

CA-IDMS[®]

ADS Trace User Guide
15.0



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How to Use This Manual

Purpose

This guide provides the information needed to run CA-IDMS/ADS Trace. In addition, the many features that CA-IDMS/ADS Trace offers are documented to assist you.

Organization

Chapter	Description
1	Presents a summary of the capabilities of CA-IDMS/ADS Trace.
2	Describes a typical CA-IDMS/ADS Trace session. After an overview, the procedure is presented in the order in which a user might proceed in a typical session.
3	Presents the details of all options for generating a trace, reviewing trace status, and removing the trace. After the overview, the trace options and other fields on the Build Trace Code screen are presented in alphabetical order for easy reference.
4	Presents an overview of all details in replaying a trace, moving the replay to a queue, printing it, or deleting it. After the overview, the screens are presented in alphabetical order for easy reference.
5	Provides system requirements, storage requirements, and operational considerations that help ensure smooth operation of CA-IDMS/ADS Trace.
6	Lists all informative, warning, and error messages along with reasons for occurrence and suggested actions to be taken.
Index	Provides an alphabetical list of CA-IDMS/ADS Trace concepts with their locations in the user guide.

CA-IDMS/ADS Trace Publications

In addition to this guide, Computer Associates supplies the following documentation.

Name	Contents
CA-IDMS installation guides	An installation guide is provided to use as a reference tool and gives complete information about the installation of the products.

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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-IDMS/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-IDMS/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.

1.1 Online Trace for CA-ADS Dialogs

During execution of a CA-ADS dialog, CA-IDMS/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.

1.1.1 Building the Trace

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

1.1.2 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-IDMS/ADS Trace preserves the sequence in the replay, without any rollback.

CA-IDMS/ADS Trace traces not only the specified dialog, but also all subroutines through which dialog control passes. While the dialog is executing, CA-IDMS/ADS Trace captures and highlights information about 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.

1.2 Environment

CA-IDMS/ADS Trace operates under CA-IDMS release 15.0 and CA-ADS release 15.0. It provides full-screen display on all IBM 3270-type terminals (models 2 through 5).

1.3 Flexibility

CA-IDMS/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.

1.3.1 Easy Selection of Options

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

1.3.2 Trace Options

When specifying trace options, you can:

- **Direct CA-IDMS/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-IDMS/ADS Trace to display the execution-time contents** of any exhibited dialog work records, database fields, or map variables.
- **Direct CA-IDMS/ADS Trace to display user-supplied literal statements** so that specific events in the trace replay will be highlighted.
- **Direct CA-IDMS/ADS Trace 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.

1.3.3 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.

1.3.4 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.

1.4 Typical Session

In a typical CA-IDMS/ADS Trace 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-IDMS/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-IDMS/ADS Trace by using CA-IDMS/Dictionary Module Editor (CA-IDMS/DME).

When CA-IDMS/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-IDMS/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-IDMS/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. Figure 1.1 shows a typical CA-IDMS/ADS Trace session.

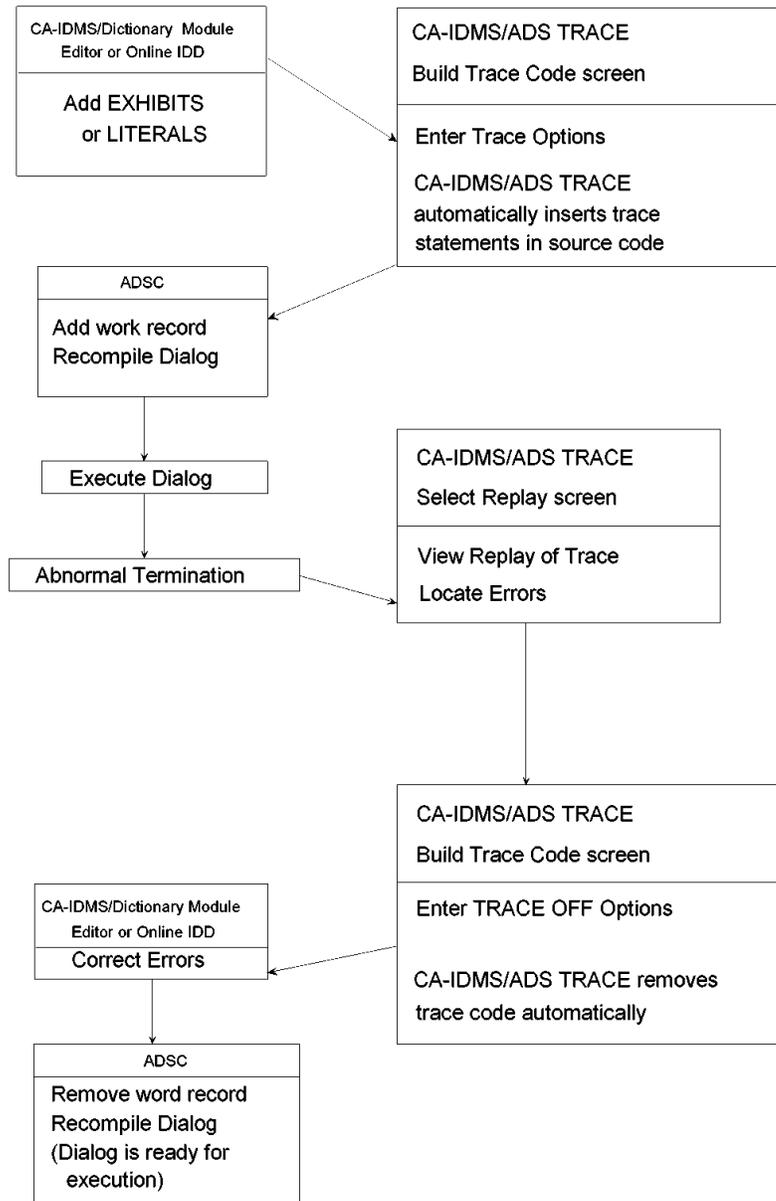


Figure 1.1: Typical CA-IDMS/ADS Trace Session

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This chapter presents an overview of the CA-IDMS/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.

2.1 Conceptual View of CA-IDMS/ADS Trace

CA-IDMS/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 diagram in Figure 2.1 outlines these functions.

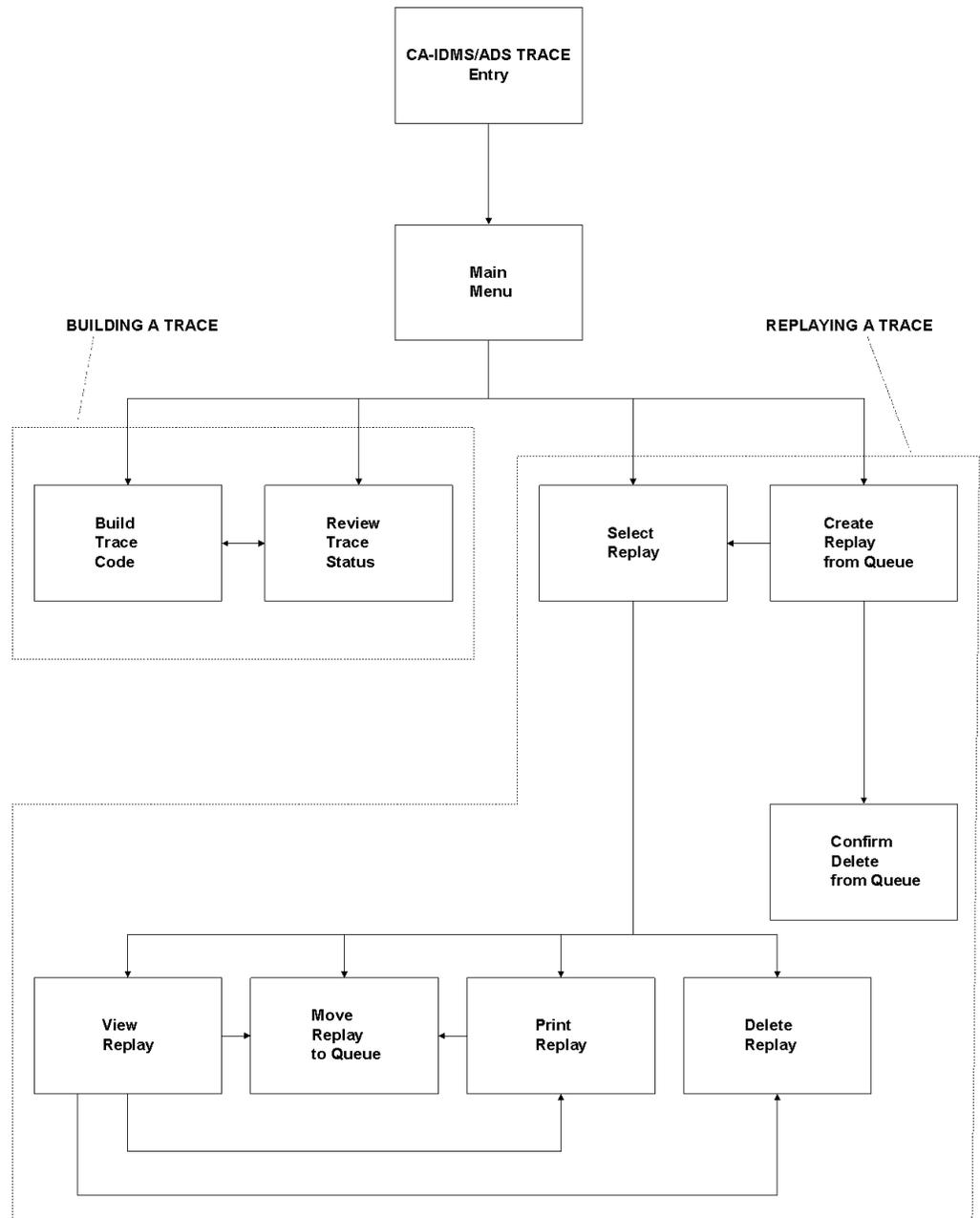


Figure 2.1: Conceptual View of CA-IDMS/ADS Trace Screens

2.1.1 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.

