CA-ADS®

Quick Reference
15.0

Computer Associates™

This documentation and related computer software program (hereinafter referred to as the “Documentation”) is for the end user's informational purposes only and is subject to change or withdrawal by Computer Associates International, Inc. (“CA”) at any time.

THIS DOCUMENTATION MAY NOT BE COPIED, TRANSFERRED, REPRODUCED, DISCLOSED, OR DUPLICATED, IN WHOLE OR IN PART, WITHOUT THE PRIOR WRITTEN CONSENT OF CA. THIS DOCUMENTATION IS PROPRIETARY INFORMATION OF CA AND PROTECTED BY THE COPYRIGHT LAWS OF THE UNITED STATES AND INTERNATIONAL TREATIES.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, CA PROVIDES THIS DOCUMENTATION “AS IS” WITHOUT WARRANTY OF ANY KIND, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT. IN NO EVENT WILL CA BE LIABLE TO THE END USER OR ANY THIRD PARTY FOR ANY LOSS OR DAMAGE, DIRECT OR INDIRECT, FROM THE USE OF THIS DOCUMENTATION, INCLUDING WITHOUT LIMITATION, LOST PROFITS, BUSINESS INTERRUPTION, GOODWILL, OR LOST DATA, EVEN IF CA IS EXPRESSLY ADVISED OF SUCH LOSS OR DAMAGE.

THE USE OF ANY PRODUCT REFERENCED IN THIS DOCUMENTATION AND THIS DOCUMENTATION IS GOVERNED BY THE END USER'S APPLICABLE LICENSE AGREEMENT.

The manufacturer of this documentation is Computer Associates International, Inc.

Provided with “Restricted Rights” as set forth in 48 C.F.R. Section 12.212, 48 C.F.R. Sections 52.227-19(c)(1) and (2) or DFARS Section 252.227.7013(c)(1)(ii) or applicable successor provisions.

First Edition, December 2000

© 2000 Computer Associates International, Inc.
One Computer Associates Plaza, Islandia, NY 11749
All rights reserved.

All trademarks, trade names, service marks, or logos referenced herein belong to their respective companies.

Contents

How to Use This Guide v

Chapter 1. Application Compiler Control Keys and Screens 1-1
1.1 Application Compiler Overview 1-2
1.2 Default Control Keys 1-3
1.3 Main Menu Screen 1-4
1.4 General Options Screen - Page 1 1-5
1.4.1 General Options - Page 2 1-6
1.5 Response/Function List Screen 1-7
1.5.1 Response Definition Screen 1-8
1.5.2 Function Definition (Dialog) Screen 1-10
1.5.3 Function Definition (Program) Screen 1-12
1.5.4 Function Definition (Menu) Screen 1-14
1.6 Global Records Screen 1-17
1.7 Task Codes Screen 1-18

Chapter 2. Dialog Compiler Control Keys and Screens 2-1
2.1 Dialog Compiler Overview 2-2
2.2 Default Control Keys 2-3
2.3 Main Menu Screen 2-4
2.4 Options and Directives Screen 2-5
2.5 Map Specifications Screen 2-7
2.6 Database Specifications Screen 2-9
2.7 Records and Tables Screen 2-11
2.8 Process Modules Screen 2-12

Chapter 3. Runtime System Initiating Statement 3-1

Chapter 4. Dialog Compiler Directive 4-1

Chapter 5. Test Conditions, Constants and Syntax Expansions 5-1
5.1 Test Conditions 5-2
5.2 Figurative Constants 5-5
5.3 Logical Record Expressions 5-6
5.4 Control-Options 5-7
5.5 Error-Expression 5-8
5.6 Lock-Options 5-9
5.7 Message-Options 5-10
5.8 Page-Specification 5-11
5.9 Arithmetic-Expression 5-12
5.10 Variables 5-13

Chapter 6. System-Supplied Functions 6-1

Chapter 7. Process Commands 7-1
7.1 Process Command Summary 7-2
7.2 Arithmetic and Assignment Commands 7-6

7.3 Conditional Commands 7-8
7.4 Flow of Control Commands 7-9
7.5 Navigational DML 7-11
7.6 Logical Record Facility Commands 7-15
7.7 Map Commands 7-16
7.8 Pageable Map Commands 7-19
7.9 Queue and Scratch Management Commands 7-20
7.10 Subroutine Control Commands 7-23
7.11 Utility Commands 7-24

Chapter 8. APPC Programming 8-1
8.1 Cooperative Processing Command Summary 8-2
8.2 Cooperative Processing Commands 8-4
8.3 Conversation States 8-6
8.4 APPC Status 8-8
8.5 OSCaR Commands 8-9

Chapter 9. ADSORPTS 9-1

Chapter 10. Application and Dialog Utilities 10-1
10.1 ADSOBCOM 10-2
10.2 ADSOBSYS 10-10
10.3 ADSOBTAT 10-11
10.4 ADSOTATU 10-12

Chapter 11. Assembler Macros 11-1

Chapter 12. CA-ADS System Records 12-1
12.1 ADSO-APPLICATION-GLOBAL-RECORD 12-2
12.2 ADSO-APPLICATION-MENU-RECORD 12-5
12.3 ADSO-STAT-DEF-REC 12-6

Chapter 13. Error Status Codes 13-1
13.1 Autostatus Return Codes 13-2
13.2 Default Level-88 Values 13-3
13.3 Major DB Status Codes 13-4
13.4 Minor DB Status Codes 13-5
13.5 Major DC Status Codes 13-10
13.6 Minor DC Status Codes 13-11
13.7 ERROR-STATUS Condition Names 13-15

Chapter 14. SYSIDMS Parameters 14-1

Chapter 15. Online Debugger Syntax 15-1
15.1 Debugger Symbols 15-2
15.2 User Symbols 15-4
15.3 Program Symbols 15-5
15.4 Expression Operators 15-6
15.5 Delimiters 15-7
15.6 Debugger Commands 15-8

How to Use This Guide

This quick reference applies to Release 15.0 of CA-ADS and accompanies the *CA-ADS Reference* manual.

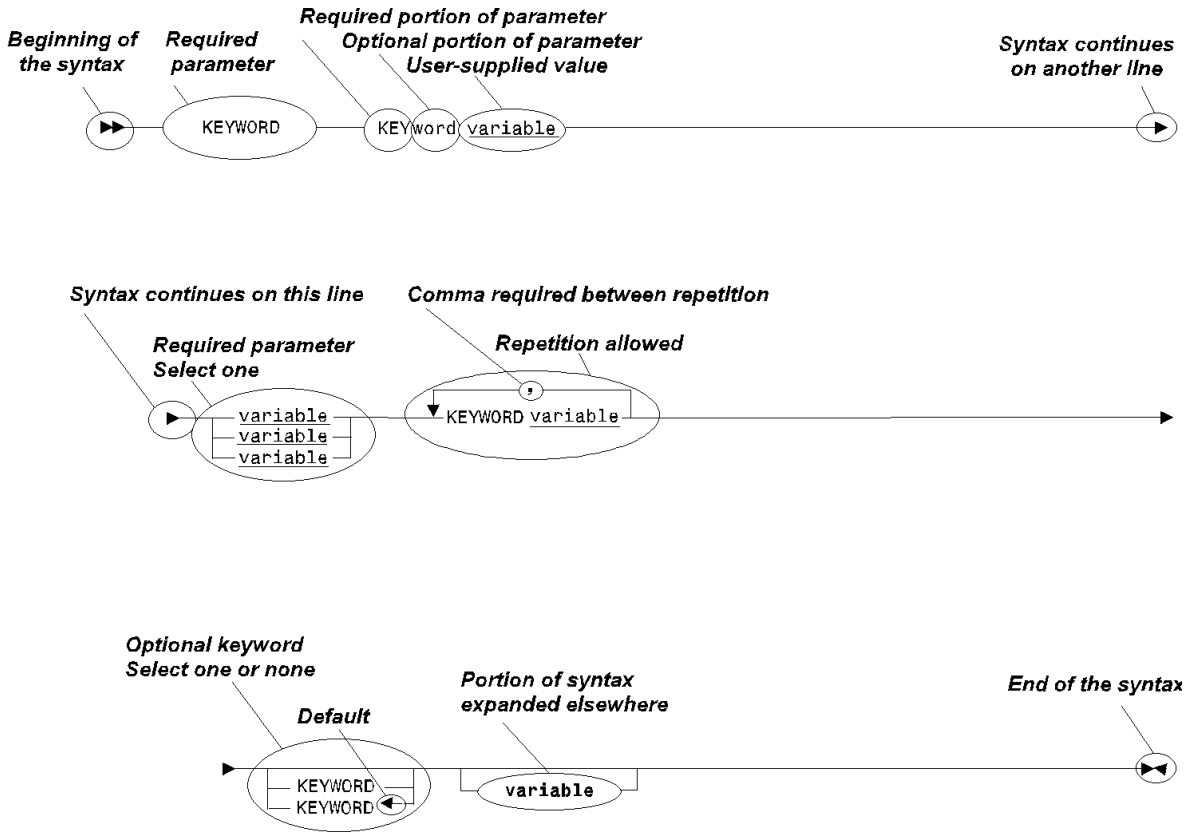
Understanding Syntax Diagrams

Look at the list of notation conventions below to see how syntax is presented in this guide. The example following the list shows how the conventions are used.

`UPPERCASE`
`OR`
`SPECIAL CHARACTERS`
	Represents a required keyword, partial keyword, character, or symbol that must be entered completely as shown.

`lowercase`	Represents an optional keyword or partial keyword that, if used, must be entered completely as shown.
`underlined lowercase`	Represents a value that you supply.
←	Points to the default in a list of choices.
`lowercase bold`	Represents a portion of the syntax shown in greater detail at the end of the syntax or elsewhere in the document.
►►────────────	Shows the beginning of a complete piece of syntax.
────────────►◄	Shows the end of a complete piece of syntax.
────────────►	Shows that the syntax continues on the next line.
►────────────	Shows that the syntax continues on this line.
────────────►─	Shows that the parameter continues on the next line.
─►────────────	Shows that a parameter continues on this line.
►── parameter ──►	Shows a required parameter.
►┬─ parameter ─┬──► └─ parameter ─┘	Shows a choice of required parameters. You must select one.
►┬──────────┬──► └─ parameter ─┘	Shows an optional parameter.
►┬──────────┬──► ├─ parameter ─┤ └─ parameter ─┘	Shows a choice of optional parameters. Select one or none.
►┬─▼─────┬──► └─ parameter ─┘	Shows that you can repeat the parameter or specify more than one parameter.
►┬─▼─ , ─┬──► └─ parameter ─┘	Shows that you must enter a comma between repetitions of the parameter.

Sample Syntax Diagram



Chapter 1. Application Compiler Control Keys and Screens

1.1 Application Compiler Overview

Step In Process	Screen	Purpose
Application specification	Main Menu	Identifies the name and characteristics of an application and specifies the action to be taken.
General options	General Options	Specifies application options for date format, print options, security and maximum number of responses.
Response/function definition	Response/Function List	Specifies the relationship between functions and responses.
	Response Definition	Specifies the name and characteristics of a response.
	Function Definition (Dialog)	Allows specification of a function and associated dialog and valid responses for the dialog or menu/dialog function currently being defined.
	Function Definition (Program)	Specifies the name and description of the associated program and records to be passed to a user program function.
	Function Definition (Menu)	Specifies characteristics for a function defined as a menu; allows alteration of the sequence or suppression of the display of responses on a menu screen.
Global records	Global Records	Specifies records available to all functions in an application.
Task codes	Task Codes	Specifies DC/UCF task codes that initiate an application at runtime.

