CA IDMS - 19.0
Using ADS Trace

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<td>48</td>
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</tr>
</tbody>
</table>
Using ADS Trace

The online trace of a dialog, or of specific processes within a dialog, provides a convenient, efficient method of searching for errors. The flexible organization of CA ADS Trace allows comprehensive tracing or selective tracing of:

- Control commands
- Specified element values
- Database verbs
- DEFINE SUBROUTINE statements
- A specified segment of a process.

CA ADS Trace adds the necessary statements to the dialog code automatically. After the traced dialog is executed, a replay can be viewed at a terminal, printed, or moved to a special queue.

During execution of an CA ADS dialog, CA ADS Trace produces an online trace that can be replayed as often as necessary. By using this trace utility, programmers and application developers can pinpoint the causes of dialog errors right at their terminals. For more information, see the following topics:

- Online Trace (see page 8)
- CA ADS Trace Access (see page 12)
- Trace Generation Overview (see page 28)
- ADS Trace Replay (see page 44)

Online Trace

Building the Trace

Before a specific dialog is executed, you can select trace options from a special screen. Using those options, CA ADS Trace automatically enters the trace code in the dialog.

Replaying the Trace

After the dialog is recompiled and executed with the selected trace options, a trace replay can be viewed, printed, or saved in a queue. If the dialog execution terminates abnormally, the replay shows the sequence of execution right up to the termination; CA ADS Trace preserves the sequence in the replay, without any rollback.
CA ADS Trace traces not only the specified dialog, but also all subroutines through which dialog control passes. While the dialog is executing, the Trace option captures and highlights information on DML command processing and the DML error status. It can also trace the execution-time contents of any exhibited dialog work record, database field, or map variable.

For more information, see the following topics:
- Environment (see page 9)
- Flexibility (see page 9)
- Typical Session (see page 11)

Environment

CA ADS Trace operates under CA IDMS and CA ADS. It provides full-screen display on all IBM 3270-type terminals.

Flexibility

Contents
- Easy Selection of Options (see page 9)
- Trace Options (see page 9)
- Replay Options (see page 10)
- View Replay Options (see page 10)

CA ADS Trace is a flexible tool. It allows tracing of a particular dialog without affecting the execution of that dialog at another terminal. You can easily make a variety of choices.

Initially, you select trace options for trace generation. After the traced dialog is executed, you select replay options. Then, you can use several commands and PF keys to select options for viewing the replay.

Easy Selection of Options

You make selections from menus and formatted selection screens. PF keys facilitate moving to other functional screens, or paging up and down through a series of screens.

Trace Options

When specifying trace options, you can:
- Direct CA ADS Trace to enter the trace code automatically, by entering a single letter next to the process name on the Build Trace Code screen.
- Exclude control commands from the trace.
• Trace only DEFINE SUBROUTINE commands. (After reviewing the trace replay that shows the
  DEFINE SUBROUTINE commands, you can decide whether or not to trace the whole dialog or part
  of the dialog, and which options to use.)
• Direct CA ADS Trace to display the execution-time contents of any exhibited dialog work records,
  database fields, or map variables.
• Direct the Trace option to display user-supplied literal statements so that specific events in the
  trace replay will be highlighted.
• Direct the Trace option to trace a segment of the dialog (internal trace), marked by TRACE ON and
  TRACE OFF statements.
• Select individual process modules for tracing (and exclude other process modules). This feature is
  especially useful in a complex transaction with many transfers of control.
• Trace only database verbs. After each database verb, the trace replay shows the error status of
  the verb.
• Limit the number of lines to be stored in the scratch area.
• Specify a Generate Wait Interval to control the number of times the interrupt routine is called
  during module trace generation.
• Review the status of existing traced processes and dialogs.
• Remove trace statements from a process or dialog.

Replay Options
Once the dialog is traced, you can:
• Display the trace replay on the screen.
• Print the trace replay.
• Move the trace replay into a queue for later observation. On the Move Replay screen, you can
  enter a 20 character description indicating the purpose of the trace, or other information, to help
  identify which trace it is.
• Delete the trace replay.
• Recall a replay from the queue, for viewing or printing.

View Replay Options
The system displays the trace replay on the screen in pages that each contain 15 lines of trace data.
You can:
• Scroll up and down among the pages.
Search for a particular string of characters.

Skip up or down any specified number of lines.

Switch directly to the Move, Print, or Delete screen.

Typical Session

In a typical session, a programmer might be trying to debug a dialog that terminates abnormally when executed. The sequence of events shown in Figure 1.1 illustrates a session where the programmer uses CA ADS Trace to help find the errors in a dialog that terminated abnormally.

The programmer wants to see the values of designated elements exhibited when the trace is replayed, and also wants special literal statements displayed in the replay for quick reference. The programmer can add exhibit and literal statements to the code before accessing CA ADS Trace by using CA IDMS DME.

When CA ADS Trace is accessed in the typical session described here, the first choice is Build Trace Code. On the Build Trace Code screen, the programmer names the dialog and selects the trace options.

When the options have been entered, the system begins automatically placing trace code in the dialog. A confirmation message in the message area signals that the trace code has been built. After the trace code is in the dialog, the programmer adds a special work record to the dialog, and then recompiles and executes it.

When the execution has terminated (in this example, abnormally), a replay of the trace is ready and is listed on the Select Replay screen of CA ADS Trace. The programmer scrolls through the replay to find the cause of termination.

When a TRACE OFF option is entered on the Build Trace Code screen, CA ADS Trace automatically removes the trace statements. To correct errors in the dialog, the programmer uses CA IDMS DME.

The programmer must then remove the special work record from the dialog. When this step is complete, the corrected dialog is recompiled and ready for normal execution. The following figure shows a typical CA ADS Trace session.
CA ADS Trace Access

To access the CA ADS Trace option, enter task code ADST at the System Prompt on the system’s main screen.
Entry Screen

Upon system access, CA ADS Trace displays the CA ADS Trace Entry screen. To proceed to the Main Menu, press the ENTER key.

Common Fields on Functional Screens

Several fields are common to all functional screens in CA ADS Trace. Here are descriptions of the fields designated by numbers in the following screen.

Screen title

Current time -- In the format hh:mm:ss, where the time is on a 24-hour clock.

Current date -- In the format mm/dd/yy.

Message

area -- CA ADS Trace messages appear in the third line of the screen. Complete explanations of all messages are in Section 6, Messages.
Main Menu

The Main Menu fields are described as follows:

**OPTION** -- The field in which to enter the number or letter of a menu selection.

**DICTIONARY** -- The name of the dictionary to which you are signed on. The first time the Main Menu is displayed, this field is blank. You can enter a dictionary name or use the default, which is the Primary dictionary. If you return to the Main Menu during a session, you can access another dictionary by typing over the dictionary name in this field.

**NODE** -- The DDS node in which the dictionary resides. If you enter the name of a secondary dictionary, be sure that the node and dictionary correspond.

**Menu Selections** -- Numbers and descriptions of the available options. In the OPTION field, you can enter any of the numbers 1 to 4, corresponding to the listed selections. To leave CA ADS Trace from the Main Menu, enter an X in the OPTION field or press CLEAR.

```
ADST   Rnn.nn   ADS/TRACE   MAIN MENU   hh:mm:ss   mm/dd/yy
OPTION ===> DICTIONARY ===> ACCT                        NODE ===> 
          1 - BUILD TRACE CODE
          2 - SELECT REPLAY
          3 - CREATE REPLAY FROM QUEUE
          4 - REVIEW TRACE STATUS
          X - EXIT ADS/TRACE
```

For more information, see the following topics:

- Conceptual View of CA ADS Trace (see page 14)
- Program Function Keys (see page 16)
- Trace Generation (see page 18)
- Trace Replay (see page 22)

Conceptual View of CA ADS Trace

This section presents an overview of the CA ADS Trace organization and the PF keys. It then describes a typical session, including compiling the traced dialog, executing the dialog, replaying the trace, and removing the trace code.