2.1.2 Recompiling and Executing a Dialog

After the trace statements are in place in the process source code, leave CA-IDMS/ADS Trace and enter 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-IDMS/ADS Trace.

2.1.3 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.

2.1.4 Removing the Trace

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

2.2 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 Figure 2.2 and diagrammed in Figure 2.3.

Key	Meaning	Function
CLEAR	EXIT	Exit to CA-IDMS.
PF1 or PF13	Review Status	Jump to Review Trace Status from Build Trace Code screen.
PF2 or PF14	Build Code	Jump to Build trace code screen from Review Trace Status screen.
PF3 or PF15	END	Exit to the next higher level. Select Replay from Delete Replay, Print Replay, Move Replay, or View Replay. To Create Replay from Confirm Delete.
PF4 or PF16	RETURN	Return to the CA-IDMS/ADS Trace Main Menu.
PF5 or PF17	TOP	In a series of screens, go to the first page of the current display.
PF6 or PF18	BOTTOM	In a series of screens, go to the last page of the current display.
PF7 or PF19	UP	Move the “window” one page toward the first page of the current display. CA-IDMS/ADS Trace replay screens indicate the current page and the number of pages in the series. Also used with SKIP and SEARCH commands.
PF8 or PF20	DOWN	Move the “window” one page toward the last page of current display. CA-IDMS/ADS Trace replay screens indicate the current page and the number of pages in the series. Also used with SKIP and SEARCH commands.
PF9 or PF21	Select Replay	Jump to Select Replay from Create Replay.
PF10 or PF22	Move Replay	Jump to Move Replay from View Replay or from Print Replay.
PF11 or PF23	Print Replay	Jump to Print Replay from View Replay.
PF12 or PF24	Delete Replay	Jump to Delete Replay from View Replay.

Figure 2.2: Program Functions

2.2 Program Function Keys

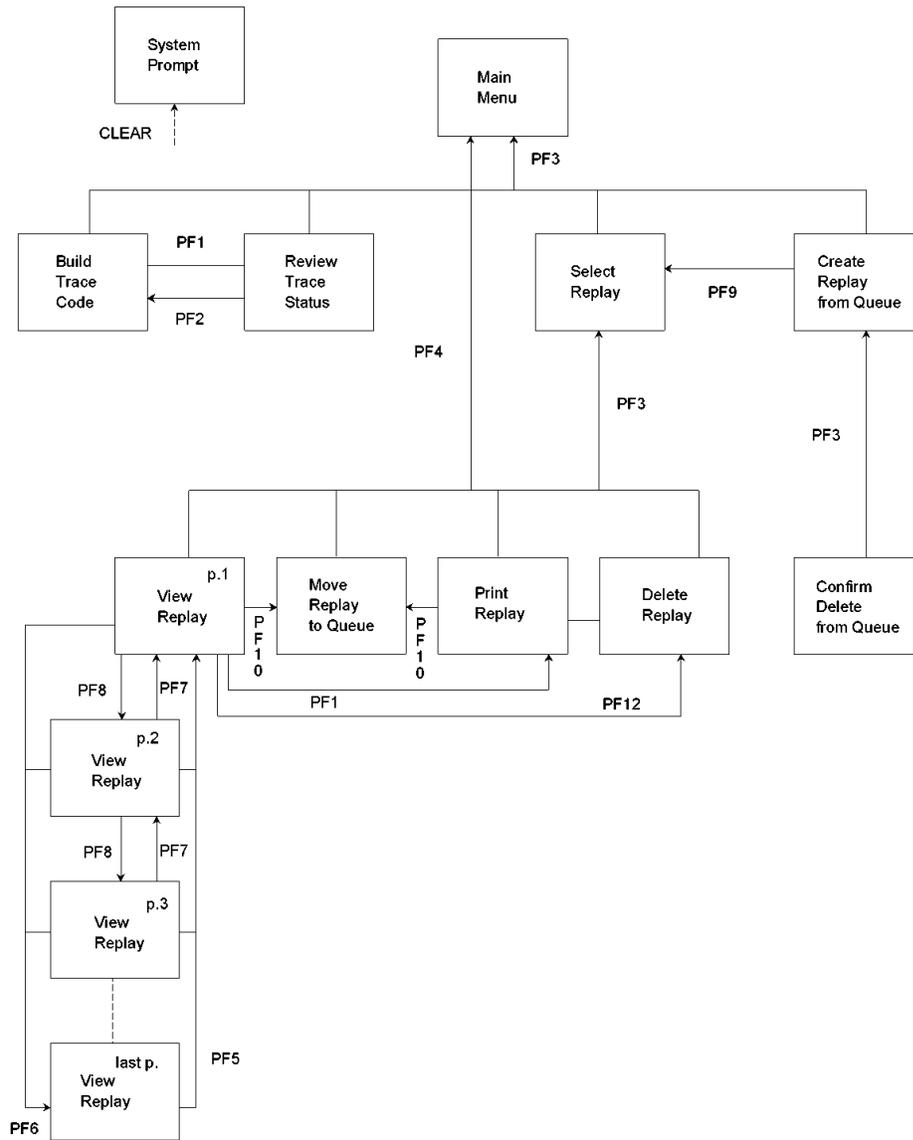


Figure 2.3: Program Functions Key Diagram

2.3 CA-IDMS/ADS Trace Access

2.3.1 Entry Screen

After the task code ADST is entered on the CA-IDMS System Prompt screen, CA-IDMS/ADS Trace displays the CA-IDMS/ADS Trace Entry screen. Figure 2.4 shows an Entry screen. To proceed to the Main Menu, press the ENTER key.

```

          CCCCCCCC
          CCCCCCCC
          CCC
          CCC      AAAA
          CCC      AAAAA
          CCC      AAAAA
          CCC      AAA AAA
          CCC AAA  AAA
          CCAAACCCCC
          AAACCCCCC
          AAA      AAA
          AAA      AAA
          AAA      AAA
          CA-IDMS/ADS TRACE

          PRESS ENTER TO RECEIVE MAIN MENU

          Rnn.nn  COPYRIGHT 1986, 2000  COMPUTER ASSOCIATES  ALL RIGHTS RESERVED

```

Figure 2.4: Screen Header

2.3.2 Common Fields on Functional Screens

Several fields are common to all functional screens in CA-IDMS/ADS Trace. Here are descriptions of the fields designated by numbers in Figure 2.5.

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-IDMS/ADS Trace messages appear in the third line of the screen. Complete explanations of all messages are in Chapter 6, “Messages.”

```

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

```

Figure 2.5: Entry Screen

2.3.3 Main Menu

Figure 2.6 shows the Main Menu. Here are descriptions of the fields.