1.2 Default Control Keys

Activity	Control Key	Description
HELP	[PF1]	Displays a map or field help screen, depending on cursor position. If the cursor is on a map field associated with help text, a half screen of map field help text is displayed. If the cursor is set on a map field not associated with help text or anywhere else on the map, a full screen of map help text is displayed.
RETURN	[PF3]	From a pull-down window, returns to specification area. From the Main Menu screen, returns control to DC/UCF. From a screen other than the Main Menu screen, applies updates to the current screen and returns to the Main Menu screen.
BACKWARD	[PF4]	Applies updates to the current screen and displays the previous step in the **process**, as outlined on the Main Menu screen.
FORWARD	[PF5]	Applies updates to the current screen and displays the next step in the **process**, as outlined on the Main Menu screen.
BACKPAGE	[PF7]	Displays the previous screen of any step containing multiple screens.
FORWARD PAGE	[PF8]	Displays the next screen of any step containing multiple screens.
ACTION	[PF10]	Toggles the cursor position between the activity selection area action bar and the specification area on the Main Menu screen.

1.3 Main Menu Screen

```
    Add  Modify  Compile  Delete  Display  Switch
.________________________________________________________________________.

                        CA-ADS Application Compiler

                   Computer Associates International, Inc.


     Application name . . . .    ________
     Application version  . .    ____
     Dictionary name  . . . .    ________
     Dictionary node  . . . .    ________

     Screen . . . . . . . . . _    1. General options
                                   2. Responses and Functions
                                   3. Global records
                                   4. Task codes


           Copyright (C) 1972,2000 Computer Associates International, Inc.

   Command ===>
   Enter  F1=Help  F3=Exit  F10=Action
```

Field	Description
Application name	The current application.
Application version	Version number, in the range 1 through 9999, of the current application.
Dictionary name	The dictionary in which the application load module is stored.
Dictionary node	The node that controls the dictionary specified by **Dictionary name**.
Screen	Prompts for screen sequence.

1.4 General Options Screen - Page 1

```
                              General Options                Page 1  of 2

 Application name:  TESTAPPL   Version:    1


     Description . . .  TEST APPLICATION

     Maximum responses . . . . . . . . . . . . . .   500

     Date format . . . . . . . . . . . . . . . . .  1   1. mm/dd/yy  2. dd/mm/yy
                                                        3. yy/mm/dd  4. yy/ddd

     Execution environment . . . . . . . . . . . .  1   1. Online    2. Batch

     Default execution mode. . . . . . . . . . . .  1   1. Step      2. Fast

     Default print destination . . . . . . . . .

     Default print class . . . . . . . . . . . . .   1



 Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F8=Fwd
```

Field	Description
Application name	The current application (protected field).
Version	The version number, in the range 1 through 9999, of the current application.
Description	Description of the current application. This field is a documentation aid.
Maximum responses	The maximum number of responses, in the range 0 through 9999, that can be defined for the application.
Date format	The format in which the current date appears on runtime menu and help screens.
Execution environment	Whether the application is an online or CA-ADS/Batch application.
Default execution mode	The default execution mode for signon to the application.
Default print destination	A DC/UCF print destination.
Default print class	A DC/UCF print class number in the range 1 through 64.

1.4.1 General Options - Page 2

```
                         General Options              Page 2  of 2

Application name:  TESTAPPL   Version:    1


   Security class. . . . . . .   42

   Menus are . . . . . . . . .  1   1. Not used   2. Security tailored
                                    3. Untailored


   Signon is . . . . . . . . .  1   1. Not used   2. Optional
                                    3. Required

   Signon function is. . . . .





Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F7=Bkwd
```

Field	Description
Application name	The current application (protected field).
Security class	Security class, in the range 1 to 256 (online applications only).
Menus are	Whether runtime menus are security tailored.
Signon is	Whether a signon function is executed for the application.
Signon function is	A signon menu function defined (as **Optional** or **Required**) on the **Function Definition (Menu)** screen.

1.5 Response/Function List Screen

```
                          Response/Function List           Page  1 of  1

Application name:  TESTAPP1   Version:    1

Select    Response    Assigned      Select    Function             Program/
 (/)      name        key            (/)      name/type(1,2,3)*    Dialog name

  _       ________     _____          _       ________ / _         ________

  _       ________     _____          _       ________ / _         ________

  _       ________     _____          _       ________ / _         ________

  _       ________     _____          _       ________ / _         ________

  _       ________     _____          _       ________ / _         ________

  _       ________     _____          _       ________ / _         ________

                                       * Type: 1. Dialog  2. Program  3. Menu


Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F6=Search  F7=Bkwd  F8=Fwd
```

Field	Description
Application name	The current application (protected field).
Version	The version number, in the range 1 through 9999, of the current application.
Select	A nonblank character in this field selects the response or function for further definition.
Response name	The application response.
Assigned key	The control key or control event associated with the current application response: ENTER CLEAR PA1 through PA3 PF1 through PF24 LPEN
Function name/type	The name and type of the application function associated with the response.
Program/dialog name	The program or dialog associated with the function.

1.5.1 Response Definition Screen

```
                              Response Definition

Application name:   TEST1      Version:    1
Response name:      QUIT                                Drop response (/) _
Function invoked:   QUIT
Description . . . . ____________________________            Security class:   1

Response type. . . . . . . 2   1. Global      2. Local

Response execution . . . . 2   1. Immediate   2. Deferred

Assigned key . . . . . . . PF01
Control command. . . . . .  1   1. Transfer               2. Invoke
                                3. Link                   4. Return
                                5. Return continue        6. Return clear
                                7. Return continue clear  8. Transfer nofinish
                                9. Invoke nosave         10. Link nosave




Enter  F1=Help  F3=Exit  F4=Prev  F5=Next
```

Field	Description
Application name	The current application (protected field).
Version	The version number, in the range 1 through 9999, of the current application.
Response name	The application response that was selected on the Response/Function List screen (protected field).
Drop response	Removes the response definition from the application (but not the associated function).
Function invoked	The function invoked by the current application response (protected field).
Description	A 1- to 28-byte description of the current function that is displayed with the associated response name on runtime menu and help screens.
Security class	Specifies the security class for the response. Valid values are 1 to 256.
Response type	▪ **Global** — The response is valid for all functions in the application. ▪ **Local** (default) — The response is valid only for those functions with which it is explicitly associated on the Function Definition screen.
Response execution	Whether the invoked function is immediately executable or deferred.
Assigned key	The control key or control event associated with the current application response: ENTER CLEAR PA1 through PA3 PF1 through PF24 LPEN
Control command	The CA-ADS control command used to pass processing control to the function associated with the response.

1.5.2 Function Definition (Dialog) Screen

```
                         Function Definition (Dialog)       Page   1 of   2

Application name:  GWGAPP01   Version:    1
Function name:     F1                                   Drop function (/) _
Description . . .  DEFINED

Associated dialog . . . . . D1          User exit dialog . . . . . _______
Default response  . . . . . _______

Valid                                    Valid
response(/)  Response Key   Function     response(/)  Response Key   Function

    _        R1       PF01  F1                _        R15      _____ _______
    _        R10      _____ _______           _        R2       PF02  F2
    _        R11      _____ _______           _        R3       PF08  FWD
    _        R12      _____ _______           _        R4       _____ FORWARD
    _        R13      _____ _______           _        R6       _____ HELP
    _        R14      _____ _______           _        R7       _____ _______

                                                              more ...


Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F7=Bkwd  F8=Fwd
```

Field	Description
Page	The page number of the Function Definition (Dialog) screen to be displayed. If more than one page exists for the screen, this field displays the current page of the total number of pages, as shown on the sample screen above. To request the next map page to be displayed: ▪ Press the control key associated with paging forward or paging backward one page (the system generation defaults are [PF8] and [PF7], respectively) ▪ Enter a numeral for the page that you want to access, and press any control key other than keys assigned for paging forward or backward
Application name	The current application (protected field).
Version	The version number, in the range 1 through 9999, of the current application (protected field).
Function name	Displays the name of the current function (protected field).
Drop function	Removes the function definition from the application.
Description	A 1- to 28-byte description of the current function that is displayed with the associated response.
Associated dialog	The dialog or user program associated with the function. If blank, the function is associated with a system-defined menu.
User exit dialog	A dialog to which a dialog function can LINK internally.
Default response	The response initiated by the runtime system when the user presses [Enter] without entering a specific response.
Valid response	A nonblank character in this field indicates that this response is valid for this function.
Response	A response from the Response/Function List screen.
Key	The assigned key that initiates the response.
Function	The function initiated by the response.

1.5.3 Function Definition (Program) Screen

```
                         Function Definition (Program)

Application name: TEST1      Version:    1
Function name:    PROG01                                Drop function (/) _

Associated program . . . . PROG01
Description  . . . . . . . UNDEFINED

                           Records passed              Drop record (/)

         1.        ______________________________          _
         2.        ______________________________          _
         3.        ______________________________          _
         4.        ______________________________          _
         5.        ______________________________          _
         6.        ______________________________          _
         7.        ______________________________          _
         8.        ______________________________          _



Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F7=Bkwd  F8=Fwd
```

Field	Description
Application name	The current application (protected field).
Version	The version number, in the range 1 through 9999, of the current application (protected field).
Function name	The current function, as specified on the Response/Function List screen (protected field).
Drop function	Removes the function definition from the application.
Associated program	The user program with which the current function is associated, as specified on the Response/Function List screen (protected field).
Description	A 1- to 28-byte description of the current function that is displayed with the associated response name on runtime menu and help screens.
Records passed	Records passed to the user program, specified as one of: Record name MAP-CONTROL or MAP_CONTROL SUBSCHEMA-CONTROL or SUBSCHEMA_CONTROL
Drop record	Removes the record from its association with the program function (but does not delete the record definition from the dictionary).

1.5.4 Function Definition (Menu) Screen

```
                         Function Definition (Menu)          Page  1 of  2

 Application name:  TEST       Version:    1
 Function name:     MENU1                                Drop function (/) _
 Description . . .  UNDEFINED

 Associated dialog . . . . .  _______
 Default response  . . . . .  _______     User exit dialog . . . .  _______

 Use signon menu (/). . . . . . . . . . _
 Menu defined by:                       2  1. User      2. System
 Description length . . . . . . . . . . 1  1. Long (28) 2. Short (12)
 Responses per page . . . . . . . . . . 15
 Number of heading lines (0-3). . . . . 0
 Heading line text
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....



 Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F8=Fwd
```

Field	Description
Application name	The current application (protected field).
Version	The version number, in the range 1 through 9999, of the current application (protected field).
Function name	The current function (protected field).
Drop function	Removes the function definition from the application.
Description	A 1- to 28-byte description of the current function that is displayed with the associated response name on runtime menu and help screens.
Associated dialog	The dialog or user program associated with the function. If blank, the function is associated with a system-defined menu.
Default response	The response initiated by the runtime system when the user presses [Enter] without entering a specific response.
User exit dialog	A dialog to which a dialog function can LINK internally.
Use signon menu	Whether the menu is a signon menu.
Menu defined by	Whether the menu is system-defined or user-defined.
Description length	The length in bytes of the description displayed on non-signon menus.
Responses per page	Maximum number of responses, in the range 0 through 50, that can be displayed on one page of a user-defined menu at runtime.
Number of heading lines	The number of heading lines displayed at the top of each page of the runtime menu screen. The default is 0 (that is, no heading lines).
Heading line text	The heading text that is displayed at the top of each page of the runtime menu screen. It can be entered as free-form text in the three 79-byte fields provided.