- Building a Trace (see page 15)
- Recompiling and Executing a Dialog (see page 16)
- Replaying the Trace (see page 16)
- Removing the Trace (see page 16)

CA ADS Trace performs two important functions—building the trace statements into the source code of the processes in a dialog, and replaying the trace after the dialog is executed. The following diagram outlines these functions.
Building a Trace

You can start automatic entry of trace statements into the source code by selecting an option from those listed on the Build Trace Code screen. (Before the trace code is built, you can add LITERAL or EXHIBIT statements to the source code. You can also add internal trace statements if you want to trace only a segment of a process.)
The Review Trace Status screen presents a record of which processes have traces turned on or off and what types of traces were applied to each process. From the Review Trace Status screen, you can position the cursor to select a process to go back to the Build Trace Code screen.

Recompiling and Executing a Dialog

After the trace statements are in place in the process source code, leave CA ADS Trace and enter the CA ADS Dialog Compiler (ADSC) to add a work record, recompile the dialog, and execute the dialog. When the dialog has executed successfully or terminated abnormally, a replay of the trace (up to the point of termination) is available back in CA ADS Trace.

Replaying the Trace

The Select Replay option from the Main Menu allows you to select viewing the replay at the terminal, moving it to a special queue, printing it, or deleting it.

Once a replay has been moved to the queue, the Create Replay from Queue screen allows a replay to be brought back to the active replay area. The Create Replay from Queue screen displays a list of the replays currently in the queue. You can select one of the replays to move to the Select Replay option screen, or delete one or more replays.

Removing the Trace

After reviewing the trace replay, return to the Build Trace Code screen and select TRACE OFF options, which direct CA ADS Trace to remove the trace statements from the source code. Finally, return to ADSC to remove the work record and recompile the dialog.

Program Function Keys

Program Function (PF) keys provide easy movement to another level or to scroll within a series of screens with more than one screen of data. PF3 through PF8 are not listed on the screens. The functions are described in following table and diagram.

<table>
<thead>
<tr>
<th>Key</th>
<th>Meaning Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEA EXIT R</td>
<td>Exit to CA-IDMS.</td>
</tr>
<tr>
<td>PF1 or PF13</td>
<td>Jump to Review Trace Status from Build Trace Code screen.</td>
</tr>
<tr>
<td>Build Code</td>
<td>Jump to Build trace code screen from Review Trace Status screen.</td>
</tr>
<tr>
<td>Key</td>
<td>Meaning Function</td>
</tr>
<tr>
<td>-------</td>
<td>------------------</td>
</tr>
<tr>
<td>PF2 or PF14</td>
<td>Exit to the next higher level. Select Replay from Delete Replay, Print Replay, Move Replay, or View Replay. To Create Replay from Confirm Delete.</td>
</tr>
<tr>
<td>PF15</td>
<td>END Return to the CA ADS Trace Main Menu.</td>
</tr>
<tr>
<td>PF4 or PF16</td>
<td>Select Replay from Delete Replay, Print, Move, or View Replay. To Create Replay from Confirm Delete.</td>
</tr>
<tr>
<td>PF5 or PF17</td>
<td>RETURN In a series of screens, go to the first page of the current display.</td>
</tr>
<tr>
<td>PF6 or PF18</td>
<td>TOP In a series of screens, go to the last page of the current display.</td>
</tr>
<tr>
<td>PF7 or PF19</td>
<td>BOTTOM Move the &quot;window&quot; one page toward the first page of the current display. CA ADS Trace replay screens indicate the current page and the number of pages in the series. Also used with SKIP and SEARCH commands.</td>
</tr>
<tr>
<td>PF8 or PF20</td>
<td>UP Move the &quot;window&quot; one page toward the last page of current display. CA ADS Trace replay screens indicate the current page and the number of pages in the series. Also used with SKIP and SEARCH commands.</td>
</tr>
<tr>
<td>PF9 or PF21</td>
<td>DOWN Move the &quot;window&quot; one page toward the last page of current display. CA ADS Trace replay screens indicate the current page and the number of pages in the series. Also used with SKIP and SEARCH commands.</td>
</tr>
<tr>
<td>PF10 or PF22</td>
<td>SELECT Replay Jump to Select Replay from Create Replay.</td>
</tr>
<tr>
<td>PF11 or PF23</td>
<td>MOVE Replay Jump to Move Replay from View Replay or from Print Replay.</td>
</tr>
<tr>
<td>PF12 or PF24</td>
<td>PRINT Replay Jump to Print Replay from View Replay.</td>
</tr>
<tr>
<td>PF13 or PF25</td>
<td>DELETE Replay Jump to Delete Replay from View Replay.</td>
</tr>
</tbody>
</table>
Trace Generation

Contents
- Adding EXHIBIT and LITERAL Statements (see page 19)
This section describes a typical sequence of events for trace generation. The events of the sequence are explained in more detail on the following pages. This is only one possible sequence. For descriptions of all possibilities, see Trace Generation (see page 18).

Adding EXHIBIT and LITERAL Statements

Before entering CA ADS Trace, add LITERAL and EXHIBIT statements at appropriate places in the source code of a specific process. The IDD Online Compiler can be used for this task (see the CA IDMS IDD DDDL Reference Section) Also, if you have installed the product, CA IDMS DME is an efficient tool for entering the statements.

Building Trace Code

Next, from the CA ADS Trace Main Menu, the user selects option 1, Build Trace Code. For this sample sequence, the dialog selected for tracing is in the primary dictionary, which is the default dictionary.

On the Build Trace Code screen, the user enters the dialog name. CA ADS Trace then redisplays the screen, showing the first ten processes of the specified dialog. The dialog version number defaults to 0001 because no version number was entered.

In the Trace On column, the user enters trace options for various processes. CA ADS Trace automatically inserts the appropriate trace code in the process and then comes back with a message for each process, indicating the trace option selected.

Adding Work Record, Regenerating Dialog, Executing Dialog

The user then leaves CA ADS Trace and enters ADSC, where the work record AT-LINK-RECORD (version 1) is added to the dialog. The dialog is then recompiled and executed.

Viewing the Replay

After the dialog has either executed successfully or terminated abnormally, the user signs back on to CA ADS Trace to view the replay. A typical replay sequence is described later in Typical Sequence (see page 22).
Building Trace Code

The following screen shows the Build Trace Code screen with a dialog name entered. Here are descriptions of the fields.

**DIALOG NAME** -- The user enters the name of the dialog to be traced in the space under DIALOG NAME. In the following figure the user has entered a dialog module named ACDPAY01. After the dialog name is entered, CA ADS Trace responds by listing the processes in the dialog.

**VER** -- The version number of the dialog. The user can enter a version number or use the default. The default is 0001. The second screen shows the Build Trace Code screen after the dialog name has been processed.

**PROCESSES** -- The names of the processes in the dialog.

**TRACE ON** -- The column in which letters indicating the trace options are entered for each process to be traced. The trace options are listed at the bottom of the screen. You can choose one or more of the processes.

<table>
<thead>
<tr>
<th>DIALOG</th>
<th>TRACE</th>
<th>NAME</th>
<th>VER</th>
<th>MESSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACDPAY01</td>
<td>A</td>
<td>ACDPAY01-PM-GET-DATE</td>
<td>TRACE ON</td>
<td></td>
</tr>
<tr>
<td>VER 0001</td>
<td>X</td>
<td>ACDPAY01-RP-PF15-EXIT</td>
<td>TRACE OFF</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>ACDPAY01-RP-PF3-END</td>
<td>TRACE OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>ACDPAY01-RP-PF7-UP</td>
<td>TRACE ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PF1=REVIEW TRACE STATUS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Confirmation**

The following screen shows the Build Trace Code screen after CA ADS Trace has inserted trace code in the processes.
Confirmation Message -- The message PROCEED WITH ADSC FOR TRACED DIALOGS - INCLUDE AT-LINK-RECORD appears in the common message area as a reminder to the user to include AT-LINK-RECORD (version 1) on the ADSC work record screen.