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-IDMS/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

```

Figure 2.6: Main Menu

2.4 Trace Generation

A typical sequence of events for trace generation is described on this page. 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 Chapter 3, “Trace Generation.”

2.4.1 Adding EXHIBIT and LITERAL Statements

Before entering CA-IDMS/ADS Trace, the user adds LITERAL and EXHIBIT statements at appropriate places in the source code of a specific process. CA-IDMS IDD ONLINE can be used for this task. Also, if you have installed the product, CA-IDMS/Dictionary Module Editor (CA-IDMS/DME) is an efficient tool for entering the statements.

2.4.2 Building Trace Code

Next, from the CA-IDMS/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-IDMS/ADS Trace then redisplayes 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-IDMS/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.

2.4.3 Adding Work Record, Regenerating Dialog, Executing Dialog

The user then leaves CA-IDMS/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.

2.4.4 Viewing the Replay

After the dialog has either executed successfully or terminated abnormally, the user signs back on to CA-IDMS/ADS Trace to view the replay. A typical replay sequence is described later in 2.5.1, “Typical Sequence.”

2.4.5 Building Trace Code

Figure 2.7 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 Figure 2.7 the user has entered a dialog module named ACDPAY01. After the dialog name is entered, CA-IDMS/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. Figure 2.8 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.

ADST		Rnn.nn	BUILD TRACE CODE		hh:mm:ss mm/dd/yy	
DICTIONARY: ACCT					PAGE: 1 OF: 1	
DIALOG	TRACE			I		
NAME	ON OFF	PROCESS NAME	VER	N	MESSAGE	
ACDPAY01						
VER 0001						
—TRACE ON OPTIONS--						
A=TRACE ALL WITH CTL			REPLAY LINES LIMIT:		3000	
X=TRACE ALL NO CTL			LINES AVAILABLE:		3000	
D=DEFINE SUBRTN ONLY			GENERATE WAIT INTERVAL:		75	
E=EXHIBITS ONLY						
V=DB VERBS ONLY						
I=INTERNAL TRACE						
			PF1=REVIEW TRACE STATUS			

Figure 2.7: Build Trace Code Screen, Entering a Dialog Name

ADST		Rnn.nn	BUILD TRACE CODE		hh:mm:ss mm/dd/yy
DICTIONARY: ACCT					PAGE: 1 OF: 1
DIALOG NAME	TRACE ON OFF	PROCESS NAME	VER	I N	MESSAGE
ACDPAY01	A	ACDPAY01-PM-GET-DATE			TRACE OFF
VER 0001	X	ACDPAY01-RP-PF15-EXIT			TRACE OFF
	D	ACDPAY01-RP-PF3-END			TRACE OFF
	A	ACDPAY01-RP-PF7-UP			TRACE ON
	E	ACDPAY01-RP-PF8-DOWN			TRACE OFF
---TRACE ON OPTIONS---					
A=TRACE ALL WITH CTL		REPLAY LINES LIMIT:		3000	
X=TRACE ALL NO CTL		LINES AVAILABLE:		2895	
D=DEFINE SUBRTN ONLY		GENERATE WAIT INTERVAL:		75	
E=EXHIBITS ONLY					
V=DB VERBS ONLY					
I=INTERNAL TRACE					
PF1=REVIEW TRACE STATUS					

Figure 2.8: Build Trace Code Screen, Selecting TRACE ON Options

2.4.6 Confirmation

Figure 2.9 shows the Build Trace Code screen after CA-IDMS/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.

DIALOG TRACE		PROCESS NAME	VER	N	MESSAGE
ACDPAY01		ACDPAY01-PM-GET-DATE			TRACE ON
VER 0001		ACDPAY01-RP-PF15-EXIT			TRACE ON
		ACDPAY01-RP-PF3-END			SUBRTN TRACE ON
		ACDPAY01-RP-PF7-UP			TRACE OFF
		ACDPAY01-RP-PF8-DOWN			TRACE ON
—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					
			REPLAY LINES LIMIT:	3000	
			LINES AVAILABLE:	3000	
			GENERATE WAIT INTERVAL:	75	
PF1=REVIEW TRACE STATUS					

Figure 2.9: Build Trace Code Screen, Confirmation User Request

2.4.7 Adding Work Record, Recompiling Dialog

The user presses the CLEAR key to exit the CA-IDMS/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.

2.4.8 Executing the Dialog

After the dialog is recompiled, it is executed.

2.4.9 Reviewing Trace Status

The Review Trace Status screen lists dialogs that have been recompiled. Figure 2.10 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-IDMS/ADS Trace automatically enters the name and version of the dialog.

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	DATE	TIME	
				MMDDYY	HHMM	
ACDPAY01-PM-GET-DATE	0001	TRACE ON	TPC12251	mmddy	hhmm	
ACDPAY01-RP-PF15-EXIT	0001	TRACE ON	TPC12251	mmddy	hhmm	
ACDPAY01-RP-PF3-END	0001	SUBRTN TRACE ON	TPC12251	mmddy	hhmm	
ACDPAY01-RP-PF8-DOWN	0001	TRACE ON	TPC12251	mmddy	hhmm	

PF2=BUILD TRACE CODE

Figure 2.10: Review Trace Status Screen

2.5 Trace Replay

2.5.1 Typical Sequence

The following pages more fully describe a typical sequence of events in a trace replay. This sequence is a sample sequence. Chapter 4, “Trace Reply” gives complete details of every replay option.

2.5.2 Selecting a Replay

From the Main Menu, the user enters option **2** to select the Select Replay screen. On the Select Replay screen, CA-IDMS/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-IDMS/ADS Trace has added information lines. The replay also shows the values of exhibits and any literals entered by the user.

2.5.3 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-IDMS/ADS Trace by pressing the CLEAR key.

2.5.4 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-IDMS/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.

2.5.5 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-IDMS/ADS Trace removes all trace code created by CA-IDMS/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.

2.5.6 Correcting an Error

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

2.5.7 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.

2.5.8 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 in Figure 2.11, the user placed a **V** in the OPT (option) column to view the replay at the terminal.

OPT	REPLAY NBR	DIALOG	VERSION NBR	NBR OF LINES	DATE	TIME
V	1	ACDPAY01	0001	0250	mm/dd/yy	hh:mm
	2	ACDPAY01	0001	0043	mm/dd/yy	hh:mm
	3	ACDPAY01	0001	0125	mm/dd/yy	hh:mm

Figure 2.11: Select Replay Screen

2.5.9 Common Fields on Replay Screens

Several fields are common to the replay screens. The fields listed here correspond to the fields in Figure 2.12.

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.

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

Figure 2.12: Common Fields on Replay Screens

2.5.10 Viewing the Replay

Figure 2.13 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.

6 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

```

Figure 2.13: View Replay Screen

2.5.11 Printing the Replay

Figure 2.14 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:
  PRINTER CLASS (1 THRU 64): 1
  PRINTER DESTINATION:
  LINES PER PAGE (50 THRU 99): 55

```

Figure 2.14: Print Replay Screen

2.5.12 Moving the Replay to a Queue

The field descriptions listed below correspond to the fields on the Move Replay screen shown in Figure 2.15.

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-IDMS/ADS Trace and selects option 3, Create Replay from Queue.

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

Figure 2.15: Move Replay Screen

2.5.13 Creating a Replay from the Queue

Figure 2.16 shows the CA-IDMS/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 (see Figure 2.16). The **C** instructs CA-IDMS/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.

```

ADST          Rnn.nn  —  CREATE REPLAY FROM QUEUE  ——— hh:mm:ss mm/dd/yy
DICTIONARY: ACCT                                PAGE:  1 OF:  1
OPTIONS: C=CREATE REPLAY      DISPLAY QUEUE FOR USER ID: TPC12251
          D=DELETE FROM QUEUE
OPT  NBR  DIALOG  #LINES  USER ID  DATE  TIME  RET  DESCRIPTION
-----
C    1    ACDPAY01   105   TPC12251 mm/dd/yy hh:mm  1  TRACE DSUBS FOR PR1
    2    ACDPAY01    50   TPC12251 mm/dd/yy hh:mm  1  EXHIBITS FOR PR1
    3    ACDPAY01   280   TPC12251 mm/dd/yy hh:mm  1  CORRECTED

          PF9=SELECT REPLAY

```

Figure 2.16: Create Replay from Queue Screen

2.5.14 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 (see Figure 2.17).