Function Definition (Menu) Screen - Page 2

```
                         Function Definition (Menu)          Page  2 of  2

Application name:  TEST1      Version:    1
Function name:     MENU1

Valid   Seq.   Response  Key  Function  Valid   Seq.   Response  Key  Function
resp.    #                               Resp.    #

  _    ______  ADD      PF02  F2          _    ______  ________ _____ ________

  _    ______  QUIT     PF01  QUIT        _    ______  ________ _____ ________

  _    ______  ________ _____ ________    _    ______  ________ _____ ________

  _    ______  ________ _____ ________    _    ______  ________ _____ ________

  _    ______  ________ _____ ________    _    ______  ________ _____ ________

  _    ______  ________ _____ ________    _    ______  ________ _____ ________


Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F7=Bkwd  F8=Fwd  F9=Update Seq
```

Field	Description
Application name	The current application (protected field).
Version	The version number, in the range 1 through 9999, of the current application (protected field).
Function name	The current function (protected field).
Valid response	A nonblank character indicates that this response is valid for this function.
Seq. #	The sequence number of each response. It can be modified or suppressed by overtyping it.
Response	Each response selected as valid for the current function (protected field).
Key	The control key or control event associated with the current application response (protected field).
Function	The current function (protected field).

1.6 Global Records Screen

```
                                Global Records                Page  1 of  1

Application name:  TESTAPP1   Version:    1

                   Record name                 Version     Drop record (/)
  1.    ADSO-APPLICATION-GLOBAL-RECORD              1            _

  2.    ______________________________         ____            _

  3.    ______________________________         ____            _

  4.    ______________________________         ____            _

  5.    ______________________________         ____            _

  6.    ______________________________         ____            _

  7.    ______________________________         ____            _

  8.    ______________________________         ____            _


Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F7=Bkwd  F8=Fwd
```

Field	Description
Application name	The current application (protected field).
Version	The version number, in the range 1 through 9999, of the current application.
Record name	Each global record for the application.
Drop record (/)	Removes the record from its association with the application (but does not delete the record definition from the dictionary).

1.7 Task Codes Screen

```
                                  Task Codes                  Page  1 of  1

Application name:  TEST1      Version:    1

              Task Code            Function                   Drop (/)
        1.    ________             ________                      _

        2.    ________             ________                      _

        3.    ________             ________                      _

        4.    ________             ________                      _

        5.    ________             ________                      _

        6.    ________             ________                      _

        7.    ________             ________                      _

        8.    ________             ________                      _


Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F7=Bkwd  F8=Fwd
```

Field	Description
Application name	The current application (protected field).
Version	The version number, in the range 1 through 9999, of the current application (protected field).
Task code	Each DC/UCF task code for the application.
Function name	The current function (protected field).
Drop code	Removes the task code from its association with the application.

Chapter 2. Dialog Compiler Control Keys and Screens

2.1 Dialog Compiler Overview

Step In Process	Screens	Purpose
Dialog specification	Main Menu	Identifies the name of a dialog and specifies the action to be taken.
General options	Options and Directives	Specifies dialog options for activity logging, symbol and diagnostic table building, entry point, COBOL moves, retrieval locks and autostatus capability.
Assign maps	Map Specifications	Associates a map with the dialog, specifies paging options.
Assign database	Database Specifications	Associates a schema and subschema or an access module with the dialog; identifies SQL options.
Assign records and tables	Records and Tables	Associates work records with the dialog; specifies records for which new buffers are allocated when the dialog executes at runtime.
Assign process modules	Process Modules	Associates a premap process, one or more response processes, and a declaration module with the dialog.

2.2 Default Control Keys

Activity	Control Key	Description
HELP	[PF1]	Displays a map or field help screen, depending on cursor position. If the cursor is on a map field associated with help text, a half screen of map field help text is displayed. If the cursor is set on a map field not associated with help text, or anywhere else on the map, a full screen of map help text is displayed.
RETURN	[PF3]	From a pull-down window, returns to specification area. From the Main Menu screen, returns control to DC/UCF. From a screen other than the Main Menu screen, applies updates to the current screen and returns to the Main Menu screen.
BACKWARD	[PF4]	Applies updates to the current screen and displays the previous step in the **process**, as outlined on the Main Menu screen.
FORWARD	[PF5]	Applies updates to the current screen and displays the next step in the **process**, as outlined on the Main Menu screen.
BACKPAGE	[PF7]	Displays the previous screen of any step containing multiple screens.
FORWARD PAGE	[PF8]	Displays the next screen of any step containing multiple screens.
ACTION	[PF10]	Toggles the cursor position between the activity selection area action bar and the specification area on the Main Menu screen.

2.3 Main Menu Screen

```
   Add  Modify  Compile  Delete  Display  Switch
._____________________________________________________________________.

                            CA-ADS Online Dialog Compiler

                        Computer Associates International, Inc.


   Dialog name . . . . . . .   ________
   Dialog version  . . . . .   ________
   Dictionary name . . . . .   ________
   Dictionary node . . . . .   ________

   Screen  . . . . . . . . .   1  1. General options
                                  2. Assign maps
                                  3. Assign database
                                  4. Assign records and tables
                                  5. Assign process modules

       Copyright (C) 1972,2000 Computer Associates International, Inc.

 Command ===>
 Enter  F1=Help  F3=Exit  F10=Action
```

Field	Description
Dialog name	The current dialog.
Dialog version	The version number, in the range 1 through 9999, of the current dialog.
Dictionary name	The dictionary that contains the source modules and the map, access modules and subschema, and record definitions used by the specified dialog.
Dictionary node	(DDS only) The node that controls the dictionary specified by **Dictionary name**.
Screen	Prompts for screen sequence.

2.4 Options and Directives Screen

```
                              Options and Directives

                         Dialog  JPKTD10   Version     1


  Message prefix  . . . . . . . . . . . DC
  Autostatus record . . . . . . . . . . ADSO-STAT-DEF-REC
  Version . . . . . . . . . . . . . . .    1
  Description . . . . . . . . . . . . . ADS DIALOG

  Options and directives  . . . . . . . _ Mainline dialog
                                        _ Symbol table is enabled
                                        / Diagnostic table is enabled
                                        / Entry point is premap
                                        _ COBOL moves are enabled
                                        / Activity logging
                                        / Retrieval locks are kept
                                        / Autostatus is enabled




  Enter  F1=Help  F3=Exit  F4=Prev  F5=Next
```

Field	Description
Dialog	The current dialog (protected field).
Version	The version number, in the range 1 through 9999, of the current dialog (protected field).
Message prefix	A two-character prefix for a message at the dialog level. 'DC' is the default.
Autostatus record	The status definition record used when the current dialog executes at runtime.
Version	The version number, in the range of 1 through 9999, of the named status definition record.
Mainline dialog	A nonblank character indicates that the current dialog is a mainline dialog.
Symbol table is enabled	A nonblank character indicates that a symbol table is created for a dialog.
Diagnostic table is enabled	A nonblank character indicates that the dialog load module contains diagnostic tables (line number tables and offset tables).
COBOL moves are enabled	A nonblank character indicates that the rules of COBOL are used in the conversion between data types and in the rounding or truncation of the results of arithmetic and assignment commands.
Activity logging	A nonblank character indicates that the dialog uses the activity logging facility.
Retrieval locks are kept	A nonblank character indicates database record retrieval locks will be held on behalf of run units started by the dialog.
Autostatus is enabled	A nonblank character indicates that the autostatus facility is to be used when the current dialog executes at runtime.

2.5 Map Specifications Screen

```
                              Map Specifications

                        Dialog  JPKTD01   Version     1


  Map name  . . . .   _______             Input map . . . . .   _______
  Version . . . . .   ____                Version . . . . . .   ____
                                          Label . . . . . . .   _______
  Paging options    _ 1. Wait
                      2. No Wait          Output map  . . . .   _______
                      3. Return           Version . . . . . .   ____
                                          Label . . . . . . .   _______
  Paging mode . . . _ Update
                    _ Backpage            Suspense file label   _______
                    _ Auto display




 Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F6=Switch Protection
```

Field	Description
Dialog	The current dialog (protected field).
Version	The version number, in the range 1 through 9999, of the current dialog, as specified on the Main Menu screen (protected field).
Map name	The map associated with the current dialog.
Version	Version number, in the range 1 through 9999, of the corresponding map.
Paging options	The method used to determine the runtime flow of control when the user presses a control key during a map paging session.
Paging mode	Parameters for a map paging session.
Input map	(CA-ADS/Batch only) The map is an input file map.
Version	The version number, in the range 1 through 9999, of the current map.
Label	(CA-ADS/Batch only) The OS/390 ddname (VSE/ESA filename, BS2000/OSD linkname, VM/ESA ddname) of a batch dialog input file map.
Output map	(CA-ADS/Batch only) The map is an output file map.
Version	The version number, in the range 1 through 9999, of the current map.
Label	(CA-ADS/Batch only) The OS/390 ddname (VSE/ESA filename, BS2000/OSD linkname, VM/ESA ddname) of a batch dialog output file map.
Suspense file label	(CA-ADS/Batch only) The OS/390 ddname (VSE/ESA filename, BS2000/OSD linkname, VM/ESA ddname) of a batch dialog suspense file.

2.6 Database Specifications Screen

```
                          Database Specifications

                       Dialog  NAME1     Version     1



  Subschema . . . . . . . . . . . .   _______
  Schema  . . . . . . . . . . . . .   _______
  Version . . . . . . . . . . . . .   ____

  Access Module . . . . . . . . . .   NAME1

  SQL Compliance  . . . . . . . . .   _ 1. ANSI-standard SQL
                                        2. FIPS

  Date Default Format . . . . . . .   _ 1. ISO   2. USA   3. EUR   4. JIS
  Time Default Format . . . . . . .   _ 1. ISO   2. USA   3. EUR   4. JIS


Enter  F1=Help  F3=Exit  F4=Prev  F5=Next
```

Field	Description
Dialog name	The current dialog (protected field).
Version	The version number, in the range 1 through 9999, of the current dialog (protected field).
Subschema	The subschema associated with the current dialog.
Schema	The schema with which the subschema is associated.
Version	The version number, in the range 1 through 9999, of the schema.
Access module	The access module associated with the current dialog.
SQL Compliance	The SQL standard to be enforced. If you select neither ANSI-standard SQL nor FIPS, the default is CA-IDMS extended SQL.
Date Default Format	The external date representation format. Date/time formats: ▪ **ISO** specifies the International Standards Organization standard ▪ **USA** specifies the IBM USA standard ▪ **EUR** specifies the IBM European standard ▪ **JIS** specifies the Japanese Industrial Standard Christian Era standard
Time Default Format	The external time representation format.

2.7 Records and Tables Screen

```
                        Records and Tables              Page    1  of    1

                      Dialog NAME1     Version    1

      Name                                 Version      Work  New copy  Drop
   1. AA                                       1        /       _       _

   2. AA                                       1        /       _       _

   3. ____________________________________  ____        _       _       _

   4. ____________________________________  ____        _       _       _

   5. ____________________________________  ____        _       _       _

   6. ____________________________________  ____        _       _       _

   7. ____________________________________  ____        _       _       _

DC498240 Record    2 is defined twice as a work record.


 Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F7=Bkwd  F8=Fwd
```

Field	Description
Dialog	The current dialog (protected field).
Version	The version number, in the range 1 through 9999, of the current dialog (protected field).
Name	Each record assigned the **New** attribute and/or **Work** attribute.
Version	The version number, in the range 1 through 9999, of the record.
Work	Associates the **Work** attribute with the record. Records with the **Work** attribute are available to the dialog as working storage at runtime.
New copy	Associates the **New** attribute with the record. Records with the **New** attribute are allocated new record buffers when the dialog executes at runtime.
Drop	Removes the record from its association with the dialog (but does not delete the record definition from the dictionary).