MESSAGES -- The generator confirms the options selected by displaying a message next to each traced process.

<table>
<thead>
<tr>
<th>PROCESS NAME</th>
<th>VER</th>
<th>TRACING OPTION</th>
<th>USER ID</th>
<th>DATE</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACDPAY01-PM-GET-DATE</td>
<td>0001</td>
<td>TRACE ON</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
<tr>
<td>ACDPAY01-RP-PF15-EXIT</td>
<td>0001</td>
<td>TRACE ON</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
<tr>
<td>ACDPAY01-RP-PF3-END</td>
<td>0001</td>
<td>SUBRTN TRACE ON</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
<tr>
<td>ACDPAY01-RP-PF7-UP</td>
<td>0001</td>
<td>TRACE OFF</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
<tr>
<td>ACDPAY01-RP-PF8-DOWN</td>
<td>0001</td>
<td>TRACE ON</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
</tbody>
</table>

Adding Work Record, Recompiling Dialog

The user presses the CLEAR key to exit the CA ADS Trace system, and the System Prompt screen appears. The user proceeds to ADSC, adds the AT-LINK-RECORD (version 1), and recompiles the dialog ACDPAY01.

Executing the Dialog

After the dialog is recompiled, it is executed.

Reviewing Trace Status

The Review Trace Status screen lists dialogs that have been recompiled. The following screen shows an example of processes listed on this screen. By placing the cursor on one of the process names in the list and pressing PF2, the user can transfer the process name and version to the Build Trace Code screen. CA ADS Trace automatically enters the name and version of the dialog.

<table>
<thead>
<tr>
<th>PROCESS NAME</th>
<th>VER</th>
<th>TRACING OPTION</th>
<th>USER ID</th>
<th>DATE</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACDPAY01-PM-GET-DATE</td>
<td>0001</td>
<td>TRACE ON</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
<tr>
<td>ACDPAY01-RP-PF15-EXIT</td>
<td>0001</td>
<td>TRACE ON</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
<tr>
<td>ACDPAY01-RP-PF3-END</td>
<td>0001</td>
<td>SUBRTN TRACE ON</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
<tr>
<td>ACDPAY01-RP-PF7-UP</td>
<td>0001</td>
<td>TRACE OFF</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
<tr>
<td>ACDPAY01-RP-PF8-DOWN</td>
<td>0001</td>
<td>TRACE ON</td>
<td>TPC12251</td>
<td>mmddyy hhmm</td>
<td></td>
</tr>
</tbody>
</table>
Trace Replay

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- Typical Sequence (see page 22)
- Selecting a Replay (see page 22)
- Printing the Replay, Moving the Replay to a Queue (see page 23)
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- Removing a Trace (see page 23)
- Correcting an Error (see page 23)
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- Selecting Replay Options (see page 23)
- Common Fields on Replay Screens (see page 24)
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- Recompiling Dialog (see page 28)

Typical Sequence

The following pages more fully describe a typical sequence of events in a trace replay. This sequence is a sample sequence. Trace Replay (see page 22) gives complete details of every replay option.

Selecting a Replay

From the Main Menu, the user enters option 2 to select the Select Replay screen. On the Select Replay screen, CA ADS Trace displays a list of current replays. By entering a V (View Replay) in the OPT (option) column, the user selects a display of the replay on the terminal.

The user reviews the replay of the trace, scrolling up and down by pages, by number of lines, or to the top or bottom of the replay. CA ADS Trace has added information lines. The replay also shows the values of exhibits and any literals entered by the user.
Printing the Replay, Moving the Replay to a Queue

At the end of the day, the user presses PF11 to access the Print Replay screen and print the replay. Then he/she presses PF10 to access the Move Replay screen and move the replay to a queue. The user then exits CA ADS Trace by pressing the CLEAR key.

Creating a Replay from a Queue

The next day, the user creates the replay from the queue, studies it a while, and, since a printed copy exists, deletes it. CA ADS Trace confirms the delete request before carrying it out. While studying the printed copy of the replay, the user finally finds an error in the process.

Removing a Trace

To remove the trace code from the dialog, the user enters an A in the TRACE OFF column on the Build Trace Code screen. CA ADS Trace removes all trace code created by CA ADS Trace, as well as the exhibit and literal statements entered by the user, and then displays a TRACE OFF message next to the process name.

Correcting an Error

The user exits CA ADS Trace and corrects the error in the source code.

Removing the Work Record, Recompiling the Dialog

Before executing the dialog in the application, the user goes into ADSC, removes the work record, and recompiles the dialog.

Selecting Replay Options

The Select Replay screen is chosen from the Main Menu. It functions as a secondary menu of replay options. On the display is a list of dialogs for which replays exist. This screen offers four choices:

- View Replay
- Move Replay
- Print Replay
- Delete Replay.
On the sample screen the user placed a V in the OPT (option) column to view the replay at the terminal.

Common Fields on Replay Screens

Several fields are common to the replay screens.

DICTIONARY -- Name of the dictionary. This field is only for information. To change the dictionary, return to the Main Menu.

REPLAY NUMBER -- The number assigned to this replay of the dialog. Every time the dialog is executed with the trace on, a new number is assigned for the replay of each process. If three processes are traced within the dialog, each process is assigned a different number.

Replays moved back from the queue receive new numbers. The total number of replay numbers that can be assigned for one dialog is 100. To generate more replays after this limit is reached, leave CA-IDMS or sign off on the System Prompt screen. This action clears the scratch area.

DIALOG -- Name of the dialog.

VERSION NBR -- The version number of the dialog.

Viewing the Replay

The following screen shows a page of a sample trace replay. You can move between screens by using PF7 and PF8 for UP and DOWN, or PF5 and PF6 for the first and last pages of the display.

Here are descriptions of the fields.

LINE nnnn OF nnnn -- The line number of the line at the top of the display and the total number of lines in the display.

SKIP -- The number of lines to skip up or down. Enter a number in this field and press PF7 or PF8 to move up or down a specified number of lines.
SEARCH -- An alphanumeric character string to be found. Type in up to 20 characters (including blanks) and press PF7 or PF8 to initiate the search. PF7 initiates an upward search, toward line 1. PF8 initiates a downward search, toward the last line.

Line Number

Trace Descriptor -- A word that identifies the type of trace content that follows.

Trace Content -- Contents of the trace at the current point in execution of the dialog.

PF Keys -- Special PF keys assigned to this screen.

Examples of data lines

In the typical sequence of events, after viewing the replay, the user presses PF11 to print the replay.

ADST Rnn.nn VIEW REPLAY hh:mm:ss mm/dd/yy
DICTIONARY: DEMO LINE: 16 OF: 19
ATRP007I END OF ADS/O TRACE DATA
REPLAY NUMBER: 2 DIALOG: ICDVPL01 VERSION NBR: 0001
SKIP: SEARCH:
16 DBACCESS OBTAIN NEXT PART WITHIN VENDOR-PART.
17 DBACCESS ERROR-STATUS = 0000
18 DBACCESS OBTAIN NEXT PART WITHIN VENDOR-PART.
19 DBACCESS ERROR-STATUS = 0307

PF10=MOVE REPLAY PR11=PRINT REPLAY PF12=DELETE REPLAY

Printing the Replay

The following screen shows the Print Replay screen. The field descriptions are listed below.