```

ADST          Rnn.nn  —  DELETE REPLAY  ——— hh:mm:ss mm/dd/yy
DICTIONARY: ACCT
REPLAY NUMBER: 3  DIALOG: ACDPAY02  VERSION NBR: 0001

          PRESS ENTER TO DELETE REPLAY
          OR
          PRESS PF3 TO CANCEL DELETE

```

Figure 2.17: Delete Replay Screen

2.5.15 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.

2.5.16 Removing Trace Code

To remove trace statements, reenter CA-IDMS/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**, CA-IDMS/ADS Trace removes all of the trace code, including EXHIBIT and LITERAL statements entered by the user, and then displays a TRACE OFF message next to the process name. See Figure 2.18 for an example of the Build Trace Code screen with TRACE OFF options entered.

If you enter an **X** in the TRACE OFF column, CA-IDMS/ADS Trace removes all of the generated trace code, but leaves the exhibits and literals. The only valid characters in the TRACE OFF column are **A** and **X**.

ADST		Rnn.nn	BUILD TRACE CODE		hh:mm:ss mm/dd/yy
DICTIONARY: ACCT					PAGE: 1 OF: 1
DIALOG	TRACE			I	
NAME	ON OFF	PROCESS NAME	VER	N	MESSAGE
ACDPAY01	A	ACDPAY01-PM-GET-DATE			TRACE ON
VER 0001	A	ACDPAY01-RP-PF15-EXIT			TRACE ON
	A	ACDPAY01-RP-PF3-END			TRACE ON
	X	ACDPAY01-RP-PF7-UP			TRACE ON
--TRACE ON OPTIONS--					
A=TRACE ALL WITH CTL			REPLAY LINES LIMIT: 3000		
X=TRACE ALL NO CTL			LINES AVAILABLE: 2637		
D=DEFINE SUBRTN ONLY			GENERATE WAIT INTERVAL: 75		
E=EXHIBITS ONLY					
V=DB VERBS ONLY					
I=INTERNAL TRACE					
			PF1=REVIEW TRACE STATUS		

Figure 2.18: Build Trace Code Screen, Showing TRACE OFF

2.5.17 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-IDMS/ADS Trace and modifying the source code with CA-IDMS/DME or CA-IDMS IDD ONLINE.

2.5.18 Removing Work Record

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

2.5.19 Recompiling Dialog

Recompile the dialog.

Chapter 3. Trace Generation

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This chapter 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.

The diagram in Figure 3.1 illustrates the procedure for trace generation.

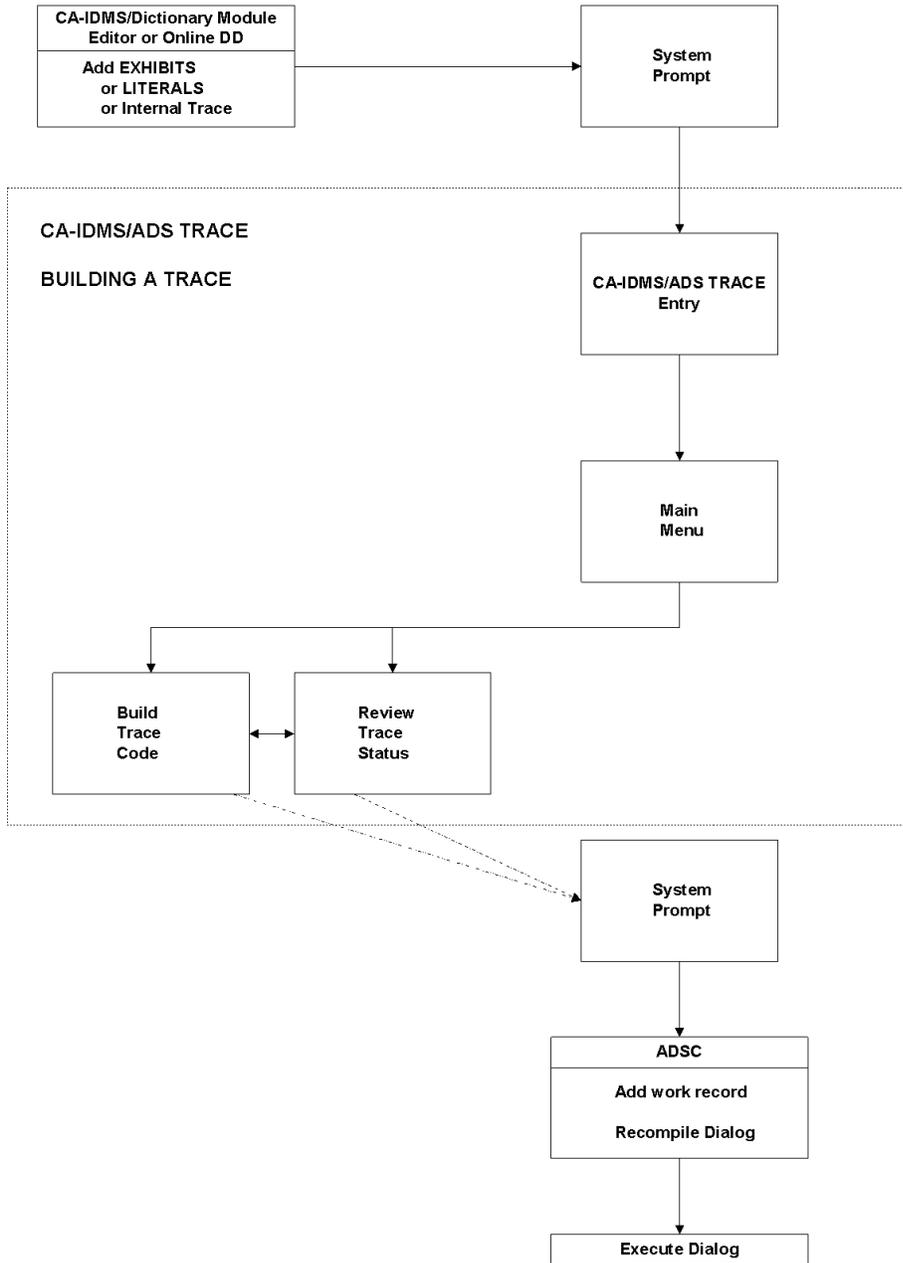


Exhibit 3.1: Trace Generation Procedure

3.1 Add Exhibits and Literals

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

3.2 Access CA-IDMS/ADS Trace

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

3.3 Build Trace Code

The Build Trace Code screen lists several options. After the options have been entered for the processes to be traced, CA-IDMS/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.

3.4 Add Work Record, Recompile and Execute Dialog

After the trace statements have been added to the process source code, you must specify, on the ADSC Work Record screen, the CA-IDMS/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-IDMS/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.

Chapter 4, “Trace Reply” describes replay alternatives.

3.5 Review Trace Status of Dialogs

To see which dialogs currently contain trace statements, select Review Trace Status, option 4, from the Main Menu. Exhibit 3.2 shows a Review Trace Status screen.

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	DATE	TIME	
				MMDDYY	HHMM	
ACDPAY01-PM-GET-DATE	0001	TRACE ON	TPC12251	mmddy	hhmm	
ACDPAY01-RP-PF15-EXIT	0001	TRACE ON	TPC12251	mmddy	hhmm	
ACDPAY01-PR-PF3-END	0001	SUBRTN TRACE ON	TPC12251	mmddy	hhmm	
ACDPAY01-PR-PF8-DOWN	0001	TRACE ON	TPC12251	mmddy	hhmm	
PF2=BUILD TRACE CODE						

Exhibit 3.2: Reviewing Trace Status

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-IDMS/ADS Trace automatically lists the dialog name and version on the Build Trace Code screen.

3.6 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.

3.7 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-IDMS/ADS Trace removes the old trace and applies the new one.

3.8 Specifying Trace Options

Use the Build Trace Code screen, shown in Figure 3.3, 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			I		
NAME	ON OFF	PROCESS NAME	VER	N	MESSAGE	
ACDPAY01	A					
VER 0001						
---TRACE ON OPTIONS---						
A=TRACE ALL WITH CTL			REPLAY LINES LIMIT:		3000	
X=TRACE ALL NO CTL			LINES AVAILABLE:		3000	
D=DEFINE SUBRTN ONLY			GENERATE WAIT INTERVAL:		75	
E=EXHIBITS ONLY						
V=DB VERBS ONLY						
I=INTERNAL TRACE						
			PF1=REVIEW TRACE STATUS			

Exhibit 3.3: Building Trace Code, Tracing an Entire Dialog

3.9 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.

3.10 Trace Processes within a Dialog

If you key in only a dialog name and then press the ENTER key, CA-IDMS/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. See Figure 3.4.

ADST		Rnn.nn	BUILD TRACE CODE		hh:mm:ss mm/dd/yy
DICTIONARY: ACCT					PAGE: 1 OF: 1
DIALOG	TRACE			I	
NAME	ON OFF	PROCESS NAME	VER	N	MESSAGE
ACDPAY01	A	ACDPAY01-PM-GET-DATE			TRACE OFF
VER 0001	X	ACDPAY01-RP-PF15-EXIT			TRACE OFF
	D	ACDPAY01-RP-PF3-END			TRACE OFF
	A	ACDPAY01-RP-PF7-UP			TRACE ON
	E	ACDPAY01-RP-PF8-DOWN			TRACE OFF
--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					
REPLAY LINES LIMIT: 3000					
LINES AVAILABLE: 3000					
GENERATE WAIT INTERVAL: 75					
PF1=REVIEW TRACE STATUS					

Exhibit 3.4: Building Trace Code, Processes within a Dialog

3.11 Trace Included Modules

CA-IDMS/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 3.24, “INCLUDE (IN).”

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.

3.12 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-IDMS/ADS Trace accumulates trace statistics that are transparent to the application developer. When the dialog has been executed, the CA-IDMS/ADS Trace replay facility is ready to playback the dialog's execution path.

3.13 Changing 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-IDMS/ADS Trace removes any unnecessary trace statements before inserting the new statements.

ADST	Rnn.nn	BUILD TRACE CODE	hh:mm:ss	mm/dd/yy
DICTIONARY: ACCT			PAGE: 1	OF: 1
DIALOG	TRACE	PROCESS NAME	VER	I
NAME	ON OFF			N
ACDPAY01	A	ACDPAY01-PM-GET-DATE		
VER 0001	X	ACDPAY01-RP-PF15-EXIT		
	D	ACDPAY01-RP-PF3-END		
	A	ACDPAY01-RP-PF7-UP		
	E	ACDPAY01-RP-PF8-DOWN		
—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				
			REPLAY LINES LIMIT:	3000
			LINES AVAILABLE:	3000
			GENERATE WAIT INTERVAL:	75
			PF1=REVIEW TRACE STATUS	

Exhibit 3.5: Building Trace Code, Process Names without Dialog Name

3.14 Trace Selection Tables

Exhibit 3.6 and exhibit 3.7 show tables of selections available on the Build Trace Code screen, with brief descriptions of each alternative. The rest of this chapter gives complete information on each of these alternatives. They are presented in alphabetical order.

3.15 Trace On Selections

Selection		Description
A	TRACE ALL WITH CTL	Trace all control commands, DEFINE SUBROUTINE statements, exhibits, literals, and database commands.
X	TRACE ALL NO CTL	Trace all of the above except control commands.
D	DEFINE SUBRTN ONLY	Trace only DEFINE SUBROUTINE commands.
E	EXHIBITS ONLY	Trace only the exhibit statements and display the values of the elements exhibited.
V	DB VERBS ONLY	Trace only the database verbs and display the error status of each verb.
I	INTERNAL TRACE	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.
	LINE LIMIT	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.
	LINES AVAILABLE	Lists the number of lines remaining in the scratch area for this dialog.
	GENERATE WAIT INTERVAL	Allows control of the number of times the interrupt routine is called during module trace generation. 1 to 500. Default: 75.

Exhibit 3.6: Trace On Selection Table

3.16 Trace Off Selections

	Selection	Description
A	TRACE OFF ALL	Entered in the TRACE OFF column, removes all CA-IDMS/ADS Trace generated statements and all EXHIBIT and LITERAL statements. Regenerate the dialog.
X	TRACE OFF GENERATED STATEMENTS	Entered in the TRACE OFF column, removes CA-IDMS/ADS Trace generated statements. Recompile the dialog.
IN	INCLUDE	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.

Exhibit 3.7: Trace Off Selection Table

3.17 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.

3.18 DATABASE VERBS ONLY (V)

Use the DATABASE VERBS ONLY option to trace for only database verbs (and other commands listed below). The CA-IDMS/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-IDMS/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.

3.19 DEFINE SUBRTN ONLY (D)

Use the DEFINE SUBRTN ONLY option to trace only DEFINE SUBROUTINE statements. The CA-IDMS/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.

3.20 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-IDMS/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-IDMS/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-IDMS/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-IDMS/ADS Trace replay shows this value as 101.00. Numeric elements which have no decimal points show the actual value.

3.21 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-IDMS/ADS Trace to remove all trace statements, including EXHIBITS and LITERALS.

3.22 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.

3.23 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-IDMS/ADS Trace issues a HICCUP WAIT to remind CA-IDMS that CA-IDMS/ADS Trace is still executing. This reminder prevents a runaway task abnormal termination from occurring during CA-IDMS/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-IDMS/ADS Trace does not record the MOVE and COMPUTE statements, the operating system needs a reminder that CA-IDMS/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-IDMS/ADS Trace generate wait interval should be used.

3.24 INCLUDE (IN)

CA-IDMS/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-IDMS/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.

3.25 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.

3.26 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.

3.27 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-IDMS/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-IDMS/ADS Trace generates trace statements until the end of the source code is reached.

3.28 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.

3.29 CA-IDMS/ADS Trace Comments Commands

When CA-IDMS/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-IDMS/ADS Trace recognizes this syntax and turns tracing on at this point.

When CA-IDMS/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-IDMS/ADS Trace recognizes this syntax and turns tracing off at this point.

3.30 Only Option (I) is Valid

CA-IDMS/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-IDMS/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 STMT FOUND
```