2.8 Process Modules Screen

```
                              Process Modules              Page    1 of     1

                         Dialog  NAME1     Version     1
  Name    ________________________________                  _  Type
  Version ____                                              _  Execute on errors
  Key     _____   Value  ______________________________     _  Drop

  Name    ________________________________                  _  Type
  Version ____                                              _  Execute on errors
  Key     _____   Value  ______________________________     _  Drop

  Name    ________________________________                  _  Type
  Version ____                                              _  Execute on errors
  Key     _____   Value  ______________________________     _  Drop

  Name    ________________________________                  _  Type
  Version ____                                              _  Execute on errors
  Key     _____   Value  ______________________________     _  Drop

* Type : 1=Declaration  2=Premap  3=Response  4=Default Response
DC498166 Neither a map nor premap are defined


 Enter  F1=Help  F3=Exit  F4=Prev  F5=Next  F7=Bkwd  F8=Fwd
```

Field	Description
Name	The module associated with the current dialog as a premap process, a response process, or a declaration module.
Version	The version number in the range 1 through 9999, of the process source module.
Key	The online control key or batch control event that initiates the runtime response process. Valid specifications are: ENTER CLEAR PA1, PA2, PA3 PF1 through PF24 FWD BWD HDR
Value	A 1- to 32-character response name that can be entered in a $RESPONSE map field to initiate the response process at runtime.
Type	The type of module.
Execute on errors	The response process executes even if the map contains input errors.
Drop	Drops an existing process module from the dialog definition.

Chapter 3. Runtime System Initiating Statement

```
►►─┬─ ads-task-code ──────────────────────────────────────────►─
   │
   ├─ ads-task-code ─┬─┬─────────────┬─┬─ NODe=node-name ─┬─
   │                 │ │ DIAlog= ────┴─dialog-name ─┬─┤
   │                 │ └─ application-task-code ────┴─┘
   │
   └─ idms-dc/ucf-task-code ─┬─ NODe=node-name ─┬─
                             └──────────────────┘

─►──┬─────────────────────────────────────────────────────────►◄
    │
    ├─┬─ DBName=database-name ─┬─┬─ TRACE= ─┬─ALL ─┬─┬
    │ │                        │ │          └─CTL ─┘ │
    │ │                        │ │                   │
    │ └─ DBName=database-name ─┘ │                   │
    │                            │                   │
    └────────────────────────────┴───────────────────┘
```

Chapter 4. Dialog Compiler Directive

```
►►─── INClude ─┬─┬─────────┬─┬─┬─────┬─┬─ process-name ──────────►
               │ │ MODule  │ │ │ IS  │ │
               │ │ PROCESS │ │ │ =   │ │
               │ └─────────┘ │ └─────┘ │
►──┬─┬─────────────────────┬─┬─ . ──────────────────────────►◄
   │ │ version-number      │ │
   │ └─ VERsion ─┬─┬─────┬─┬─┘
   │             │ │ IS  │ │
   │             │ │ =   │ │
   │             └─┴─────┴─┘
```

Chapter 5. Test Conditions, Constants and Syntax Expansions

5.1 Test Conditions

Conditional-Expression

```
                                  ┌─ AND ─┐
                                  │ OR    │
                                  ↓       │
►►──┬─ NOT ( ─┘──┬─ NOT ─┘── test-condition ──┬─ ) ─┘──────────────────►◄
```

Batch-Control Event Condition

```
►►──┬─┬─ $END-OF-FILE ─┬──────────────────────────────────────────►◄
    │ └─ $EOF ─────────┘
    └── $IOERRor ──────┘
```

Arithmetic and Assigment Command Status Condition

```
►►──┬─ ANY-DATA-ERROR - . ──────────────────┬──────────────────────►◄
    ├─ BAD-DATA-TYPE ───────────────────────┤
    ├─ UNSUPPORTED-DATA-CONVERSION ─────────┤
    ├─ NO-NUMBER-EBCDIC/NUMERIC-CONVERSION ─┤
    ├─ INCORRECT-FIELD-LENGTH ──────────────┤
    ├─ INVALID-SUBSCRIPT-VALUE ─────────────┤
    ├─ DATE-FORMAT-ERROR ───────────────────┤
    ├─ SPECIFICATION-EXCEPTION ─────────────┤
    ├─ DATA-EXCEPTION ──────────────────────┤
    ├─ FIXED-POINT-OVERFLOW-EXCEPTION ──────┤
    ├─ FIXED-POINT-DIVIDE-EXCEPTION ────────┤
    ├─ DECIMAL-OVERFLOW-EXCEPTION ──────────┤
    ├─ DECIMAL-DIVIDE-EXCEPTION ────────────┤
    ├─ FLOATING-POINT-DIVIDE-EXCEPTION ─────┤
    ├─ EXPONENT-OVERFLOW-EXCEPTION ─────────┤
    ├─ EXPONENT-UNDERFLOW-EXCEPTION ────────┤
    └─ SIGNIFICANCE-EXCEPTION ──────────────┘
```

Command Status Condition

```
►►──┬── error-status-code-name ──┬──────────────────────────┬──────►◄
    │                            └─ FOR record-name ─┘      │
    │                                                       │
    └─┬─ ERROR-STATUS ──────────┬── comparison-operator  error-status-code ─┘
      └─ status-field-variable ─┘
```

Comparison Condition

```
►►──┬── value  comparison-operator  value ──────────────┬──────►◄
    │                                                   │
    └── string-value ──┬─ MATCHES  ──┬── mask-value ──┘
                       └─ CONTAINS ──┘
```

Cursor Position Condition

```
►►──┬── CURSOR ──┬──────────┬── at ── map-field-name ──────────┬──►◄
    │            └─ NOT ─┘                                     │
    │                                                          │
    └─┬─ CURSOR-COLUMN ──┬── comparison-operator  cursor-position ──┘
      └─ CURSOR-ROW ─────┘
```

Dialog Execution Status Condition

```
►►──── FIRST-TIME ──────────────────────────────────────────────►◄
```

Environment Status Condition

```
►►──┬─ $BATCH  ─┬──────────────────────────────────────────►◄
    └─ $ONLINE ─┘
```

Level-88 Condition

```
►►──── condition-name ──────────────────────────────────────►◄
```

Map Field Status Condition

```
►►──┬─┬─ ALL ──┬─┬─ OF ( ─┬─┬─ map-field-name ─┬─┬─ ) ──┬──────────────►
    │ │─ ANY ──┘ │  ↓ ,   │ │                   │ │      │
    │ │─ SOME ─┘ │        │ │                   │ │      │
    │ └─ NONE ─┐ │        │ │                   │ │      │
    │   NO ────┘ │        │ │                   │ │      │
    │─ ALL ─┬─ BUT ──┬─ ( map-field-name ) ──────┘ │      │
    │       │        │                             │      │
    │       └─ EXCEPT┘                             │      │
    │─ FIELD ──┬─ map-field-name ──────────────────┘      │
    │  DFLD ───┘                                          │
```

```
►──┬─┬─ IS ──┬─┬─ NOT ─┬─┬─ IDENtical ──┬──────────────►◄
   │ │─ ARE ─┘ │       │ │─ CHANged ────┘
   │ │         │       │ │─ TRUNcated ──┘
   │ │         │       │ │─ ERASed ─────┘
   │ │         │       │ └─ in ERRor ───┘
```

Map Paging Status Conditions

```
►►──┬─┬─ $PAGE-READY ──┬─┬──────────────►◄
    │ │─ $PRDY ────────┘ │
    │─┬─ $FULLPAGE ──────┤
    │ │─ $FPG ───────────┘
    │─┬─ $FORWARD ───────┤
    │ │─ $FWD ───────────┘
    │─┬─ $BACKWARD ──────┤
    │ │─ $BWD ───────────┘
    │─┬─ $HEADER ────────┤
    │ │─ $HDR ───────────┘
    │─┬─ $DETAIL ────────┤
    │ │─ $DTL ───────────┘
    │─┬─ $END-OF-DATA ───┤
    │ │─ $EOD ───────────┘
    │─┬─ $DETAIL-NOT-FOUND ─┤
    │ │─ $DNF ──────────────┘
    │─┬─ $MAXIMUM-DETAILS-PUT ─┤
    │ │─ $MDP ─────────────────┘
```

Set Status Condition

```
►►──┬─ SET set-name is ──┬─┬─ NOT ─┬─┬─ EMPTY ──┬──────────►◄
    │                    │ │       │ │          │
    └─ SET set-name MEMBER ──────────────────────┘
```

5.2 Figurative Constants

```
►►─┬──────┬─┬─ 'literal' ──────────────────────────────────────►◄
   └─ ALL ─┘ ├─ SPACEs ──────┤
             ├─ ZEROs ───────┤
             ├─ ZEROES ──────┤
             ├─ HIGH-VALUEs ─┤
             ├─ LOW-VALUEs ──┤
             └─ QUOTEs ──────┘
```

5.3 Logical Record Expressions

LR-Conditional-Expression

```
                    ┌──────────── AND ────────────┐
                    │──────────── OR ─────────────│
►►──┬─ NOT ( ─┘──↓──┬─ dba-designated-keyword ──┬──┬─ ) ─┘──────────►◄
   │                │                          │
   │                │   ┌──────────── lr-comparison ──┐
   │                │   │──────────── test-condition ─│
   │                │   └─ NOT ─┘
```

LR-Comparison

```
►►──┬─┬─ comparison-value ──┬── operator ──┬─ comparison-value ──┬──►◄
   │ │ arithmetic-expression │              │ arithmetic-expression │
   │ │                                                            │
   │ └─ comparison-value ──┬─ CONTAINS ─┬── comparison-value ────┘
   │                       └─ MATCHES ──┘
```

Comparison-Value

```
►►──┬─ literal ──────────────────────────────────────────────────►◄
   ├─ data-field-name-variable ─────────────────────────────────│
   └─ lr-field-name ──┬─ OF lr-name ─┘│┌──────────┐│└─ OF LR ─┘
                      │               │└─ ( ─↓─ subscript ─ ) ─┘│
```

5.4 Control-Options

```
►►─┬─ MAP-CONTROL ─┬─┬─ SUBSCHEMA-CONTROL ─┬──────────────────────────►◄
   └─ MAP_CONTROL ─┘ └─ SUBSCHEMA_CONTROL ─┘
```

5.5 Error-Expression

```
►►── ALLOWing error codes ──────────────────────────────────────►
                          ┌──────────────────────────────────────────┐
                          │                          ,               │
►─(─↓─┬─ error-status-code-name ──────────────────────────────────┬─)─►◄
      └─ 'error-status-code'-──┬──────────────────────────────────┘
                               │                                  │
                               └─┬─ THROUGH ─┬── 'error-status-code' ─┘
                                 └─ THRU ────┘
```

5.6 Lock-Options

```
►►─┬─┬─ SHAre ─────┬─┬─ record-name ─┬──────────────────────────────────►
   │ └─ EXClusive ─┘ ├─ set-name   ─┤                                   │
   │                 └─ area-name   ─┘                                   │
   └─ UPgrade ─┬─ SHAre     ─┬─┬──────────────────────────────────────┬─┘
               └─ EXClusive ─┘ └─ REturn notification into return-location ─┘

►──────┬─ WAIT ────────┬──────────────────────────────────────────────►◄
       ├─ NOWAIT───────┤
       └─ NODEADLOCK ◄ ─┘
```

5.7 Message-Options

```
►►──┬─ TEXT ──┬─────┬──── message-text ──────────────────►
    │         ├─ IS ─┤
    │         └─ = ──┘
    └─ CODE ──┬─────┬──── message-code ──────────────────
              ├─ IS ─┤
              └─ = ──┘

►──────────────────────────────────────────────────────►
  ┌──────────────────────────────────────────────────┐
  │ └─ PARMS ──┬─────┬── (─┬─────────┬─┬── ) ──┘
  │            └─ = ─┘     ↓ parameter │
  │                        └─────────┘
  │
►──────────────────────────────────────────────────────►◄
  ┌──────────────────────────────────────────────────┐
  │ └─ PREFIX ──┬─────┬──── prefix ──────┘
  │             ├─ IS ─┤
  │             └─ = ──┘
```

5.8 Page-Specification

```
►►─┬─ PAGE-INFO ─┬─────┬─ page-info-variable ─┬──────────────────────►◄
   │             ├─ IS ─┤                      │
   │             └─ = ──┘                      │
```