PRINT OPTION -- Enter P to print the replay. You can then switch directly to the Move Replay screen by pressing PF10, or return to the Select Replay screen (PF3) or to the Main Menu (PF4).

Enter D to both print and delete the replay.

PRINTER CLASS -- Enter an integer from 1 through 64 to designate the printer class.

Default value: 1

PRINTER DESTINATION -- (optional) Enter a destination for the printer. If you enter a printer destination, do not enter a printer class.

LINES PER PAGE (50 THRU 99) -- Enter the number of lines per page for printing replays.

Default value: 55

In the typical sequence, after printing the replay, the user presses PF10 to access the Move Replay screen.

ADST Rnn.nn PRINT REPLAY hh:mm:ss mm/dd/yy
DICTIONARY: ACCT
REPLAY NUMBER: 3 DIALOG: ACDPAY01 VERSION NBR: 0001
OPTIONS: P=PRINT REPLAY D=PRINT REPLAY AND DELETE
PRINT OPTION:
Moving the Replay to a Queue

The field descriptions listed below correspond to the fields on the Move Replay screen shown below.

**REPLAY DESCRIPTION** -- A brief description (up to 20 characters) that helps you identify the trace replay. The description is displayed on the Create Replay from Queue screen where this replay is listed.

**QUEUE FILE RETENTION PERIOD** -- The time period, in days, indicating how long this particular replay is to be retained in the queue file.

Default: 1 day

When these fields have been entered, the Move Replay screen reappears with a message that the replay has been moved to the queue.

When the replay is moved to the queue, it is deleted from the scratch area. The user cannot choose this replay from the Select Replay screen without creating it from the queue.

In the typical sequence, the user presses CLEAR to exit to the System Prompt screen. After lunch, the user comes back to CA ADS Trace and selects option 3, Create Replay from Queue.

Creating a Replay from the Queue

The following screen shows the CA ADS Trace Create Replay from Queue screen, with the names of all dialogs that have been copied to the replay queue file. If there are more replays listed than will fit on one screen, use the PF keys for scrolling up and down.

In the typical sequence of replay events, the user enters a C in the OPT (option) column. The C instructs CA ADS Trace to send the replay back to the replay selection list on the View Replay screen. When a replay has been created from the queue, it is deleted from the queue.

PF9=SELECT REPLY
Deleting a Replay

After viewing the replay for a while, the user deletes it, because a printed copy exists. When PF12 is pressed, the Delete Replay screen is displayed so the deletion can be confirmed.

Preparing Dialog for Normal Use

Before using the traced process in the dialog, you must remove the trace statements, correct the errors in the dialog, remove the work record from the source code, and recompile the dialog.

Removing Trace Code

To remove trace statements, reenter CA ADS Trace and access the Build Trace Code screen. Enter either an A or an X in the TRACE OFF column. If you enter an A, the system removes all of the trace code, including user-entered EXHIBIT and LITERAL statements, and displays a TRACE OFF message next to the process name. The following screen is an example of the Build Trace Code screen with TRACE OFF options entered.

Correcting an Error

In this typical sequence, the user finds the error in the process while studying the printed copy of the replay. You can correct an error by leaving CA ADS Trace and modifying the source code with CA IDMS DME or CA IDMS IDD Online.
Removing Work Record

Leave CA ADS Trace, enter ADSC, and remove the work record by spacing over the entry in the WK field on the Work Record screen.

Recompiling Dialog

Recompile the dialog.

Trace Generation Overview

This section contains an overview of trace generation, and an alphabetically organized reference section containing complete descriptions of all of the procedures used in generating or removing the trace.

- Introduction to Trace Generation (see page 29)
- Add Exhibits and Literals (see page 31)
- Access CA ADS Trace (see page 31)
- Build Trace Code (see page 31)
- Add Work Record, Recompile and Execute Dialog (see page 31)
- Review Trace Status of Dialogs (see page 31)
- Multiple Users (see page 32)
- Changing the Trace Option (see page 32)
- Specifying Trace Options (see page 32)
- Trace Entire Dialog (see page 33)
- Trace Processes Within a Dialog (see page 33)
- Trace Included Modules (see page 33)
- Completing Trace Generation (see page 34)
- Change the Trace Option (see page 34)
- Trace Selection Tables (see page 34)
- Trace On Selections (see page 35)
- Trace Off Selections (see page 35)
- Trace Generated Only if Command is First Word (see page 36)
- DATABASE VERBS ONLY (V) (see page 36)
- DEFINE SUBRTN ONLY (D) (see page 37)
- EXHIBITS (see page 37)
- Removing EXHIBIT Statements (see page 37)
- EXHIBITS ONLY (E) (see page 38)
- Generate Wait Interval (see page 38)
- INCLUDE (IN) (see page 38)
- Tracing Only an Included Process (see page 39)
- Included Process in Several Dialogs (see page 39)
- Internal Trace (I) (see page 39)
Introduction to Trace Generation

The following diagram illustrates the procedure for trace generation.
Introduction (1)
Add Exhibits and Literals

If element values (exhibits) or literal statements are to be displayed in the trace, add them before accessing CA ADS Trace. You can insert them directly into the source code by using the CA IDMS DME (Dictionary Module Editor). At this time, you can also add TRACE ON and TRACE OFF statements for an internal trace.

Access CA ADS Trace

Then, from the System Prompt screen, enter the task code for CA ADS Trace. At the CA ADS Trace entry screen, press the ENTER key, and the CA ADS Trace Main Menu is displayed. For trace generation, select the Build Trace Code screen from the menu.

Build Trace Code

The Build Trace Code screen lists several options. After the options have been entered for the processes to be traced, CA ADS Trace automatically enters appropriate statements in the source code for the processes, and then displays a message opposite each process name. The message indicates which trace option was applied to the process.

Add Work Record, Recompile and Execute Dialog

After the trace statements have been added to the process source code, you must specify, on the the CA ADS Dialog Compiler (ADSC) Work Record screen, the CA ADS Trace work record (AT-LINK-RECORD, version 1) for the dialog. The dialog can then be recompiled and executed.

Whether the dialog executes successfully or not, a replay of the trace is ready in CA ADS Trace. If the dialog terminated abnormally, the trace continues right up to the termination, with no rollback. If abnormal termination occurs before any trace statements in the dialog, no lines appear under the header in the replay.

Trace Replay (see page 22), describes replay alternatives.

Review Trace Status of Dialogs

To see which dialogs currently contain trace statements, select Review Trace Status, option 4, from the Main Menu.

```
ADST Rnn.nn REVIEW TRACe STATUS hh:mm:ss mm/dd/yy
DICTIONARY: ACCT PAGE: 1 OF: 1
USER ID: TPC12251

PROCESS NAME VER TRACE OPTION USER ID MMDDYY HHHH
ACDPAY01-PM-GET-DATE 0001 TRACE ON TPC12251 mmmddyy hhhmm
ACDPAY01-RP-PF15-EXIT 0001 TRACE ON TPC12251 mmmddyy hhhmm
```
When the Review Trace Status screen appears, the USER ID field is blank, and all traced processes are
listed. To obtain a list of the processes traced by only one user, key in the user id and press ENTER.

From the Review Trace Status screen, you can select one of the processes and pass it to the Build
Trace Code screen by positioning the cursor anywhere on the process name and pressing PF2. CA ADS
Trace automatically lists the dialog name and version on the Build Trace Code screen.

**Multiple Users**

If another user is going to execute a dialog containing a process that already has trace statements in
it, the AT-LINK-RECORD, version 1, must be added on the work record screen in ADSC before the
dialog can be recompiled. The second user can check the Review Trace Status screen to see if there
are trace statements in any processes being used.