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

3.31 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.

3.32 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.

3.33 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.

3.34 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.

3.35 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.

3.36 Lines Available

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

3.37 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-IDMS/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-IDMS/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-IDMS/ADS Trace to remove all trace statements, including generated trace statements and EXHIBITS, LITERALS, and TRACE ON and TRACE OFF statements.

3.38 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-IDMS/ADS Trace to generate trace statements for all of the commands shown below.

3.39 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.

3.40 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

3.41 Control Commands

DISPLAY
DISPLAY CONTINUE
EXECUTE NEXT FUNCTIONINVOKE
LEAVE
LINK
RETURN
TRANSFER

3.42 Trace Generated Only if Command is First Word

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.

3.43 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.

3.44 TRACE OFF X--CA-IDMS/ADS Trace Statements

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

3.45 TRACE OFF A--CA-IDMS/ADS Trace and User Statements

Use TRACE OFF option **A** to remove all CA-IDMS/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-IDMS/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.

Chapter 4. Trace Reply

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This chapter contains an overview of the replay functions of CA-IDMS/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.

4.1 Conceptual View of Replay Options

After a dialog containing trace code has been executed, when you reenter CA-IDMS/ADS Trace, the Main Menu offers two replay options: Select Replay and Create Replay from Queue. Figure 4.1 diagrams these options.

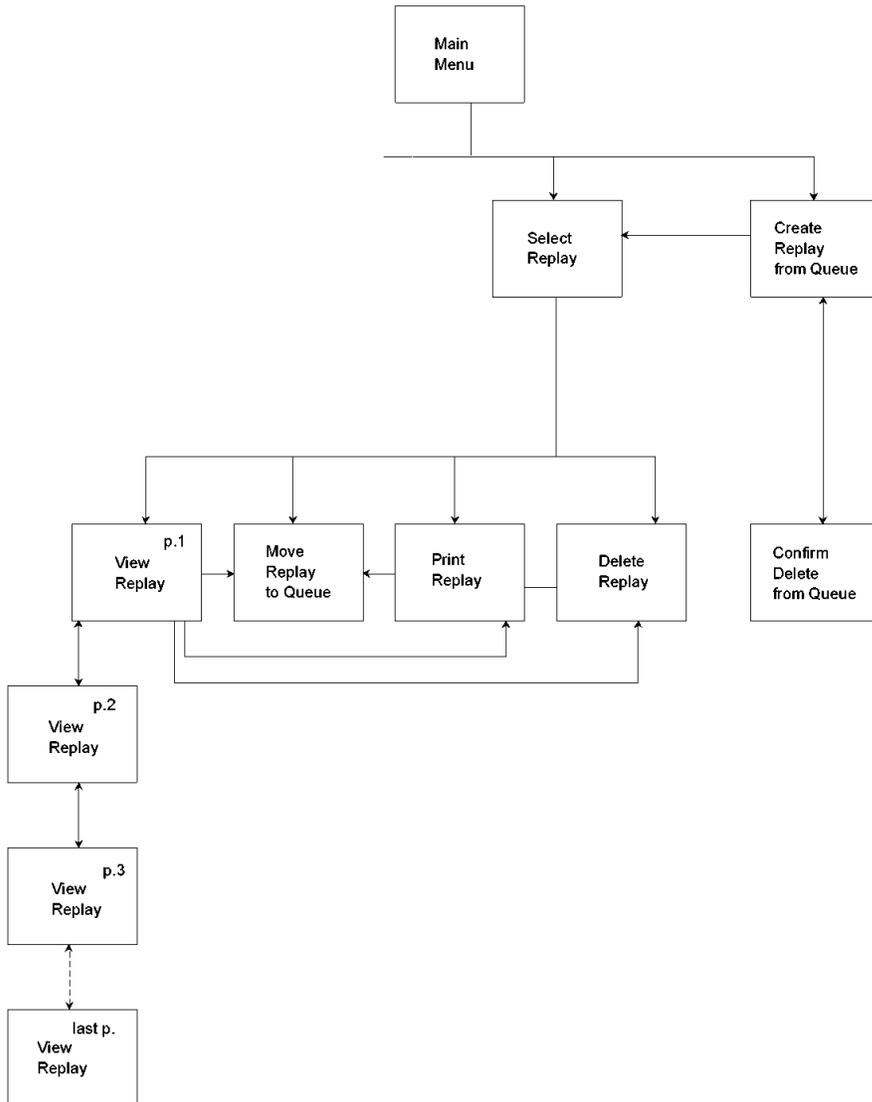


Figure 4.1: Conceptual View of Replay Options

4.1.1 Select Replay

The Select Replay screen lists the replays available, by dialog. There are four choices: View Replay, Move Replay, 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.

4.1.2 Create Replay from Queue

If CA-IDMS/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.