5.9 Arithmetic-Expression

```
                          ┌─ + ─┐
                          ├─ - ─┤
                          ├─ * ─┤
                          └─ / ─┘
►►──┬──────────────┬──┬─ arithmetic-function ──────────────┬──────────────►◄
    │              │  ├─ variable-name ────────────────────┤
    └─ - ─┘        │  ├─ numeric-constant ─────────────────┤
                   │  ├─ system-supplied-data-field-name ──┤
                   │  └─ arithmetic-expression ────────────┘
```

Evaluation of Arithmetic Expressions: Arithmetic expression are evaluated according to the following rules:

- Expressions within parentheses are evaluated first. Within nested parentheses, evaluation proceeds from the innermost to the outermost set of parentheses.
- If the order of evaluation of an expression or of an embedded expression is not specified explicitly by parentheses, the following order of evaluation is implied:
  1. Unary plus, unary minus, and built-in functions, from left to right
  2. Multiplication and division, from left to right
  3. Addition and subtraction, from left to right

5.10 Variables

User-Defined Data Field Name

```
►►──┬─────┬─ + ◄ ─┬── data-field-name ──────────────────────────────►
    └─ - ─┘       │
                  │
►─┬──────────────────────────────────────────────────────────────────►
  │                                                                  │
  │  ┌─ OF ─┐   ┌── sql-table-name ──────────────────────────────┐   │
  │  └─ IN ─┘   ├── lr-name ─────────────────────────────────────┤   │
  │             │  ┌── record-name ─┐  ┌──────────────────────┐  │   │
  │             └──┤                ├──┤                      ├──┘   │
  │                └── role-name ───┘  │  ┌─ OF ─┐   lr-name ─┘  │   │
  │                                    └──┤      ├──────────────┘   │
  │                                       └─ IN ─┘                  │
  │                                                                  │
►─┼──────────────────────────────────────────────────────────────────┼►◄
  │                                                                  │
  │      ┌──────── , ────────┐                                       │
  └── (──┴──↓── subscript ────┴──)──────────────────────────────────┘
```

System-Supplied Data Field Name

```
►►──┬─────┬─ + ◄ ─┬── DIRECT-DBKEY ──────────────────────────────────►◄
    └─ - ─┘       │
                  ├── DB-NAME ────────────────────────────────────────┤
                  ├── NODE-NAME ──────────────────────────────────────┤
                  ├── agr-data-field ─────────────────────────────────┤
                  ├── amr-data-figure ────────────────────────────────┤
                  ├── $RESPONSE ──────────────────────────────────────┤
                  ├── $PAGE ──────────────────────────────────────────┤
                  ├── LENGTH (map-field-name) ────────────────────────┤
                  ├── CURSOR-ROW ─────────────────────────────────────┤
                  ├── CURSOR-COLUMN ──────────────────────────────────┤
                  ├── ERROR-STATUS ───────────────────────────────────┤
                  ├── JULIAN ─────────────────────────────────────────┤
                  ├── JULIANX ────────────────────────────────────────┤
                  ├── DATE ───────────────────────────────────────────┤
                  ├── DATEX ──────────────────────────────────────────┤
                  ├── TIME ───────────────────────────────────────────┤
                  ├─┬── $ERROR-COUNT ─┬──────────────────────────────┤
                  │ └── $ERRCNT ──────┘                              │
                  ├─┬── $INPUT-COUNT ─┬──────────────────────────────┤
                  │ └── $INCNT ───────┘                              │
                  └─┬── $OUTPUT-COUNT ─┬─────────────────────────────┘
                    └── $OUTCNT ───────┘
```

Chapter 6. System-Supplied Functions

ABSOLUTE-VALUE

```
►►─┬─ ABSOLUTE-VALUE ─┬─ ( value ) ──────────────────────────►◄
   └─ ABS-val ────────┘
```

ARC COSINE

```
►►─┬─ ARCCOSINE-DEGREES ─┬─ ( value ) ──────────────────────────►◄
   ├─ ARCCOSDEG ─────────┤
   └─ ACOSD ─────────────┘

►►─┬─ ARCCOSINE-RADIANS ─┬─ ( value ) ──────────────────────────►◄
   ├─ ARCCOSRAD ─────────┤
   └─ ACOSR ─────────────┘
```

ARC SINE

```
►►─┬─ ARCSINE-DEGREES ─┬─ ( value ) ──────────────────────────►◄
   ├─ ARCSINDEG ───────┤
   └─ ASIND ───────────┘

►►─┬─ ARCSINE-RADIANS ─┬─ ( value ) ──────────────────────────►◄
   ├─ ARCSINRAD ───────┤
   └─ ASINR ───────────┘
```

ARC TANGENT

```
►►─┬─ ARCTAN-DEGREES ─┬─ ( value ) ──────────────────────────►◄
   ├─ ARCTANDEG ──────┤
   └─ ATAND ──────────┘

►►─┬─ ARCTAN-RADIANS ─┬─ ( value ) ──────────────────────────►◄
   ├─ ARCTANRAD ──────┤
   └─ ATANR ──────────┘
```

CONCATENATE

```
►►─┬─ CONCATENATE ─┬─ ( ─┬─────┬─┬─ string ─┬─ ) ──────────────►◄
   ├─ CONCAT ──────┤     └─ , ─┘ │          │
   └─ CON ─────────┘             └──────────┘
```

COSINE

```
►►─┬─ COSINE-DEGREES ─┬─ ( value ) ──────────────────────────►◄
   └─ COSDeg ─────────┘

►►─┬─ COSINE-RADIANS ─┬─ ( value ) ──────────────────────────►◄
   └─ COSRad ─────────┘
```

DATECHG

```
►►──┬─ DATECHG ─┬─ ( date, input-date-format, output-date-format ) ──────►◄
    └─ DATECHGX ─┘
```

Format 2

```
►►──┬─ GCDATE ──┬─ ( date ) ──────────────────────────────────────────►◄
    ├─ GCDATEX ─┤
    ├─ GEDATE ──┤
    ├─ GEDATEX ─┤
    ├─ GJDATE ──┤
    ├─ GJDATEX ─┤
    ├─ CGDATE ──┤
    ├─ CGDATEX ─┤
    ├─ CEDATE ──┤
    ├─ CEDATEX ─┤
    ├─ CJDATE ──┤
    ├─ CJDATEX ─┤
    ├─ EGDATE ──┤
    ├─ EGDATEX ─┤
    ├─ ECDATE ──┤
    ├─ ECDATEX ─┤
    ├─ EJDATE ──┤
    ├─ EJDATEX ─┤
    ├─ JGDATE ──┤
    ├─ JGDATEX ─┤
    ├─ JCDATE ──┤
    ├─ JCDATEX ─┤
    ├─ JEDATE ──┤
    └─ JEDATEX ─┘
```

DATEDIF

```
►►──┬─ DATEDIF ─┬─ ( gregorian-date-1, gregorian-date-2 ) ──────────────►◄
    └─ DATEDIFX ─┘
```

DATEOFF

```
►►──┬─ DATEOFF ─┬─ ( gregorian-date, offset ) ──────────────────────────►◄
    └─ DATEOFFX ─┘
```

EXTRACT

```
►►── EXTract ( string ) ──────────────────────────────────────────────►◄
```

FIX

```
►►──┬─ FIX20 ─┬─ ( string ) ──────────────────────────────────────────►◄
    ├─ FIX40 ─┤
    ├─ FIX60 ─┤
    └─ FIX80 ─┘
```

GOODDATE

```
►►─┬─ GOODDATE ─┬─ ( date, date-format ) ──────────────────────────►◄
   └─ GOODDATEX ─┘
```

GOODTRAILING

```
►►─┬─ GOODTRAILING ─┬─ ( value ) ──────────────────────────────────►◄
   └─ GOODTRL ──────┘
```

INITCAP

```
►►── INITCAP ( string ) ──────────────────────────────────────────►◄
```

INSERT

```
►►── INSert ( string, insertion-string, starting-position ) ────────►◄
```

INVERT-SIGN

```
►►─┬─ INVERT-SIGN ─┬─ ( value ) ──────────────────────────────────►◄
   └─ INVert ──────┘
```

LEFT-JUSTIFY

```
►►─┬─ LEFT-JUSTIFY ─┬─ ( string ) ──────────────────────────────────►◄
   ├─ LEFT-just ────┤
   └─ LEFJUS ───────┘
```

LIKE

```
►►── LIKE ( string, search-string ─┬──────────────────────┬─ ) ────►◄
                                   └─ ,escape-character ──┘
```

LOGARITHM

```
►►─┬─ LOG-BASE-10 ─┬─ ( value ) ──────────────────────────────────►◄
   ├─ COMLOG ──────┤
   ├─ LOGCOM ──────┤
   └─ LOG10 ───────┘

►►─┬─ LOG-BASE-E ─┬─ ( value ) ──────────────────────────────────►◄
   ├─ NATLOG ─────┤
   ├─ LOGNAT ─────┤
   └─ LOGE ───────┘
```

MODULO

```
►►── MODulo ( dividend, divisor ) ──────────────────────────────►◄
```

NEXT-INT-EQHI

```
►►─┬─ NEXT-INT-EQHI ─┬─ ( value ) ──────────────────────────────►◄
   ├─ NEXTINTEH ─────┤
   └─ NEXIH ─────────┘
```

NEXT-INT-EQLO

```
►►─┬─ NEXT-INT-EQLO ─┬─ ( value ) ──────────────────────────────►◄
   ├─ NEXTINEL ──────┤
   └─ NEXIL ─────────┘
```

NUMERIC

```
►►── NUMERIC ( value ) ────────────────────────────────────────►◄
```

RANDOM-NUMBER

```
►►─┬─ RANDOM-NUMBER ─┬─ ( random-number-seed ) ─────────────────►◄
   └─ RANdom ────────┘
```

REPLACE

```
►►── REPlace ── ( string, search-string ─┬──────────────────────┬─ ) ──►◄
                                         └─ ,replacement-string ─┘
```

RIGHT-JUSTIFY

```
►►─┬─ RIGHT-JUSTify ─┬─ ( string ) ─────────────────────────────►◄
   └─ RIGHTjus ──────┘
```

SIGN-VALUE

```
►►─┬─ SIGN-VALue ─┬─ ( value ) ──────────────────────────────────►◄
   └─ SIGV ───────┘
```

SINE

```
►►─┬─ SINE-DEGREES ─┬─ ( value ) ──────────────────────────────►◄
   ├─ SINEDEG ──────┤
   └─ SIND ─────────┘

►►─┬─ SINE-RADIANS ─┬─ ( value ) ──────────────────────────────►◄
   ├─ SINERAD ──────┤
   └─ SINR ─────────┘
```

SQUARE-ROOT

```
►►─┬─ SQUARE-ROOT ─┬─ ( value ) ──────────────────────────────►◄
   └─ SQRT ────────┘
```

STRING-INDEX

```
►►─┬─ STRING-INDEX ─┬─ ( string, search-string ) ──────────────►◄
   ├─ INDEX ────────┤
   └─ INDX ─────────┘
```

STRING-LENGTH

```
►►─┬─ STRING-LENGTH ─┬─ ( string ) ─────────────────────────────►◄
   └─ SLENgth ───────┘
```

STRING-REPEAT

```
►►─┬─ STRING-REPEAT ─┬─ ( string, repetitions ) ────────────────►◄
   └─ SREPeat ───────┘
```

SUBSTRING

```
►►─┬─ SUBSTRING ─┬─ ( string, starting-position ─┬──────────────┬─ ) ──────►◄
   └─ SUBStr ────┘                               └─ ,length ────┘
```

