct the error and rerun the job. If the error persists, contact IBM Software Support.

FABU3604E LOAD FAILED FOR DDNAME *ddname* MODULE *member*

Explanation

Diagnostic Aid could not load the *member name* from the *ddname*.

System action

Diagnostic Aid ends with an abend code of U3604.

User response

Refer to the MVS system message and its programmer response. Correct the error and rerun Diagnostic Aid. If the error persists, contact IBM Software Support.

FABU3605E DELETE FAILED FOR MODULE *member*

Explanation

Diagnostic Aid could not delete a *member name*.

System action

Diagnostic Aid ends with an abend code of U3605.

User response

Contact IBM Software Support.

FABU3606E PUT FAILED FOR SYSPRINT

Explanation

Diagnostic Aid could not put report data in SYSPRINT.

System action

Diagnostic Aid ends with an abend code of U3606.

User response

Refer to the MVS system message and its programmer response. Correct the error and rerun Diagnostic Aid. If the error persists, contact IBM Software Support.

FABU3607E OPEN FAILED FOR SYSPRINT

Explanation

SYSPRINT DCB could not be opened.

System action

Diagnostic Aid ends with an abend code of U3607.

User response

Ensure that a *ddname* SYSPRINT DD statement exists, and that it specifies the correct DD parameter. Correct any errors, and rerun the job.

FABU3608E FIND FAILED FOR DDNAME *ddname* MEMBER *member*

Explanation

The FIND failed for a *member* from DDNAME *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3608.

User response

Ensure that the member indicated exists in the data set specified for the indicated ddname. Correct the error and rerun the job. If the error persists, contact IBM Software Support.

FABU3609E DEVTYPE FAILED FOR DDNAME *ddname*

Explanation

The DEVTYPE failed for a DDNAME *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3609.

User response

Contact IBM Software Support.

FABU3610E RDJFCB FAILED FOR DDNAME *ddname*

Explanation

The READJFCB failed for a DDNAME *ddname* data set.

System action

Diagnostic Aid ends with an abend code of U3610.

User response

Contact IBM Software Support.

FABU3611E GETMAIN FAILED. INSUFFICIENT STORAGE TO RUN THE JOB

Explanation

Work space for Diagnostic Aid could not be obtained.

System action

Diagnostic Aid ends with an abend code of U3611.

User response

Increase the region size and rerun the job.

FABU3612E TOO MANY [MODULE | CLIST] MEMBERS DETECTED IN DDNAME [SFABMOD | SHPSCLIB]

Explanation

There are too many utility members in the SFABMOD or the SHPSCLIB DD data set.

System action

Diagnostic Aid ends with an abend code of U3612.

User response

Specify the correct data set for the indicated DD statement and rerun the job.

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