4.1.3 Screen Descriptions

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

4.1.4 Common Fields on Replay Screens

Several fields are common to the replay screens. The fields listed here correspond to the fields in Figure 4.2.

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-IDMS/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.

```
ADST          Rnn.nn  --- MOVE  REPLAY  ----- hh:mm:ss mm/dd/yy
DICTIONARY: ACCT

REPLAY NUMBER: 3      DIALOG: ACDPAY01    VERSION NBR: 0001
REPLAY DESCRIPTION:
QUEUE FILE RETENTION PERIOD IN DAYS (1 THRU 9): 1
```

Figure 4.2: Common Fields on Replay Screens

4.2 Create Replay From Queue

Use the CA-IDMS/ADS Trace Create Replay From Queue screen, shown in Figure 4.3, 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.

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.

```

ADST          Rnn.nn -- CREATE REPLAY FROM QUEUE ----- hh:mm:ss
mm/dd/yy
DICTIONARY: ACCT                                PAGE: 1 OF: 1
OPTIONS: C=CREATE REPLAY      DISPLAY QUEUE FOR USER ID: TPC12251
          D=DELETE FROM QUEUE
OPT  NBR  DIALOG  #LINES  USER ID  DATE  TIME  RET  DESCRIPTION
-----
      1  ACDPAY01   105  TPC12251 mm/dd/yy hh:mm  1  TRACE DSUBS FOR PR1
      C  2  ACDPAY01    50  TPC12251 mm/dd/yy hh:mm  1  EXHIBITS FOR PR1
      3  ACDPAY01   280  TPC12251 mm/dd/yy hh:mm  1  CORRECTED

          PF9=SELECT REPLAY

```

Figure 4.3: Create Replay from Queue Screen

When the queue 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

```

4.2.1 Deletion of a Replay from the Queue

To delete a replay from the queue file, enter a **D** in the OPT (option) column next to the replay number. That version of the replay will be deleted. The other replays do not change their replay numbers. When **D** is entered for a replay, another screen is displayed to let you confirm the deletion.

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.)

4.3 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.

Figure 4.4 shows a Delete Queue Confirmation screen.

```
ADST          Rnn.nn --- DELETE QUEUE CONFIRMATION ---- hh:mm:ss
mm/dd/yy
DICTIONARY: ACCT
REPLAY NUMBER: 2   DIALOG: ACDPAY01   VERSION NBR: 0001
NUMBER OF LINES: 105 USER ID: TPC12251 DESCRIPTION: EXHIBITS
DATE:          mm/dd/yy TIME:      hh:mm   RETENTION: 1
                PRESS ENTER TO DELETE QUEUE
                OR
                PRESS PF3 TO CANCEL DELETE
```

Figure 4.4: Delete Queue Confirmation Screen

4.4 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, shown in Figure 4.5, 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.

```
ADST          Rnn.nn --- DELETE REPLAY ----- hh:mm:ss mm/dd/yy
DICTIONARY: ACCT
REPLAY NUMBER: 3   DIALOG: ACDPAY02   VERSION NBR: 0001
                PRESS ENTER TO DELETE REPLAY
                OR
                PRESS PF3 TO CANCEL DELETE
```

Figure 4.5: Delete Replay Screen

4.5 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, shown in Figure 4.6, 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

```

Figure 4.6: Move Replay Screen

4.6 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, shown in Figure 4.7, 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

```

Figure 4.7: Print Replay Screen

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.

Figure 4.8 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

PRINTER DESTINATION (optional)--Enter a destination for the printer.

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

Default value : 55

Once the print request has been successfully submitted, a message is displayed in the message area. You can then return to the Select Replay screen by pressing PF3, or proceed directly to the Move Replay screen by pressing PF10.

ID	RELEASE	CA-IDMS/ADS Trace	DATE	TIME	PAGE
ATyyymm	Rnn.nn	PRINT REPLAY	mm/dd/yy	hh:mm:ss	nnnn
LINE	REPLAY TEXT				
1	DADQD547 DADQ-PM-547-GET-ELEMBTS		mm/dd/yy	hh:mm:ss	
2	DADQD547 DEFINE SUBROUTINE VALIDATE.				
3	DBACCESS GET SCREATCH AREA ID W003-SCRATCH-AREA-NME KEEP				
4	DBACCESS INTO W003-DQF-SCRATCH-CONTROL				
5	DBACCESS RECORD ID W003-SCRATCH-REC-ID-CDE.				
6	DBACCESS ERROR-STATUS = 0000				
7	DADQD547 DEFINE SUBROUTINE SETUPMAP.				
8	DBACCESS GET SCRATCH AREA ID W003-SCRATCH-AREA-NME KEEP				
9	DBACCESS INTO W341-DQF-SCRATCH				
10	DBACCESS RECORD W341-CURRENT-CNT				
11	DBACCESS ERROR-STATUS = 0000				
12	DBACCESS GET SCRATCH AREA ID W003-SCRATCH-AREA-NME KEEP				
13	DBACCESS INTO W341-DQF-SCRATCH				
14	DBACCESS RECORD W341-CURRENT-CNT				
15	DBACCESS ERROR-STATUS = 0000				
16	DBACCESS GET SCRATCH AREA ID W003-SCRATCH-AREA-NME KEEP				
17	DBACCESS INTO W341-DQF-SCRATCH				
18	DBACCESS RECORD W341-DQF-SCRATCH				
19	DBACCESS ERROR-STATUS = 0000				

Figure 4.8: Printed Replay

4.7 Select Replay

Figure 4.9 illustrates the Select Replay screen. The 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 Figure 4.9, 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.

```
ADST          Rnn.nn --- SELECT REPLAY ----- hh:mm:ss mm/dd/yy
DICTIONARY: ACCT                                     PAGE:  1 OF:  1
OPTIONS: V=VIEW REPLAY
          M=MOVE REPLAY
          P=PRINT REPLAY
          D=DELETE REPLAY
```

OPT	REPLAY NBR	DIALOG	VERSION NBR	NBR OF LINES	DATE	TIME
V	1	ACDPAY01	0001	0250	mm/dd/yy	hh:mm
	2	ACDPAY01	0001	0043	mm/dd/yy	hh:mm
	3	ACDPAY01	0001	0125	mm/dd/yy	hh:mm

Figure 4.9: Select Replay Screen

4.8 View Replay

Figure 4.10 shows a View Replay screen. The fields in the exhibit are described below.

```

ADST          Rnn.nn --- VIEW REPLAY ----- hh:mm:ss mm/dd/yy
DICTIONARY: DEMO                               LINE:  1 OF:  3
ATRPO06I BEGINNING OF ADS/O TRACE DATA
REPLAY NUMBER:  2      DIALOG: ICDVEN01      VERSION NBR: 0001
SKIP:          SEARCH:
  1 ICDVEN01 ICDVEN01-RP-INQVEN
  2 DBACCESS  OBTAIN CALC VENDOR.
  3 DBACCESS  ERROR-STATUS = 0326

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

```

Figure 4.10: View Replay Screen

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.

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 imbedded 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.

4.8.1 Control Command Replay Separators

In order to help the user see more graphically the flow of control of the traced dialog, CA-IDMS/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. Figure 4.10 shows examples.

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

Control Command	Separator Line
DISPLAYABOUT TO DISPLAY....
DISPLAY CONTINUEABOUT TO DISPLAY CONTINUE....
EXECUTE NEXT FUNCTIONABOUT TO EXECUTE NEXT FUNCTION....
INVOKEABOUT TO INVOKE DIALOG....
LEAVEABOUT TO LEAVE....
LINKABOUT TO LINK....
RETURNABOUT TO RETURN....
TRANSFERABOUT TO TRANSFER TO DIALOG....

CA-IDMS/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

```

Figure 4.11: Control Command Separators

Chapter 5. Operations

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This chapter presents system requirements, operational considerations, and storage requirements for CA-IDMS/ADS Trace.

5.1 System Requirements

System requirements for CA-IDMS/ADS Trace include the operating environment, the terminal type, and the subschema.

5.1.1 Operating Environment

CA-IDMS/ADS Trace supports these product releases:

- CA-IDMS Release 15.0
- CA-ADS Release 15.0

5.1.2 Terminal Type

CA-IDMS/ADS Trace can be used from these terminals:

- IBM 3270-type terminal (models 2 through 5), including the 3279 color display.

5.1.3 Subschema

CA-IDMS/ADS Trace uses the IDMSNWKA subschema.

5.1.4 Security

Normal CA-IDMS security applies. You can limit access to CA-IDMS/ADS Trace by setting security on the task code ADST (or the modified task code specified in your sysgen tables).

5.2 Operational Considerations

When using CA-IDMS/ADS Trace, you may want to keep track of many replays. You should also be aware of the appearance of the trace statements that CA-IDMS/ADS Trace inserts in your dialog.