TANGENT

```
►►─┬─ TANGENT-DEGREES ─┬─ ( value ) ──────────────────────────────────────►◄
   └─ TANDeg ──────────┘

►►─┬─ TANGENT-RADIANS ─┬─ ( value ) ──────────────────────────────────────►◄
   └─ TANRad ──────────┘
```

TODAY

```
►►─┬─ TODAY ─┬─ ( date-format ) ────────────────────────────────────────►◄
   └─ TODAYX ─┘
```

TOLOWER

```
►►── TOLOWER ( string ) ──────────────────────────────────────────────────►◄
```

TOMORROW

```
►►─┬─ TOMORROW ─┬─ ( date-format ) ────────────────────────────────────►◄
   └─ TOMORROWX ─┘
```

TOUPPER

```
►►── TOUPPER ( string ) ──────────────────────────────────────────────────►◄
```

TRAILING-TO-ZONED

```
►►─┬─ TRAILING-TO-ZONED ─┬─ ( value ) ──────────────────────────────────►◄
   └─ TRAILZN ───────────┘
```

TRANSLATE

```
►►── TRANSlate ( string, substitution-string ─┬──────────────────────┬─ ) ─►◄
                                               └─ ,selection-string ──┘
```

VERIFY

```
►►── VERify ( string, verification-string ) ──────────────────────────────►◄
```

WEEKDAY

```
►►─┬─ WEEKDAY ─┬─ ( date, date-format ) ──────────────────────────────►◄
   └─ WEEKDAYX ─┘
►►─┬─ GWEEKDAY ─┬─ ( date ) ──────────────────────────────────────────►◄
   ├─ GWEEKDAYX ─┤
   ├─ CWEEKDAY ──┤
   ├─ CWEEKDAYX ─┤
   ├─ EWEEKDAY ──┤
   ├─ EWEEKDAYX ─┤
   ├─ JWEEKDAY ──┤
   └─ JWEEKDAYX ─┘
```

WORDCAP

```
►►── WORDCAP ( string ) ──────────────────────────────────────────►◄
```

YESTERDAY

```
►►┬─ YESTERDAY ─┬─ ( date-format ) ──────────────────────────────►◄
  └─ YESTERDAYX ─┘
```

ZONED-TO-TRAILING

```
►►┬─ ZONED-TO-TRAILING ─┬─ ( value ) ──────────────────────────────►◄
  └─ ZNTRAIL ───────────┘
```

Chapter 7. Process Commands

7.1 Process Command Summary

Category	Keywords	Purpose
Arithmetic and assignment commands 7.2, “Arithmetic and Assignment Commands” on page 7-6.	ADD	Calculates the sum of two values.
	COMPUTE	Evaluates an arithmetic expression.
	DIVIDE	Calculates the quotient of two values.
	MOVE	Moves a value to a target field.
	MULTIPLY	Calculates the product of two values.
	SUBTRACT	Calculates the difference between two values.
Conditional commands 7.3, “Conditional Commands” on page 7-8.	EXIT	Terminates a WHILE command.
	IF	Performs conditional execution.
	NEXT	Terminates an IF command.
	WHILE	Iterates a loop based on a condition.
Control commands 7.4, “Flow of Control Commands” on page 7-9.	CONTINUE	Terminates a current process and executes a dialog's premap process.
	DISPLAY	Displays a dialog's map or reexecutes a dialog's premap process.
	EXECUTE NEXT FUNCTION	Directs the flow of control in an application defined by the application compiler.
	INVOKE	Passes control to a lower level dialog.
	LEAVE	Terminates a CA-ADS application.
	LINK	Passes control to a lower level dialog or to a user program with inline return expected.

Category	Keywords	Purpose
	READ TRANSACTION	Terminates a current process, performs a mapin operation, and selects the next function or response process to be executed.
	RETURN	Returns control to a higher level dialog.
	TRANSER	Passes control to a dialog at the same level.
	WRITE TRANSACTION	Terminates a current process, performs a mapout operation, and passes control within an application (batch only).
Database commands 7.5, “Navigational DML” on page 7-11.	ACCEPT	Retrieves database keys, page information, and database access statistics for navigationally accessed records.
	BIND PROCEDURE	Establishes communication between a dialog and a DBA-written procedure.
	COMMIT	Writes checkpoints to the journal file and releases record locks for navigationally accessed records.
	CONNECT	Connects records in navigationally accessed sets.
	DISCONNECT	Disconnects records from navigationally accessed sets.
	ERASE	Erases database records.
	FIND	Locates navigationally accessed records in the database.
	GET	Retrieves navigationally accessed records from the database.
	KEEP	Places locks on navigationally accessed records.
	MODIFY	Modifies database records.
	OBTAIN	Locates and retrieves database records.
	ON	Performs conditional execution based on the outcome of LRF command execution.

Category	Keywords	Purpose
	READY	Specifies an area usage mode for navigational database access.
	RETURN DB-KEY	Retrieves index entries associated with navigationally accessed database records.
	ROLLBACK	Requests recovery operations for navigationally accessed records.
	STORE	Stores database records.
Map commands 7.7, “Map Commands” on page 7-16.	Attributes	Alters map field attributes (an alternative format to MODIFY MAP).
	CLOSE	Closes a dialog's input or output file maps (batch only).
	GET DETAIL	Retrieves a modified detail occurrence of a pageable map.
	MODIFY MAP	Alters the options specified for the dialog's map.
	PUT DETAIL	Creates or modifies a detail occurrence of a pageable map.
Queue and scratch management commands 7.9, “Queue and Scratch Management Commands” on page 7-20.	DELETE QUEUE	Deletes queue records.
	GET QUEUE	Retrieves queue records.
	PUT QUEUE	Stores queue records.
	DELETE SCRATCH	Deletes scratch records.
	GET SCRATCH	Retrieves scratch records.
	PUT SCRATCH	Stores scratch records.
Subroutine commands 7.10, “Subroutine Control Commands” on page 7-23.	CALL	Passes control to a predefined subroutine.
	DEFINE	Defines a subroutine.

Category	Keywords	Purpose
	GOBACK	Returns control from a subroutine.
Utility commands 7.11, “Utility Commands” on page 7-24.	ABORT	Causes the runtime system to abort the application.
	ACCEPT	Retrieves runtime status information associated with the current dialog.
	INITIALIZE RECORDS	Reinitializes a dialog's record buffers.
	SNAP	Requests a snapshot dump of the areas in memory associated with CA-ADS.
	WRITE PRINTER	Transmits data from a dialog to a CA-IDMS/DC or CA-IDMS/UCF queue for subsequent printing.
	WRITE TO LOG/OPERATOR	Sends a message to the log file or to the operator's console (batch only).

7.2 Arithmetic and Assignment Commands

ADD

```
►►── ADD arithmetic-expression to variable ── options ─ . ──────────►◄
```

Expansion of options

```
►──┬──────────────────────────────┬──────────────────────────────►◄
   ├─ ROUNDED ────────────────────┤
   ├─ TRUNCATED ──────────────────┤
   └─ ALLOWING assignment-condition ─┘
```

COMPUTE

```
►►── COMPUTE variable ─ options ─ - = - arithmetic-expression ─ . ──►◄
```

Expansion of options

```
►──┬──────────────────────────────┬──────────────────────────────►◄
   ├─ ROUNDED ────────────────────┤
   ├─ TRUNCATED ──────────────────┤
   └─ ALLOWING assignment-condition ─┘
```

DIVIDE

```
►►── DIVIDE divisor into dividend ──────────────────────────────────►
►──┬──┬──────────────────────────────┬──────────────────────────┬── . ──►◄
   │  ├─ ROUNDED ────────────────────┤                          │
   │  ├─ TRUNCATED ──────────────────┤                          │
   │  └─ ALLOWING assignment-condition ─┘                          │
   └─ GIVING quotient ─┬──────────────┬─┬──────────────────────┬─┘
                       ├─ ROUNDED ────┤ └─ REMAINDER remainder ─┘
                       └─ TRUNCATED ──┘
```

MOVE

```
►►── MOVE value to variable ─ options ─ . ──────────────────────────►◄
```

Expansion of options

```
►──┬──────────────────────────────┬──────────────────────────────►◄
   ├─ ROUNDED ────────────────────┤
   ├─ TRUNCATED ──────────────────┤
   └─ ALLOWING assignment-condition ─┘
```

MULTIPLY

```
►►── MULTIPLY arithmetic-expression by variable ─ options ─ . ──────►◄
```

Expansion of options

```
►──┬──────────────────────────────┬──────────────────────────────►◄
   ├─ ROUNDED ────────────────────┤
   ├─ TRUNCATED ──────────────────┤
   └─ ALLOWING assignment-condition ─┘
```

SUBTRACT

```
►►── SUBTRACT arithmetic-expression from variable ─ options ─ . ──────►◄
```

Expansion of options

```
►──┬──────────────────────────────┬──────────────────────────────────►◄
   ├─ ROUNDED ────────────────────┤
   ├─ TRUNCATED ──────────────────┤
   └─ ALLOWING assignment-condition ─┘
```

7.3 Conditional Commands

EXIT

```
►►── EXIT ── . ──────────────────────────────────────────────►◄
```

IF

```
►►── IF conditional-expression ──────────────────────────────►
 ►── then ──┬─ command-statement. ──────────────────────────►
           └─ DO. ─┬─↓─ command-statement. ─┬─ END. ─┘
                   └────────────────────────┘
 ►──┬──────────────────────────────────────────────────────►◄
    └─ ELSE ──┬─ command-statement. ──────────────────────┬─┘
              └─ DO. ─┬─↓─ command-statement. ─┬─ END. ─┘
                      └────────────────────────┘
```

NEXT

```
►►── NEXT command ── . ────────────────────────────────────────►◄
```

WHILE

```
►►── WHILE conditional-expression ──────────────────────────►
 ►── repeat. ──┬─↓─ command-statement. ─┬── END. ──────────►◄
              └────────────────────────┘
```

7.4 Flow of Control Commands

CONTINUE

```
►►── CONtinue ──┬──────────────────────────────┬── . ──────────────►◄
                │                              │
                └─┬─ MESSage ─┬─ message-options ─┘
                  └─ MSG ─────┘
```

DISPLAY

```
►►── DISPlay ──┬──────────┬──┬──────────────────────────────────────┬── . ─►◄
               └─ NOSAVE ─┘  │                                      │
                             ├─ ERASe ──────────────────────────────┤
                             │                                      │
                             └─ CONTinue ──┬──────────────────────┬─┘
                                           │                      │
                                           └─┬─ MESSAGE ─┬─ message-options ─┘
                                             └─ MSG ─────┘
```

EXECUTE NEXT FUNCTION

```
►►── EXECute next function ── . ──────────────────────────────────►◄
```

INVOKE

```
►►── INVoke ──┬──────────┬── dialog-name ── . ──────────────────►◄
               └─ NOSAVE ─┘
```

LEAVE

```
►►── LEAVE ──┬──────────────────────────────────────────────────────►─
              │
              ├─ APPLication ◄ ──┬──────────────────────────────────┬
              │                  │                                  │
              │                  └─ NEXT ──┬─ TASK - task-code ─────┬┤
              │                            │                        │
              │                            └─ dialog ◄ - dialog-name┘
              │
              └─ ADS/online ──┬──────────────────────────────────┬
                              │                                  │
                              └─ NEXT TASK dc-task-code ─────────┘

─►──────────────────────────────────────────────────────────┬── . ──►◄
  ────────────────────────────────────────────────────────┤
  ────────────────────────────────────────────────────────┤
  └─ CONDition code ──┬──────────┬── condition-code ──┘
                      ├─ IS ─────┤
                      └─ = ──────┘
```