**Changing the Trace Option**

When you want to change a trace option, you do not need to remove the trace before entering the
new option on the Build Trace Code screen. For example, if a process was traced using the Define
Subroutine option (D), you can then access the Build Trace Code screen and enter an A for Trace All
with Control. CA ADS Trace removes the old trace and applies the new one.

**Specifying Trace Options**

Use the Build Trace Code screen to specify the dialog or process names in which tracing is to be
turned on or turned off. Enter a dialog name and its version number (default: version 0001), or one or
more process names (but not both a dialog name and process names at the same time).

```
ADST         Rnn.nn BUILD TRACE CODE   hh:mm:ss mm/dd/yy
DICTIONARY:    ACCT PAGE:  1  OF:  1
DIALOG TRACE
NAME    ON OFF PROCESS NAME VER N MESSAGE

ACDPAY01   A
VER 0001

TRACE ON OPTIONS --
A=TRACE ALL WITH CTL
X=TRACE ALL NO CTL
D=DEFINE SUBRTN ONLY
E=EXHIBITS ONLY
V=DB VERBS ONLY
I=INTERNAL TRACE
PF1=REVIEW TRACE STATUS

REPLAY LINES LIMIT: 3000
LINES AVAILABLE: 3000
GENERATE WAIT INTERVAL: 75
```
Trace Entire Dialog

If you enter a dialog name plus one of the TRACE ON or TRACE OFF options, the generator automatically applies the option specified to all the processes associated with the dialog name entered. This is a fast method of generating trace statements for the entire dialog.

Trace Processes Within a Dialog

If you key in only a dialog name and then press the ENTER key, CA ADS Trace retrieves all the processes associated with the dialog, and displays the current trace status of each process. You can then enter the trace options to the left of each process name.

Each process may have its own unique TRACE ON or TRACE OFF option. For example, the premap process can have TRACE ALL, option X, turned on, and the response process can have DEFINE SUBRTN ONLY, option D, turned on. Only code that corresponds to the TRACE ON option specified for a process will be generated.

Trace Included Modules

CA ADS Trace does not trace included modules unless you key in the name of the process, indicate an option, and place any character in the IN column. For more information, see INCLUDE (IN) (see page 38).

⚠️ Note: If trace statements are inserted in processes that are used by other dialogs, those dialogs cannot be recompiled unless you add the AT-LINK-RECORD, version 1, to the work record screen in ADSC. Consider carefully adding trace statements to processes that already execute successfully.
Completing Trace Generation

Once trace statements have been entered in the code, the message TRACE ON or the message TRACE ON/EXHIBIT ON appears, confirming the insertion of trace statements in the code.

Then proceed to ADSC, add the special work record, and recompile the traced dialog. Once the dialog has been successfully recompiled, it is ready for execution as usual. As the dialog executes, CA ADS Trace accumulates trace statistics that are transparent to the application developer. When the dialog has been executed, the CA ADS Trace replay facility is ready to playback the dialog’s execution path.

Change the Trace Option

If you want to change the trace option for a process, access the Build Trace Code screen and enter the new option in the TRACE ON column. CA ADS Trace removes any unnecessary trace statements before inserting the new statements.

Trace Selection Tables

The following tables show the selections available on the Build Trace Code screen, with brief descriptions of each alternative. The rest of this section gives complete information on each of these alternatives. They are presented in alphabetical order.
## Trace On Selections

<table>
<thead>
<tr>
<th>Selection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A TRACE ALL WITH CTL</td>
<td>Trace all control commands, DEFINE SUBROUTINE statements, exhibits, literals, and database commands.</td>
</tr>
<tr>
<td>X TRACE ALL NO CTL</td>
<td>Trace all of the above except control commands.</td>
</tr>
<tr>
<td>D DEFINE SUBRTN ONLY</td>
<td>Trace only DEFINE SUBROUTINE commands.</td>
</tr>
<tr>
<td>E EXHIBITS ONLY</td>
<td>Trace only the exhibit statements and display the values of the elements exhibited.</td>
</tr>
<tr>
<td>V DB VERBS ONLY</td>
<td>Trace only the database verbs and display the error status of each verb.</td>
</tr>
<tr>
<td>I INTERNAL TRACE</td>
<td>Trace the segment of the dialog marked by user-inserted trace statements. This option is equivalent to a TRACE ALL, except the trace applies only to a segment of the process module.</td>
</tr>
<tr>
<td>LINE LIMIT</td>
<td>For each dialog, place a limit on the number of lines to be stored in scratch, so that a loop does not fill up the space. 3000 to 5000. Default: 3000.</td>
</tr>
<tr>
<td>LINES AVAILABLE</td>
<td>Lists the number of lines remaining in the scratch area for this dialog.</td>
</tr>
<tr>
<td>GENERATE WAIT INTERVAL</td>
<td>Allows control of the number of times the interrupt routine is called during module trace generation. 1 to 500. Default: 75.</td>
</tr>
</tbody>
</table>

## Trace Off Selections

<table>
<thead>
<tr>
<th>Selection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A TRACE OFF ALL</td>
<td>Entered in the TRACE OFF column, removes all CA ADS Trace generated statements and all EXHIBIT and LITERAL statements. Regenerate the dialog.</td>
</tr>
<tr>
<td>X TRACE OFF GENERATED STATEMENTS</td>
<td>Entered in the TRACE OFF column, removes CA ADS Trace generated statements. Recompile the dialog.</td>
</tr>
<tr>
<td>I INCLUDE N</td>
<td>An X in the IN column shows that this process is an included module. At least one process in the list must not be an included module.</td>
</tr>
</tbody>
</table>
Trace Generated Only if Command is First Word

Trace statements are generated for commands only if one of the commands is the first word on a given source statement line. For example, in the statement

```
IF DB-STATUS-OK
   OBTAIN CALC CUSTOMER-RECORD.
```

trace statements are generated for the OBTAIN command because it is the first word on the line.

But in the statement

```
IF DB-STATUS-OK
   THEN OBTAIN CALC CUSTOMER-RECORD.
```

no trace statements are generated because the word THEN precedes the OBTAIN command.

DATABASE VERBS ONLY (V)

Use the DATABASE VERBS ONLY option to trace for only database verbs (and other commands listed below). The CA ADS Trace replay facility echoes the command and follows the command with the error status. See below for a list of commands that are traced.

CONNECT
DELETE QUEUE
DELETE SCRATCH
DISCONNECT
ERASE
FIND
GET
GET DETAIL
GET SCRATCH
MODIFY
OBTAIN
PUT DETAIL
PUT QUEUE
PUT SCRATCH
STORE
ROLLBACK

CA ADS Trace does not trace PUT NEW DETAIL and PUT CURRENT DETAIL commands.

Use this option as a shorthand method of determining which verbs the dialog went through at execution time. If you require further tracing information, select the TRACE ALL A or X option, and recompile the dialog.

DEFINE SUBROUTINE labels, control commands, exhibits, and literals are not traced when using this option.
DEFINE SUBRTN ONLY (D)

Use the DEFINE SUBRTN ONLY option to trace only DEFINE SUBROUTINE statements. The CA ADS Trace replay facility will show the DEFINE SUBROUTINE labels that the dialog went through during program execution.

Since database verbs and control commands are not traced when using this option, you can use it as a quick method of determining what the dialog did at execution time. Then, if you require further tracing information, select the TRACE ALL A or X option, and recompile the dialog.

EXHIBITS

An exhibit allows you to observe the specific value of an element as the dialog is executed. In most cases, exhibits are used with the TRACE ALL (A or X) option. The option EXHIBITS ONLY also traces exhibit statements.

Add EXHIBIT statements to the process code by using CA IDMS DME Here is the syntax:

```
EXHIBIT element-name
EXHIBIT element-name OF record-name
```

If you use an EXHIBIT statement as the first statement of a dialog, the statement must end with a period.