5.2.1 Keeping Track of Replays

For several replays of one dialog, you may want to keep notes describing the purpose and conditions of each numbered replay.

5.2.2 Flagged Code

When looking at the source code of a dialog after a trace has been generated, you can see the flags that CA-IDMS/ADS Trace places on each line. All of the code that CA-IDMS/ADS Trace adds to your dialog source is flagged with ADSTRACE in columns 73-80. When literals or exhibits are added to the code, CA-IDMS/ADS Trace puts ADSTEXB in columns 73 to 79.

Do not change any of this generated code. If the generated code is changed, unpredictable results will occur.

5.2.3 Run DDDL Job Against Each Dictionary

Be sure that the DDDL job was run against each dictionary where development will be done. For more information, see the *CA-IDMS installation guides*.

5.2.4 Ensure Unique Names in Scratch Area

CA-IDMS/ADS Trace uses the name of a traced dialog to identify the scratch area assigned to replays of that dialog. If you have a scratch area identified by the name of a dialog, you should change the name of the area before executing a traced dialog of the same name.

5.3 Storage Requirements

CA-IDMS/ADS Trace uses the program pool, the storage pool, and the scratch/queue area.

5.3.1 Program Pool

Since all CA-IDMS/ADS Trace run-time modules are reentrant, only one copy of CA-IDMS/ADS Trace is required to support multiple users. At trace definition time--when traces are being turned on or when Select Replay options are being used--CA-IDMS/ADS Trace requires 120K of program storage for an average session.

At execution time, when the traced dialog is being run and replays are being created, CA-IDMS/ADS Trace requires 7.5K of program storage for a session.

5.3.2 Storage Pool

A session storage block is used for communication between CA-IDMS/ADS Trace modules. At trace definition time, each terminal user requires 12K of storage for an average session.

At execution time, each terminal user requires 3K of storage for an average session.

5.3.3 Scratch Area

At trace definition time, you can use the following formula to calculate the number of bytes of scratch required per terminal:

$$\text{number-of-unique-screens} * \text{lines-per-screen} * 100$$

The maximum number of lines per screen is 15.

For example, if there are 20 unique screens, and 15 lines per screen, the formula yields:

$$20 * 15 * 100 = 30000 \text{ bytes}$$

At execution time, you can use the following formula to calculate the number of bytes in the scratch area required for each dialog at a terminal:

$$2619 + (\text{total-lines} * 172)$$

where total-lines is the total number of lines in all replays for the dialog (maximum 5000).

To calculate the total number of bytes, add the number of bytes for each dialog.

5.3.4 Queue Area

At trace definition time, you can use the following formula to calculate the required number of bytes per dialog in the queue area (DDLDCRUN):

$$59 + (\text{total-lines} * 205)$$

where total-lines is the total number of lines in all replays for the dialog.

For example, if the dialog has replays of 30, 60, and 100 lines, the number of bytes for the dialog is:

$$59 + (190 * 250) = 47500, \text{ or approximately } 47.5\text{K}.$$

To calculate the total number of bytes, add the number of bytes for each dialog.

System Requirements:

Item	Requirement
Operating Environment	CA-IDMS Release 15.0 CA-ADS Release 15.0
Terminal Type	IBM 3270-type (models 2 through 5), including 3279 color display.
Subschema	IDMSNWKA

Storage Requirements:

		Definition Time	Execution Time
Program Pool	one copy, multiple users	average session: 120K	7.5K
Storage Pool	each user	average: 12K	average session: 3K
Scratch Area	each dialog	# screens * (# lines) * (100)	2619 + (# lines * 172)
Queue Area	each dialog	59 + (# lines * 205)	

Figure 5.1: System and Storage Requirements

Chapter 6. Messages

This chapter describes the messages generated by CA-IDMS/ADS TRACE. CA-IDMS/ADS TRACE messages are preceded by an alphanumeric code that ends with a letter indicating the severity. The severity code is either **I**, **W**, or **E**. This chapter lists for each message the code, the text, and an explanation.

Informative—The severity code **I** indicates an informative message. Informative messages are for your information only: no remedial action is required.

Warning—The severity code **W** indicates a warning. Warning messages report conflicting data or various processing conditions.

Error—The severity code **E** indicates an error. When CA-IDMS/ADS TRACE encounters an error condition, an error message appears on your screen. Error messages report erroneous and conflicting data that require action.

ATGT021I PROCEED WITH ADSC FOR TRACED DIALOGS - INCLUDE AT-LINK-RECORD

Reason: Trace statements for the specified trace options have been inserted in the code, as indicated in the message for each process.

Action: Leave CA-IDMS/ADS TRACE, access ADSC, add the work record, recompile the dialog, and execute the dialog.

ATGT023I INCLUDE SOURCE AFTER TRACE ON

Reason: A TRACE ON statement was encountered with no source code following.

Action: Either remove the TRACE ON statement, or reposition it within the source code.

ATGT024I CORRECT EXHIBIT ERROR AND RESUBMIT

Reason: There is an error in the EXHIBIT statement.

Action: Correct the error in the source code, access the Build Trace Code screen again, and enter the TRACE ON option next to the process name. The Chapter 3, "Trace Generation" gives complete details on EXHIBIT syntax.

ATGT025I BEGINNING OF DIALOG PROCESSES

Reason: The system is displaying the first page of a series of pages on the Build Trace Code screen.

Action: None.

ATGT026I END OF DIALOG PROCESSES

Reason: The system is displaying the last page of a series of pages on the Build Trace Code screen.

Action: None.

ATGT028I PRINT REPLAY REQUEST HAS BEEN SUBMITTED

Reason: The request to have the replay printed has been sent to the printer.

Action: None.

ATGT029I PRINT REPLAY AND DELETE REQUEST HAS BEEN SUBMITTED

Reason: The request to have the replay printed has been sent to the printer. The replay is also being deleted.

Action: None.

ATGT050W DIALOG VERSION NOT NUMERIC - RETRY

Reason: The version entered for the dialog is not numeric.

Action: Enter an integer for the version number.

ATGT051W A MAXIMUM OF 5000 REPLAY LINES IS ALLOWED

Reason: A number greater than 5000 was entered in the Line Limit field.

Action: Enter a number between 3000 and 5000; the number must be greater than any previously entered line limit for this dialog.

ATGT052W INVALID LINE LIMIT ENTERED - RETRY

Reason: The line limit entered is not numeric.

Action: Enter a numeric line limit.

ATGT053W GENERATE WAIT INTERVAL MUST BE 1 TO 500

Reason: An invalid interval was entered in the Generate Wait Interval field.

Action: Enter an integer between 1 and 500.

ATGT054W INVALID GENERATE WAIT INTERVAL ENTERED - RETRY

Reason: The generate wait interval entered is not numeric.

Action: Enter a numeric generate wait interval.

ATGT055W INVALID DIALOG NAME - RE-ENTER

Reason: The specified dialog name is not valid.

Action: Enter a valid dialog name.

ATGT056W VERSION SPECIFIED NOT FOUND FOR THIS DIALOG - RETRY

Reason: The specified version number is not listed for the specified dialog.

Action: Enter another version number, or delete the version number so that the default value will be processed.

ATGT057W OPTION "I" SPECIFIED UNDER TRACE ON NO TRACE ON STMNT FOUND

Reason: The option "I" was specified in the TRACE ON column, but there was no TRACE ON statement found in the dialog or process being traced.

Action: Either specify another option for the dialog or process, or leave CA-IDMS/ADS TRACE and enter TRACE ON and TRACE OFF statements in the source code. Then reenter CA-IDMS/ADS TRACE and resubmit the internal trace.

ATGT063W ENTER EITHER A DIALOG NAME OR MODULE NAME

Reason: On the Build Trace Code screen, both dialog and process names were entered.

Action: Delete the dialog name or the process names and press ENTER.

ATGT067W CANNOT LOWER LINE LIMIT VALUE

Reason: A line limit lower than the previous line limit was entered.

Action: Enter a line limit greater than the one previously entered for this dialog.

ATGT068W LINE LIMIT MAY NOT BE INCREASED WHEN NO LINES USED

Reason: The line limit can be updated only after a trace has been run.

Action: Execute the dialog. Then return to the Build Trace Code screen to update the line limit.

ATRP001I NO REPLAYS FOUND TO SELECT

Reason: There are no replays in the Select Replay selection list.

Action: Either create a replay from the queue, or generate a new replay.

ATRP002I MORE REPLAYS TO SELECT

Reason: There are more replays available for selecting than are listed on the current page.

Action: If you want to see the other replays available, use PF keys to page through the series of screens.

ATRP003I END OF SELECT REPLAY DATA

Reason: The screen displayed is the last screen of a series of replays available for selecting.

Action: None.

ATRP004I PRESS PF7 TO SEE MORE

Reason: On the View Replay screen, the last line of data is shown.