LINK

```
►►── LINK ──┬──────────┬── to ──┬──┬──────────────────┬── dialog-name ──►
             └─ NOSAVE ─┘        │  └─ DIALOG ──┬─ IS ─┬┘
                                 │              └─ = ───┘
                                 └─ PROGram ──┬──────────┬── program-name ──►
                                   PGM ───────┘  ├─ IS ─┤
                                                 └─ = ──┘

►──┬──────────────────────────────────────────────────────────┬── . ──►◄
   │                                                          │
   └─ USING ( control-options ) ──────────────────────────────┘
   │
   │
   └─ USING ( control-options ─┬─ record-name ─┬─ ) ──┘
                               ↓               │
                               ◄───────────────┘
```

READ TRANSACTION

```
►►── READ TRANsaction ──┬──────────┬── . ──────────────►◄
                       └─ OUTput ─┘
```

RETURN

```
►►── RETurn ──┬──────────────────┬──┬──────────┬──┬──────────┬── . ──►◄
             ├─ TO dialog-name ─┤  ├─ CLEAR ──┤  └─ CONTinue ─┘
             └─ to ─┬─ TOP ────┬─┘  └─ CLR ───┘
                    └─ ALL ────┘
```

TRANSFER

```
►►── TRANsfer ──┬──────────┬── to dialog-name ── . ──────────►◄
               └─ NOFinish ─┘
```

WRITE TRANSACTION

```
►►── WRITE TRANsaction ──┬──────────────┬──────────────────────►◄
                        └─ to SUSpense ─┘

►──┬──────────────────────────────────────────────────────────┬──►
   ├─ CONTinue ──────────────────────────────────────────────┤
   └─ RETurn ──┬──────────────────┬──┬──────────┬──┬──────────┬─┘
               ├─ TO dialog-name ─┤  ├─ CLEAR ──┤  └─ CONTinue ─┘
               └─ to TOP ─┬─────┬─┘  └─ CLR ───┘
                          └─ ALL ─┘

►──┬──────────────────────────────┬── . ──────────────────────►◄
   └─ MESSAGE ─┬─────────────────┬─┘
               └─ MSG ───────────┘
```

message-options

7.5 Navigational DML

ACCEPT DB-KEY

```
►►── ACCept DB-KEY into db-key-variable FROM ┬──────────────┬──────────►
                                             ├─ record name ─┤
                                             ├─ set-name ────┤
                                             └─ area-name ───┘

►── CURRENCY ──┬──────────────────────┬── . ──────────────────────►◄
               └─ error-expression ─┘

►►── ACCept DB-KEY into db-key-variable FROM set-name ──────────────►

►┬─ NEXT ──┬── CURRENCY ──┬──────────────────────┬── . ──────────►◄
 ├─ PRIOR ─┤              └─ error-expression ─┘
 └─ OWNER ─┘
```

ACCEPT PAGE-INFO

```
►►─ ACCept PAGE-INFO into page-info-variable FOR record-name ──────►

►──┬──────────────────────┬── . ──────────────────────────────────►◄
   └─ error-expression ─┘
```

ACCEPT STATISTICS

```
►►── ACCept ─┬─ STATISTICS ─┬── into db-statistics-variable ──────►
            └─ STATS ──────┘

►── FROM IDMS-STATISTICS ── . ──────────────────────────────────────►◄
```

BIND PROCEDURE

```
►►── BIND PROCedure for procedure-name TO ──────────────────────────►

►── procedure-control-location ──┬──────────────────────┬── . ──►◄
                                └─ error-expression ─┘
```

COMMIT

```
►►── COMMIT ──┬─────────┬──┬─────────┬── . ──────────────────────►◄
             └─ TASK ─┘  └─ ALL ─┘
```

CONNECT

```
►►── CONNECT record-name TO set-name ──┬──────────────────────┬── . ──►◄
                                       └─ error-expression ─┘
```

DISCONNECT

```
►►── DISCONNECT record-name FROM set-name ──┬──────────────────────┬── . ──►◄
                                            └─ error-expression ─┘
```

ERASE

```
►►── ERASE record-name ──┬──────────────────────────────────────────────────►◄
                         └─ PERMANENT ─┬─ MEMBERS ─┘
                            ├─ SELECTIVE ─┤
                            └─ ALL ───────┘

►──┬──────────────────────────┬──── . ────────────────────────────────────►◄
   └─ error-expression ─┘
```

FIND/OBTAIN CALC/DUPLICATE

```
►►──┬─ FIND ─┬──┬──────────────────────────────────────────────────────►
    └─ OBTAIN ─┘  └─ KEEP ──┬──────────────┬──┘
                            └─ EXCLUSIVE ─┘

►──┬──┬─ CALC ─┬──┬──── record-name ──┬──────────────────────┬── . ──────►◄
   │  └─ ANY ──┘  │                   └─ error-expression ─┘
   └─ DUPLICATE ─┘
```

FIND/OBTAIN CURRENT

```
►►──┬─ FIND ─┬──┬──────────────────────────────────────────────────────►
    └─ OBTAIN ─┘  └─ KEEP ──┬──────────────┬──┘
                            └─ EXCLUSIVE ─┘

►── CURRENT ──┬──────────────────────┬──┬──────────────────────────┬── . ──►◄
              ├─ record name ────────┤  └─ error-expression ─┘
              ├─ WITHIN set-name ────┤
              └─ WITHIN area-name ───┘
```

FIND/OBTAIN DB-KEY

```
►►──┬─ FIND ─┬──┬──────────────────────────────────────────────────────►
    └─ OBTAIN ─┘  └─ KEEP ──┬──────────────┬──┘
                            └─ EXCLUSIVE ─┘

►──┬─ DB-KEY ──┬──────────┬── db-key-variable ──┬──────────────────────┬──►
   │           ├─ IS ─────┤                     └─ page-specification ─┘
   │           └─ = ──────┘
   └──────────────────────┬── DB-KEY ──┬──────────┬── db-key-variable ──┘
                          └─ record name ─┘          ├─ IS ─────┤
                                                     └─ = ──────┘

►──┬──────────────────────────┬──────────────────────────────────── . ──►◄
   └─ error-expression ─┘
```

FIND/OBTAIN OWNER

```
►►──┬─ FIND ─┬──┬──────────────────────────────────────────────────────►
    └─ OBTAIN ─┘  └─ KEEP ──┬──────────────┬──┘
                            └─ EXCLUSIVE ─┘

►── OWNER WITHIN set-name ──┬──────────────────────────┬── . ──────────►◄
                            └─ error-expression ─┘
```

FIND/OBTAIN WITHIN SET/AREA

```
►►─┬─ FIND ──┬──┬─────────────────────────────┬──────────────────────────────►
   └─ OBTAIN ─┘  └─ KEEP ──┬──────────────┬──┘
                          └─ EXCLUSIVE ──┘

►─┬─ NEXT ──────────┬──┬──────────────────┬── WITHIN ─┬─ set-name ──┬──────►
  ├─ PRIOR ─────────┤  └─ record-name ────┘           └─ area-name ─┘
  ├─ FIRST ─────────┤
  ├─ LAST ──────────┤
  └─ sequence-number┘

►──┬──────────────────────┬── . ──────────────────────────────────────────►◄
   └─ error-expression ───┘
```

FIND/OBTAIN WITHIN SET USING SORT KEY

```
►►─┬─ FIND ──┬──┬─────────────────────────────┬── record-name ──────────────►
   └─ OBTAIN ─┘  └─ KEEP ──┬──────────────┬──┘
                          └─ EXCLUSIVE ──┘

►── WITHIN set-name ──┬──────────────┬──────────────────────────────────────►
                      └─ CURRENT ────┘

►── USING sort-field-name-variable ──┬──────────────────────────┬── . ──►◄
                                      └─ error-expression ───────┘
```

GET

```
►►── GET ──┬──────────────────┬──┬──────────────────────────┬── . ──────►◄
           └─ record-name ────┘  └─ error-expression ───────┘
```

KEEP

```
►►── KEEP ──┬──────────────┬── CURRENT ──────────────────────────────────►
            └─ EXCLUSIVE ──┘

►─┬─ record-name ──────┬──┬──────────────────────────┬── . ──────────►◄
  ├─ WITHIN set-name ───┤  └─ error-expression ───────┘
  └─ WITHIN area-name ──┘
```

KEEP LONGTERM

```
►►── KEEP LONGterm ──┬─ ALL ──────────┬──────────────────────────────────►
                     └─ longterm-id ──┘

►─┬─ NOTIFY CURrent ──┬─ record-name ──┬──────────────────────────────┬──►
  │                   ├─ set-name ─────┤                              │
  │                   └─ area-name ────┘                              │
  ├─ TEST RETurn notification into return-location ──────────────────┤
  ├─ RELease ────────────────────────────────────────────────────────┤
  └─ lock-options ───────────────────────────────────────────────────┘

►──┬──────────────────────┬── . ──────────────────────────────────────────►◄
   └─ error-expression ───┘
```

MODIFY

```
►►── MODIFY record-name ──┬──────────────────────┬── . ──────────►◄
                          └─ error-expression ─┘
```

READY

```
►►── READY ──┬─ area-name ─┬──┬── USAGE-MODE ──┬─ IS ─┬──────────────►
           └─ ALL ◄ ────┘  │                │ = ─┘
                           │
►──┬──┬──┬─ PROTECTED ─┬──┬─ RETRIEVAL ◄ ─┬──┬──────────────────►◄
   │  │  └─ EXCLUSIVE ─┘  └─ UPDATE ─────┘  │
   │  │                                     │
   │  └─ NOREADY ──────────────────────────┘
   │
   └──────────────────────────────────────────────────────────────
```

RETURN DB-KEY

```
►►── RETURN DB-KEY into db-key-variable FROM index-set-name ──────►

►──┬─ CURRENCY ──────────────┬──┬──────────────────────┬── . ──────►◄
   ├─ FIRST currency ────────┤  └─ error-expression ─┘
   ├─ LAST currency ─────────┤
   ├─ NEXT currency ─────────┤
   ├─ PRIOR currency ────────┤
   └─ USING index-key-variable ─┘
```

ROLLBACK

```
►►── ROLLBACK ──┬─ TASK ─┬──┬─ CONTINUE ─┬── . ──────────►◄
               └────────┘  └────────────┘
```

STORE

```
►►──── STORE record-name--┬──────────────────────┬── . ──────────►◄
                          └─ error-expression ─┘
```

7.6 Logical Record Facility Commands

ERASE

```
►►── ERASE lr-name ──┬──────────────────────────────┬──────────►
                     └─ WHERE lr-conditional-expression ─┘

►──┬──────────────────────┬── . ──────────────────────────►◄
   └─ error-expression ─┘
```

MODIFY

```
►►── MODIFY lr-name ──┬──────────────────────────────┬──────────►
                     └─ WHERE lr-conditional-expression ─┘

►──┬──────────────────────┬── . ──────────────────────────►◄
   └─ error-expression ─┘
```

OBTAIN

```
►►── OBTAIN ──┬─ FIRST ─┬── lr-name ──────────────────────────►
              └─ NEXT ◄ ─┘

►──┬──────────────────────────────────┬──┬──────────────────────┬── . ──►◄
   └─ WHERE lr-conditional-expression ─┘  └─ error-expression ─┘
```

ON

```
►►── ON path-status ──┬─ REPEAT. ──┬─┬─↓─ command-statement. ─┬─┬── END. ──────►
                      │             │ │                        │ │
                      │             │ └────────────────────────┘ │
                      └─ THEN ──┬── command-statement. ──────────┬─┬
                                │                                 │ │
                                └─ DO. ──┬─┬─↓─ command-statement. ─┬─┬── END. ─┘ │
                                         │ │                        │ │
                                         │ └────────────────────────┘ │

►──┬──────────────────────────────────────────────────────────────────┬──►◄
   │                                                                  │
   └─ ELSE ──┬── command-statement. ──────────────────────────────────┬─┘
             │                                                        │
             └─ DO. ──┬─┬─↓─ command-statement. ─┬─┬── END. ──────────┬─┘
                      │ │                        │ │                  │
                      │ └────────────────────────┘ │
```