CA ADS Trace comments out the EXHIBIT statement and adds code acceptable to ADSC. The syntax of the commented EXHIBIT statement is:

```
!<> EXHIBIT element-name.
```

During subsequent trace generations, you do not need to uncomment this statement; CA ADS Trace recognizes this syntax and adds any code necessary to trace the value of the exhibited variable.

If exhibits for numeric data elements that have decimal points are specified, CA ADS Trace rounds up elements that have values of .5 to .9, and rounds down elements that have values of .1 to .4. For example, if you are exhibiting a field called WK-AMOUNT which has a picture of 999.99 and a value of 100.95, the CA ADS Trace replay shows this value as 101.00. Numeric elements which have no decimal points show the actual value.

Removing EXHIBIT Statements

When tracing is no longer desired, remove the EXHIBIT statements from the process source code or choose TRACE OFF option A. Entering an A in the TRACE OFF column directs CA ADS Trace to remove all trace statements, including EXHIBITS and LITERALS.
EXHIBITS ONLY (E)

Use the EXHIBITS ONLY option to trace only EXHIBIT statements. Database verbs, control commands, and DEFINE SUBROUTINE labels are not traced when using this option.

Generate Wait Interval

The GENERATE WAIT INTERVAL field on the Build Trace Code screen allows control of the number of times the interrupt routine is called during module trace generation. CA ADS Trace issues a HICCUP WAIT to remind CA IDMS that CA ADS Trace is still executing. This reminder prevents a runaway task abnormal termination from occurring during CA ADS Trace generation.

The valid range is from 1 to 500.

Default value: 75

This parameter can be useful when tracing modules that have few DEFINE SUBROUTINE, database verb, control command, or EXHIBIT statements (that is, modules which have many MOVE and/or COMPUTE statements). Since CA ADS Trace does not record the MOVE and COMPUTE statements, the operating system needs a reminder that CA ADS Trace is still running properly.

If the RUNAWAY INTERVAL defined in your CA IDMS sysgen is high (for example, 30 seconds), the default value, 75, can be used.

If the RUNAWAY INTERVAL defined in your CA IDMS sysgen is low (for instance, 10 seconds) a smaller CA ADS Trace generate wait interval should be used.

INCLUDE (IN)

CA ADS Trace allows tracing to be turned on or off for included modules. Included modules are not traced unless specifically designated. If you want to trace an entire dialog with tracing of an included module, enter the dialog name and version on the Build Trace Code screen. When the list of processes is displayed, enter trace options for the processes listed. Then key in the included process name and enter the appropriate TRACE ON option and any non-blank character in the IN column.

If the process is not designated in the IN column, CA ADS Trace generates extra subroutines for that process. When tracing is turned on for other non-included processes in the dialog, the following error messages occur during recompiling:

DC167062 DUPLICATE SUBROUTINE NAME
DC157008 UNRESOLVED CALL SUBROUTINE AT END OF PROCESS

If one of these messages appears, return to the Build Trace Code screen and enter a non-blank character in the IN column next to the included process name.
Tracing Only an Included Process

During development of a process that will be included in several dialogs, you may want to trace only that process, within a dialog. In that case, on the Build Trace Code screen, enter the process name and the trace option and leave the IN column blank. There must be at least one process in the dialog that is not marked in the IN column.

Included Process in Several Dialogs

If an included module (for example, a global response) is used in several dialogs, the included TRACE ON option affects all of the dialogs. To execute each dialog using a traced included process, you must add the AT-LINK-RECORD (version 1) in ADSC. The Review Trace Status screen shows which modules have a trace on.

Internal Trace (I)

You can use an internal trace if TRACE ON and TRACE OFF commands are included within the source module itself.

Any DEFINE SUBROUTINE, database verb, control command or EXHIBIT command encountered within the TRACE ON/TRACE OFF boundaries is traced. The internal trace is the same as a TRACE ALL WITH CONTROL (option A) within the boundaries.

Any commands outside the boundary are not traced. If EXHIBIT commands are placed outside the TRACE ON/TRACE OFF boundaries, recompiling errors occur.

CA ADS Trace generates trace statements only for code that falls within the TRACE ON and TRACE OFF boundaries. If no TRACE OFF statement is found following a TRACE ON, CA ADS Trace generates trace statements until the end of the source code is reached.

Adding TRACE ON and TRACE OFF Statements

Add the TRACE ON and TRACE OFF statements by using CA IDMS DME You can enter a TRACE ON or TRACE OFF statement anywhere in columns 1 through 72, but it must be wholly contained in one source line and be the only statement in the source line.

CA ADS Trace Comments Commands

When CA ADS Trace encounters a TRACE ON statement, it comments the command as follows:

! >> TRACE ON
During subsequent trace generations, you do not need to uncomment this command. CA ADS Trace recognizes this syntax and turns tracing on at this point.

When CA ADS Trace encounters a TRACE OFF statement, it comments the command as follows:

```!<< TRACE OFF```

Again, you do not need to uncomment this command for subsequent trace generations. CA ADS Trace recognizes this syntax and turns tracing off at this point.

**Only Option (I) is Valid**

CA ADS Trace only processes the TRACE ON and TRACE OFF statements if I is entered in the TRACE ON column. If TRACE ON or TRACE OFF statements are included in the source code and any other option is chosen, the statements are not commented out. If the user then tries to recompile the dialog using ADSC, recompilation errors occur. At this point, the user must either physically remove the TRACE ON and TRACE OFF statements, or select option I next to the appropriate process name on the Build Trace Code screen.

If I is specified as a TRACE ON option, and if no TRACE ON or TRACE OFF statements are found in the source code, CA ADS Trace returns the following message for the first module in error and stops processing:

```ATGT057W OPTION I SPECIFIED UNDER TRACE ON, BUT NO TRACE ON STMNT FOUND```

To correct the situation, either include TRACE ON or TRACE OFF statements in the source code, or choose another option.

**Removing an Internal Trace**

If you want to stop the internal trace, you must remove the TRACE ON and TRACE OFF statements from the process source code.

**Line Limit**

The LINE LIMIT field on the Build Trace Code screen allows control of the number of traced lines to be written to the replay file in the scratch area when the traced dialog is executed.

Valid range: 3000 to 5000 lines

Default value: 3000

A maximum of 5000 traced lines is allowed per dialog. Since the amount of scratch area in CA IDMS is limited, the line limit prevents the scratch area from filling up if a traced dialog gets into a loop.

When the line limit for a dialog is exceeded at execution time, all further tracing on that dialog stops, and a message is displayed after the last line of the replay.
Changing the Line Limit

To change the line limit for a particular dialog, access the Build Trace Code screen, enter a new LINE LIMIT. Then execute the dialog again, using the revised line limit.

As long as the dialog still has any trace statements, you can only increase the line limit, not decrease it. If you remove traces from all of the processes within the dialog, then any value from 3000 to 5000 is again valid.

Limit on Number of Replays

For a specific dialog, 100 replays are allowed. Every time the dialog is executed, the replay of each process traced receives a new replay number. Replays moved back from the queue also receive new numbers.

Deleting a replay or moving a replay to the queue does not change the dialog line availability, nor does it reclaim the space in the scratch area, unless the replay was the only one remaining in the scratch area for that dialog.

Clearing the Scratch Area

After the replay number limit of 100 is reached or the line limit 5000 is reached, to generate more replays, leave CA IDMS or sign off on the System Prompt screen. This action clears the scratch area.

Lines Available

The LINES AVAILABLE field tells how many lines are left in the scratch area for this dialog.

Literals

In addition to exhibiting values, the user can display LITERALS that are not defined as elements in map or work records. The syntax of the LITERAL command is as follows:

LITERAL alphanumeric characters

The limit is 61 alphanumeric characters, including blanks.