Action: Press PF7 to page back through the replay data.

ATRP005I PRESS PF8 TO SEE MORE

Reason: On the View Replay screen, more pages of replay data exist.

Action: Press PF8 to view more replay data.

ATRP006I BEGINNING OF ADS/O TRACE DATA

Reason: On the View Replay screen, the beginning of the trace is displayed.

Action: None.

ATRP007I END OF ADS/O TRACE DATA

Reason: On the View Replay screen, the end of the trace is displayed.

Action: None.

ATRP008I NO REPLAY TO MOVE

Reason: The PF key for the moving a replay was pressed a second time, but there is no replay to move.

Action: Press PF3 to return to the Select Replay screen.

ATRP009I REPLAY HAS BEEN MOVED. PF3 FOR SELECT REPLAY

Reason: The specified replay has been moved to the queue.

Action: Press PF3 to return to the Select Replay screen.

ATRP010I NO REPLAY TO PRINT

Reason: On the View Replay screen, the PF key for printing a replay was pressed a second time, but there was no replay to print.

Action: Press PF3 to return to the Select Replay screen.

ATRP011I REPLAY HAS BEEN PRINTED

Reason: The specified replay has been sent to the printer.

Action: None.

ATRP012I NO REPLAY TO DELETE

Reason: On the View Replay screen, the PF key for deleting a replay was pressed, but there was no replay to delete.

Action: Press PF3 to return to the Select Replay screen.

ATRP013I REPLAY HAS BEEN DELETED. PF3 FOR SELECT REPLAY

Reason: The replay has been deleted, as requested.

Action: Press PF3 to return to the Select Replay screen.

ATRP014I REQUESTED REPLAY MOVED TO QUEUE FILE

Reason: The replay was moved to the queue file, as requested.

Action: None.

ATRP015I REQUESTED REPLAY HAS BEEN DELETED

Reason: The replay was deleted, as requested.

Action: None.

ATRP027I NO LOGICAL TERMINALS ASSOCIATED WITH PRINTER

Reason: CA-IDMS has no logical terminals associated with a printer.

Action: Contact your system administrator.

ATRP030I NO REPLAYS FOUND FOR USER ID ENTERED

Reason: On the Create Replay From Queue screen, there are no replays found in the queue area associated with the user ID entered.

Action: Blank out the user ID field and select for all user ids, or enter another user id.

ATRP031I TRACE LIMIT REACHED - REPLAY RETAINED IN QUEUE

Reason: The replay was not moved to the scratch area because the line limit was reached.

Action:

1. If the line limit can be increased, return to the Build Trace Code screen and increase the line limit for the dialog. Then return to the Create Replay from Queue screen and create the replay again.

2. Otherwise, delete all the replays for the dialog. Then return to the Create Replay from Queue screen and create the replay again.

ATRP042W ONLY ONE OPTION CAN BE ENTERED AT A TIME

Reason: More than one option was entered in the OPTION field.

Action: Delete the extra options and press ENTER.

ATRP044W SEARCH CHARACTER(S) NOT FOUND - RETRY

Reason: The characters specified in the search field were not found.

Action: Enter a new string of characters or proceed with another command.

ATRP045W SELECT EITHER SKIP OR SEARCH FIELD - NOT BOTH

Reason: Entries were made in both the SKIP and SEARCH fields.

Action: Delete the entry in either the SKIP or the SEARCH field.

ATRP046W SKIP FIELD NOT NUMERIC - RETRY

Reason: An entry made in the SKIP field is not numeric.

Action: Enter a number in the SKIP field and press PF7 or PF8.

ATRP047W SPECIFY QUEUE FILE RETENTION PERIOD 1 THRU 9

Reason: On the Move Replay screen, the retention field was blank.

Action: Enter an integer from 1 through 9 for the queue file retention period.

ATRP058W INVALID PRINTER CLASS - 01 THRU 64 ONLY

Reason: A printer class other than 1 through 64 was entered.

Action: Enter a printer class from 1 through 64.

ATRP059W PRINT CLASS NOT NUMERIC - 01 THRU 64 ONLY

Reason: The entry for the printer class was not numeric.

Action: Enter an integer from 1 to 64.

ATRP060W SELECT EITHER PRINT CLASS OR PRINT DESTINATION - NOT BOTH

Reason: Both a printer class and a printer destination were entered.

Action: Delete the printer class or the printer destination and press ENTER.

ATRP061W INVALID PRINTER DESTINATION - RETRY

Reason: The specified printer destination is invalid.

Action: Consult your system administrator to determine the correct printer destination.

ATRP062W INVALID TERMINAL TYPE FOR PRINT REQUEST - RETRY

Reason: The output terminal type is not correct for the print request.

Action: Consult your system administrator for more information.

ATRP066W SELECT EITHER A USER ID OR AN OPTION

Reason: On the Create Replay screen, both a user ID and an option were entered.

Action: Enter a user ID or an option, but not both.

ATRP069W SKIP NBR MUST NOT BE GREATER THAN TOTAL NBR OF LINES

Reason: The number entered in the SKIP field was greater than the number of lines in the replay.

Action: Enter a number in the skip field that is less than the total number of lines in the replay.

ATRP087E PRINT QUEUE ERROR

Reason: An I/O error has occurred while placing the record in the print queue.

Action: Retry the print request; if the problem persists, contact Computer Associates Product Support.

ATRP088E VARIABLE STORAGE ERROR

Reason: The variable storage field that contains the record to be printed was not allocated.

Action: Contact Computer Associates Product Support.

ATRP089E WRITE PRINTER ERROR

Reason: A terminal I/O error occurred.

Action: Retry the print request; if the problem persists, contact Computer Associates Product Support.

ATTS016I NO PROCESSES HAVE BEEN TRACED

Reason: On the Review Trace Status screen, no processes have trace code on.

Action: None.

ATTS017I NO PROCESSES HAVE BEEN TRACED FOR YOUR USER ID

Reason: On the Review Trace Status screen, no dialogs have been traced under the user ID entered.

Action: Press PF2 to access the Build Trace Code screen if you want to trace a dialog or a process.

ATTS018I ALL TRACED PROCESSES HAVE BEEN DISPLAYED

Reason: On the Review Trace Status screen, all traced processes have been listed for the user ID entered.

Action: None.

ATTS019I BEGINNING OF TRACED PROCESSES HAS BEEN REACHED

Reason: PF5 was pressed on the Review Trace Status screen; the top of the list of traced processes is displayed.

Action: None.

ATTS020I END OF TRACED PROCESSES HAS BEEN REACHED

Reason: PF6 was pressed on the Review Trace Status screen; the end of the list of traced processes is displayed.

Action: None.

ATXX041W ENTER AN OPTION

Reason: Nothing was entered in the OPTION field on the screen.

Action: Enter a valid option from the ones listed on the screen.

ATXX043W INVALID OPTION

Reason: The option entered was not one of those listed on the screen.

Action: Enter one of the options listed on the screen.

ATXX064W INVALID NODE NAME - RETURN TO MAIN MENU AND RETRY

Reason: An invalid node name was entered on the Main Menu screen.

Action: Enter the correct node name on the Main Menu screen.

ATXX081E GET SCRATCH ERROR idms-status-code

Reason: CA-IDMS/ADS TRACE tried to read a scratch record and encountered an unexpected condition.

Action: Check scratch area utilization. If the problem recurs, call Computer Associates Product Support.

ATXX082E PUT SCRATCH ERROR idms-status-code

Reason: CA-IDMS/ADS TRACE tried to write a scratch record and encountered an unexpected condition.

Action: Check scratch area utilization. If the problem recurs, call Computer Associates Product Support.

ATXX083E GET QUEUE ERROR idms-status-code

Reason: CA-IDMS/ADS TRACE tried to retrieve a queue record and encountered an unexpected condition.

Action: Check queue area utilization. If the problem recurs, call Computer Associates Product Support.

ATXX084E PUT QUEUE ERROR idms-status-code

Reason: CA-IDMS/ADS TRACE tried to write a queue record and encountered an unexpected condition.

Action: Check queue area utilization. If the problem recurs, call Computer Associates Product Support.

ATXX085E DATABASE ERROR STATUS idms-status-code

Reason: CA-IDMS/ADS TRACE encountered an unexpected condition.

Action: Contact Computer Associates Product Support.

ATXX086E DELETE SCRATCH ERROR idms-status-code

Reason: CA-IDMS/ADS TRACE tried to delete a replay from scratch and encountered an unexpected condition.

Action: Check scratch area utilization. If the condition recurs, contact Computer Associates Product Support.

ATXX090E DELETE QUEUE ERROR idms-status-code

Reason: CA-IDMS/ADS TRACE tried to delete a queue record and encountered an unexpected condition.

Action: Check queue area utilization. If the problem persists, contact Computer Associates Product Support.

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