If you use a LITERAL statement as the first statement of a dialog, the statement must end with a period.

For example, the command

LITERAL I AM IN SUBROUTINE PUTMAP05
is a valid example of a literal that may be coded in the process. When CA ADS Trace encounters this statement, it comments the command as follows:

!<> LITERAL I AM IN SUBROUTINE PUTMAP05

For subsequent trace generations, you do not need to uncomment this statement. CA ADS Trace recognizes this syntax and adds the code necessary to trace the user-defined literals.

When tracing is no longer desired, remove the LITERAL statement from the source code or choose TRACE OFF option A. Option A directs CA ADS Trace to remove all trace statements, including generated trace statements and EXHIBITS, LITERALS, and TRACE ON and TRACE OFF statements.

**TRACE ALL WITH CONTROL (A)**

The TRACE ALL WITH CTL option is the most powerful of the TRACE ON options. If A is entered in the TRACE ON column, this option directs CA ADS Trace to generate trace statements for all of the commands shown below.

**TRACE ALL NO CONTROL (X)**

The TRACE ALL NO CTL option is similar to the TRACE ALL WITH CTL option except that it does not cause generation of trace statements for control commands. When X is specified, only the Database Commands below cause trace statements to be generated.

**Database Commands**

- CONNECT
- DEFINE SUBROUTINE
- DELETE SCRATCH
- DELETE QUEUE
- DISCONNECT
- ERASE
- EXHIBIT element-name
- FIND
- GET
- GET DETAIL
- GET SCRATCH
- LITERAL alphanumeric characters
- MODIFY
- OBTAIN
- PUT DETAIL
- PUT QUEUE
- PUT SCRATCH
- ROLLBACK
- STORE

**Control Commands 1**

- DISPLAY
- DISPLAY CONTINUE
- EXECUTE NEXT FUNCTION INVOKE
Trace Generated Only if Command is First Word 1

Trace statements are generated for the Database and Control commands shown only if one of the commands is the first word on a given source statement line.

For example, in the statement

```
IF DB-STATUS-OK
   OBTAIN CALC CUSTOMER-RECORD.
```

trace statements are generated for the OBTAIN command because it is the first word on the line.

But in the statement

```
IF DB-STATUS-OK
   THEN OBTAIN CALC CUSTOMER-RECORD.
```

no trace statements are generated because the word THEN precedes the OBTAIN command.

TRACE OFF (A) or (X) Removing a Trace

Use the TRACE OFF option to turn tracing off in dialogs or processes that have had one of the TRACE ON options applied to them. After the trace statements are no longer needed, return to the Build Trace Code screen and enter either A or X in the TRACE OFF column for each process.

TRACE OFF X--CA ADS Trace Statements

Use TRACE OFF option X to remove all CA ADS Trace generated statements for process source.

TRACE OFF A--CA ADS Trace and User Statements

Use TRACE OFF option A to remove all CA ADS Trace generated statements, plus all EXHIBIT and LITERAL commands inserted by the user. This option also removes the internal trace statements TRACE ON and TRACE OFF.

When either A or X is entered in the TRACE OFF column, CA ADS Trace deletes all tracing statements that were placed into the source code; the process code appears as it did before any tracing was done.

When tracing has been turned off, the message TRACE OFF appears next to the appropriate process name. The dialog must then be recompiled.
If future tracing is to be done on the dialog, keep the AT-LINK-RECORD on the ADSC work record screen. If no further tracing is desired, before recompiling, delete the AT-LINK-RECORD by spacing over the character in the WK column on the work record screen.

**ADS Trace Replay**

This section contains an overview of the replay functions of CA ADS Trace and complete descriptions of all options. The replay of a trace can be viewed at a terminal, printed, deleted, or moved to a special queue. It can also be deleted from the queue.

- Conceptual View of Replay Options (see page 44)
- Create Replay from the Queue (see page 47)
- Delete Queue Confirmation (see page 48)
- Delete Replay (see page 48)
- Move Replay (see page 48)
- Print Replay (see page 49)
- Select Replay Screen (see page 50)
- View Replay (see page 51)

**Conceptual View of Replay Options**

After a dialog containing trace code is executed, when you reenter CA ADS Trace, the Main Menu offers two replay options: Select Replay and Create Replay from Queue.

- Select Replay (see page 45)
- Create Replay from Queue (see page 46)
- Screen Descriptions (see page 46)
- Common Fields on Replay Screens (see page 46)

The following figure diagrams these options.
Select Replay

The Select Replay screen lists the replays available, by dialog. There are four choices: View Replay, Move Replay to Queue, Print Replay, and Delete Replay.

The View Replay option presents a replay of the trace on the terminal screen. To find information, you can page up and down, search for a character string, or skip a specified number of lines.
If you anticipate recalling the replay data later, move the replay to a special queue. Before moving the replay to the queue, you can enter a 20-character description to indicate the nature of the trace.

You can also save the replay data for later review by printing a hard copy.

When finished with a specific replay, you can delete it.

Create Replay from Queue

If CA ADS Trace has replays in the queue, you can access the Create Replay from Queue screen by selecting option 3 on the Main Menu.

From the Create Replay from Queue screen, you can delete the replay entirely, or create the replay—that is, move it into the scratch area from the queue so that the dialog name, version number, replay number (newly assigned), and total number of lines are listed on the Select Replay screen. From the Select Replay screen, all of the replay selection options are available.

If you specify delete from queue for a dialog on the Create Replay from Queue screen, a Delete Confirmation screen appears; it offers a chance to cancel the deletion before it is actually carried out.

Screen Descriptions

This section describes all of the options on each replay screen. To make this section easy to use for reference, the screens are presented in alphabetical order.

Common Fields on Replay Screens

Several fields are common to the replay screens. The fields listed here correspond to the fields in the following screen.

**DICTIONARY** -- Name of the dictionary. This field is only for information. To change the dictionary, return to the Main Menu.

**REPLAY NUMBER** -- The number assigned to this replay of the dialog. Every time the dialog is executed with the trace on, the replay of each process receives a new number. If three processes are traced within the dialog, each process is assigned a different number.

Replays moved back from the queue also receive new numbers. The total number of replay numbers that can be assigned for one dialog is 100. To generate more replays after this limit is reached, leave CA IDMS or sign off on the System Prompt screen. This action clears the scratch area, so that you can reenter CA ADS Trace and generate more trace replays.

**DIALOG** -- Name of the dialog. If only the process name was entered when the trace code was built, the dialog name on replay screens is blank.

**VERSION NBR** -- Version number of the dialog.
Create Replay from the Queue

Use the CA ADS Trace, Create Replay From Queue screen to review all dialog replays that have been moved to the queue file. The screen appears when you enter option 3 on the Main Menu screen. When the screen is displayed, the USER ID field is blank, and all replays in the queue are listed. To obtain a list of the replays generated by one user, type in the user ID in the USER ID field and press the ENTER key.

- **Deletion of a Replay from the Queue (see page 47)**

If you enter a C in the OPT (option) column, the replay will be ready for selection from the Select Replay screen. A new replay number is assigned when the replay is created from the queue. You can select only one dialog at a time.

A replay that has been sent to the replay scratch area is deleted from the queue file. Before creating the replay, you may want to compare the number of lines in the replay against the number of lines available listed on the Build Trace Code screen.

If more than one dialog is to be selected, type another C next to the appropriate dialog, and press the ENTER key again.

![Table](#)
If you have not deleted a replay from the queue by the end of the retention period, the replay is automatically deleted at the end of the retention period listed in the RET column. (You can specify the retention period on the Move Replay screen. The default retention period is one day.)

Delete Queue Confirmation

After you have decided to delete a replay from the queue and entered a D on the Create Replay from Queue screen, a confirmation screen is displayed to let you confirm the deletion.

Delete Replay

To access the Delete Replay screen, type D in the OPT (option) column of the Select Replay screen. You can also access the Delete Replay screen by pressing PF12 from the View Replay screen.

Pressing the ENTER key completes the deletion. This deletion does not change the replay numbers of other replays for this dialog.

When PF3 is pressed, the display returns to the Select Replay screen without deleting the replay.

If you delete a replay, you do not reclaim the scratch area space unless the deleted replay was the last replay remaining in the scratch area for the dialog. The scratch area for a dialog only clears when all of the replays for that dialog have been deleted.

Move Replay

To access the Move Replay screen, enter an M in the OPT (option) column, to the left of a dialog name on the Select Replay screen. You can also access the Move Replay screen by pressing PF10 from the View Replay or Print Replay screens.

On the Move Replay screen, the Dictionary name, replay number, dialog name, and version number appear near the top of the screen. These fields are only for information.

The other two fields are for entering variables:
REPLAY DESCRIPTION -- User-supplied description of the replay. Before moving the replay, you can enter a replay description of up to 20 characters. This description is displayed on the Create Replay from Queue screen. The description can provide information to distinguish one replay from another for the same dialog.

QUEUE FILE RETENTION PERIOD -- Number of days the replay is to be retained in the queue file. You can change the queue file retention period by entering an integer from 1 through 9 in this field.

Default value: 1

When these fields have been entered, the Move Replay screen is displayed with a message that the replay has been moved to the queue.

When the replay is moved to the queue, it is deleted from the scratch area. You cannot then choose the replay from the Select Replay screen without first creating it from the queue.

ADST Rnn.nn --- MOVE REPLAY -------------- hh:mm:ss mm/dd/yy
DICTIONARY:
REPLAY NUMBER: 3  DIALOG: ACDPAY01  VERSION NBR: 0001
REPLAY DESCRIPTION:
QUEUE FILE RETENTION PERIOD IN DAYS (1 THRU 9): 1

Print Replay

To access the Print Replay screen, enter a P in the OPT (option) column on the Select Replay screen. You also access the Print Replay screen from the View Replay screen by pressing PF11.

The dictionary name, replay number, dialog name, and version number are displayed near the top of the screen for information.

ADST Rnn.nn --- PRINT REPLAY -------------- hh:mm:ss mm/dd/yy
DICTIONARY: ACCT
REPLAY NUMBER: 3  DIALOG: ACDPAY01  VERSION NBR: 0001
OPTIONS: P=PRINT REPLAY
D=PRINT REPLAY AND DELETE
PRINT OPTION:
PRINTER CLASS (1 THRU 64): 1
PRINTER DESTINATION:
LINES PER PAGE (50 THRU 99): 55

The variable fields are described below.

PRINT OPTION -- Enter a P in this field to print the replay and retain it in the scratch area for further online access.

Enter a D to print the replay and delete it from the list.

The following screen shows an example of a printed replay.

Enter a printer class or a printer destination, but not both.

PRINTER CLASS -- Enter an integer from 1 through 64 to designate the printer class.

Default value: 1
**Select Replay Screen**

The Select Replay screen displays a list of processes for which replays exist. This screen offers four choices:

- **View Replay**
- **Move Replay**
- **Print Replay**
- **Delete Replay.**

To select one of the replay options, enter the one-letter code in the OPT (option) field to the left of the Replay number. In screen a V has been entered for Replay Nbr 1.

When the Select Replay file contains more replays than fit on one screen, use PF keys to move the "window" (your terminal screen) up and down the file.

- **PF5** TOP
- **PF6** BOTTOM
- **PF7** UP
- **PF8** DOWN
If you entered any process names without a dialog name, the DIALOG field for the replay is blank on all replay screens. All such replays are included in the 5000 line limit of the "blank" dialog.

View Replay

### Contents
- Control Command Replay Separators (see page 52)

The View Replay screen is displayed below; it is followed by a description of its fields.

```plaintext
Line number -- The number of the replay line.

Trace Descriptor -- One of the following:
- Name of currently executing program
- EXHIBIT (followed by the element-name)
- VALUE— (followed by the value of the element at this point in dialog execution)
- LITERAL (followed by a user-supplied literal)
- DBACCESS (followed by a database verb or the error status of a preceding verb).

SEARCH -- The Search parameter allows you to scan for a literal string from 1 to 20 characters (including embedded blanks). After entering the string, press PF7 (UP) or PF8 (DOWN). The replay text lines with matching SEARCH characters are highlighted as the first text line on the View Replay screen. To find another occurrence of replay text lines with the same SEARCH characters, press PF7 or PF8 again. While an entry exists in this field, the SKIP value is ignored. To begin scrolling by skip again, delete the characters in the SEARCH field.
```
**SKIP** -- The SKIP parameter allows you to control the number of replay text lines to skip in a forward or backward direction. To skip a specified number of lines, enter the number of lines in the SKIP field and press PF7 (UP) or PF8 (DOWN). The valid skip range is from 1 through 5000, but less than the total number of lines in the replay (see LINE). If the number specified is greater than the number of lines to the top or bottom of the display, the first or last page is displayed.

**Trace Content** -- The content of the trace at that point in execution.

**PF Keys** -- Special PF keys to switch directly to other replay screens.

---

**Control Command Replay Separators**

In order to help the user see more graphically the flow of control of the traced dialog, CA ADS Trace displays separator lines before the control commands. The control commands are traced when A (TRACE ALL--With Control) is specified during trace generation.

Depending on the control command found, one of the following separator lines appears at the point in the dialog where the command is executed:

<table>
<thead>
<tr>
<th>Control Command</th>
<th>Separator Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISPLAY</td>
<td>....ABOUT TO DISPLAY....</td>
</tr>
<tr>
<td>DISPLAY CONTINUE</td>
<td>....ABOUT TO DISPLAY CONTINUE....</td>
</tr>
<tr>
<td>EXECUTE NEXT FUNCTION</td>
<td>....ABOUT TO EXECUTE NEXT FUNCTION....</td>
</tr>
<tr>
<td>INVOKE</td>
<td>....ABOUT TO INVOKE DIALOG....</td>
</tr>
<tr>
<td>LEAVE</td>
<td>....ABOUT TO LEAVE....</td>
</tr>
<tr>
<td>LINK</td>
<td>....ABOUT TO LINK....</td>
</tr>
<tr>
<td>RETURN</td>
<td>....ABOUT TO RETURN....</td>
</tr>
<tr>
<td>TRANSFER</td>
<td>....ABOUT TO TRANSFER TO DIALOG....</td>
</tr>
</tbody>
</table>

CA ADS Trace displays the above information only when the control command is the first word on a given source line text.

If the process has only one line of code, the separator line is not displayed.

---

**ADST** Rnn.nn --- VIEW REPLAY -------------------- hh:mm:ss mm/dd/yy
**DICTIONARY: ACQ1**
**LINE: 61**
**OF: 66**
**ATRP007I END OF ADS/O TRACE DATA**
**REPLAY NUMBER: 1** DIALOG: ATDSTA01 VERSION NBR: 0001
**SKIP: SEARCH:**
**61** DBACCESS ERROR-STATUS = 0000
**62** ATDSTA01 DEFINE SUBROUTINE GETPAGE.
**63** DBACCESS GET SCRATCH AREA ID MODPAGES KEEP INTO
**64** DBACCESS ATMP001-STA FIRST.
**65** DBACCESS ERROR-STATUS = 0000
**66** . . . . . . . . . . . . . ABOUT TO DISPLAY . . . . . . . . . .

PF10=MOVE REPLAY PR11=PRINT REPLAY PF12=DELETE REPLAY