STORE

```
►►── STORE lr-name ──┬──────────────────────────────┬──────────►
                     └─ WHERE lr-conditional-expression ─┘

►──┬──────────────────────┬── . ──────────────────────────►◄
   └─ error-expression ─┘
```

7.7 Map Commands

Attributes Command

```
►►──┬─ BRIGHTen ──┬──────────────────────────────────────────────────►
    ├─ DARKen ────┤
    ├─ NORMALize ─┤
    ├─ PROTect ───┤
    └─ UNPROTect ─┘

►──┬──────────────────────────────────┬──── CURrent ────────────────┬──────────────────────►
   │  ┌──────────────────────────────┐│                             │
   │  └─ all ──┬─ BUT ────┬──────────┘│                             │
   │           └─ EXCept ─┘           │                             │
   ├─ ALL ──────┬──────────────────────┬──── FIELDS ─────────────────┤
   │            ├─ CORrect ────────────┤                             │
   │            └─ ERRor ──────────────┘                             │
   │                                  ┌──────────────────────────┐  │
   │                                  │                          │  │
   └─ all ──┬──────────────────────┬──┴──┬─ ( ─┬─↓─ field-name ─┬─┴─ ) ─┬──┘
            ├─ BUT ────────────────┤     ├─ FIELD ─┬─ field-name ─┤       │
            └─ EXCept ─────────────┘     └─ DFLD ──┘              │       │

►──┬─ PERManent ◄ ─┬──── . ──────────────────────────────────────────►◄
   └─ TEMPorary ───┘
```

CLOSE

```
►►── CLOSE ──┬─ BOTH ◄ ─┬──── file MAPs ──── . ──────────────────►◄
             ├─ INPUT ──┤
             └─ OUTPUT ─┘
```

MODIFY MAP

```
►►── MODIFY MAP ──────────┬─ PERManent ◄ ─┬──────────────────────────────►
                          └─ TEMPorary   ─┘

►─┬─────────────────────────────────────────────────┬─────────────────────►
  └─ CURSOR at ──┬─┬─ FIELD ─┬─ field-name ─────────┤
                 │ └─ DFLD ──┘                       │
                 └─ row, column ─────────────────────┘

►─┬──────────────────────────────┬────────────────────────────────────────►
  │      ┌─────────────────────┐ │
  └─ WCC ─↓─┬─┬─ RESETMDT ─┬─┬─┴─┘
            │ └─ NOMDT ────┘ │
            ├─┬─ RESETKBD ─┬─┤
            │ └─ NOKBD ────┘ │
            ├─┬─ ALARM ────┬─┤
            │ └─ NOALARM ──┘ │
            ├─┬─ STARTPRT ─┬─┤
            │ └─ NOPRT ────┘ │
            └─┬─ NLCR ─────┬─┘
              ├─ 40CR ─────┤
              ├─ 64CR ─────┤
              └─ 80CR ─────┘

►─┬───────────────────────────────────────────────────────────────────────►
  └─ FOR ─┬─┬──────────────────────┬── CURrent ────────────────┬─
          │ └─ all ─┬─ BUT ────────┤                           │
          │         └─ EXCept ─────┘                           │
          ├─ ALL ──────┬──────────────┬── FIELDS ──────────────┤
          │            ├─ CORrect ────┤                        │
          │            └─ ERRor ──────┘                        │
          │                              ┌───────────────┐     │
          └─ all ─┬───────────────┬─┬─ ( ─↓─ field-name ─┴─ ) ─┤
                  ├─ BUT ─────────┤ ├─ FIELD ─┬─ field-name ───┘
                  └─ EXCept ──────┘ └─ DFLD ──┘

►─────────────────────────────────────────────────────────────────────────►
 ─┬──────────────────┬──┬─────────────────────────────────────┬─
  ├─ BACKscan ───────┤  └─ OUTput DATA is ─┬─ Yes ────────────┤
  └─ NOBACKscan ─────┘                     ├─ No ─────────────┤
                                           ├─ ERASE ──────────┤
                                           └─ ATTribute ──────┘

►─────────────────────────────────────────────────────────────────────────►
 ─┬───────────────────────────────┬──┬─────────────────────────────┬─
  └─ INput DATA is ─┬─ Yes ───────┤  ├─┬─ Right ─┬─ JUSTify ───────┤
                    └─ No ────────┘  │ └─ Left ──┘                 │

►─────────────────────────────────────────────────────────────────────────►
 ─┬─────────────────────────────────┬──┬─────────────────────────────┬─
  ├─ PAD ─┬─ pad-character ───────┬─┤  └─ EDIT is ─┬─ CORrect ──────┤
  │       ├─ LOW-VALUE ───────────┤ │              └─ ERRor ────────┘
  │       └─ HIGH-VALUE ──────────┘ │
  └─ NOPAD ─────────────────────────┘

►─────────────────────────────────────────────────────────────────────────►
 ─┬────────────────┬──┬──────────────────────────────────────────────┬─
  ├─ REQuired ─────┤  └─ ERRor ─┬─ MESSAGE ─┬─ is ─┬─ ACTive ────────┤
  └─ OPTional ─────┘            └─ MSG ─────┘      └─ SUPpress ──────┘
```

```
►──────────────────────────────────────────────────────────────── . ────────────────►◄
│                                                                │
│                                                                │
└─ ATTRibutes ─┬──────────────────────────────────────────────┐
               │                                              │
               │  ┌──────────────────────────────────────────┐
               │  │                                          │
               │  │  ┌─ SKIP ──────────────────────────────┐ │
               │  │  │                                     │ │
               │  │  ├─┬─ ALPHAmeric ─┬──────────────────┤ │
               │  │  │ └─ NUMeric ────┘                    │ │
               │  │  ├─┬─ PROTected ────┬──────────────────┤ │
               │  │  │ └─ UNPROTected ──┘                  │ │
               │  │  ├─┬─ DISPlay ──────┬──────────────────┤ │
               │  │  │ ├─ DARK ─────────┤                  │ │
               │  │  │ └─ BRIGHT ───────┘                  │ │
               │  │  ├─── DETECTable ──────────────────────┤ │
               │  │  ├─┬─ MDT ──────────┬──────────────────┤ │
               │  │  │ └─ NOMDT ────────┘                  │ │
               │  │  ├─┬─ BLINK ────────┬──────────────────┤ │
               │  │  │ └─ NOBLINK ──────┘                  │ │
               │  │  ├─┬─ REVerse-video ─┬─────────────────┤ │
               │  │  │ └─ NORMal-video ──┘                 │ │
               │  │  ├─┬─ UNDERscore ────┬─────────────────┤ │
               │  │  │ └─ NOUNDERscore ──┘                 │ │
               │  │  └─┬─ NOColor ───────┬─────────────────┘ │
               │  │    ├─ BLUe ──────────┤                   │
               │  │    ├─ RED ───────────┤                   │
               │  │    ├─ PINk ──────────┤                   │
               │  │    ├─ GREen ─────────┤                   │
               │  │    ├─ TURquoise ─────┤                   │
               │  │    ├─ YELlow ────────┤                   │
               │  │    └─ WHIte ─────────┘                   │
               └──┴──────────────────────────────────────────┘
```

7.8 Pageable Map Commands

GET DETAIL

```
►►── GET DETail ┬──────────────────────────────────────────────────────────►
                │┌─ NEXt ◄ ─┐┌──────────────────────────────────────────┐
                │└─ FIRst ──┘└─ RETurn KEY into data-field-name-variable ─┘│
                └─ KEY ──────┬─────────────── key-number ────────────────┘
                             ├─ IS ─┤
                             └─ = ──┘

►──┬──────────────────────────────────────────┬── . ──────────────────────►◄
   ├─ ALL ◄ ──┬── FIElds ──┘
   └─ MODified ─┘
```

PUT DETAIL

```
►►── PUT ┬──────────────────────────────────────────────────────────────►
         ├─ NEW ◄ ──┬── DETail ──┬──────────────────────────────────────┤
         └─ CURRent ─┘            └─ KEY ──────┬──────── key-number ────┘
                                               ├─ IS ─┤
                                               └─ = ──┘

►──┬──────────────────────────────────────────┬── . ──────────────────────►◄
   └─ MESSAGE ──┬── message-options ──┘
     └─ MSG ────┘
```

7.9 Queue and Scratch Management Commands

DELETE QUEUE

```
►►── DELETE QUEUE ──┬──────────────────┬──┬─ ALL ──────────────┬──►
                   └─ ID queue-id ────┘  └─ CURRENT ◄ ────────┘

►──┬──────────────────────┬──── . ────────────────────────────►◄
   └─ error-expression ───┘
```

GET QUEUE

```
►►── GET QUEUE ──┬──────────────────┬──────────────────────────────►
                └─ ID queue-id ────┘

►──┬─ DELETE ◄ ──┬──┬─ NOWAIT ◄ ──┬──────────────────────────────►
   └─ KEEP ──────┘  └─ WAIT ──────┘

►── INTO return-queue-data-location-variable ──────────────────►

►──┬──────────────────────────────────────────┬──────────────────►
   ├─ TO end-queue-data-location-variable ────┤
   └─ MAX LENGTH queue-data-max-length ───────┘

►──┬─ FIRST ──────────────────────────┬──────────────────────────►
   ├─ LAST ───────────────────────────┤
   ├─ NEXT ◄ ─────────────────────────┤
   ├─ PRIOR ──────────────────────────┤
   ├─ SEQUENCE sequence-number ───────┤
   └─ RECORD ID queue-record-id ──────┘

►──┬──────────────────────────────────────────────────────────────┬──►
   └── RETURN LENGTH into queue-data-actual-length-variable ──────┘

►──┬──────────────────────┬──── . ────────────────────────────►◄
   └─ error-expression ───┘
```

PUT QUEUE

```
►►── PUT QUEUE ──┬──────────────────┬──┬─ LAST ◄ ────────────┬──►
                └─ ID queue-id ────┘  └─ FIRST ─────────────┘

►── FROM queue-data-location-variable ──────────────────────────►

►──┬──────────────────────────────────────────┬──────────────────►
   ├─ TO end-queue-data-location-variable ────┤
   └─ LENGTH queue-data-length ───────────────┘

►──┬── RETENTION is ──┬─ FOREVER ◄ ──────────┬──────────────────►
   │                  └─ queue-retention-period ─┘
   └

►──┬──────────────────────────────────────────────────────────────►
   └── RETURN RECORD ID into return-queue-id-variable ──────────┘

►──┬──────────────────────┬──── . ────────────────────────────►◄
   └─ error-expression ───┘
```

DELETE SCRATCH

```
►►── DELETE SCRATCH ──┬──────────────────────────────┬──────────────────►
                      └─ AREA ID scratch-area-id ────┘

►──┬─ CURRENT ◄ ──────────────────┬──────────────────────────────────►
   ├─ FIRST ──────────────────────┤
   ├─ LAST ───────────────────────┤
   ├─ NEXT ───────────────────────┤
   ├─ PRIOR ──────────────────────┤
   ├─ ALL ────────────────────────┤
   └─ RECORD ID scratch-record-id ┘

►──┬──────────────────────────────────────────────────────────────┬──►
   └─ RETURN RECORD ID into return-scratch-record-id-variable ────┘

►──┬──────────────────────────┬──── . ────────────────────────────►◄
   └─ error-expression ───────┘
```

GET SCRATCH

```
►►── GET SCRATCH ──┬──────────────────────────────┬──────────────────►
                   └─ AREA ID scratch-area-id ────┘

►──┬─ DELETE ◄ ──┬──── INTO return-scratch-data-location-variable ──►
   └─ KEEP ──────┘

►──┬──────────────────────────────────────────┬──────────────────►
   ├─ TO end-scratch-data-location-variable ──┤
   └─ MAX LENGTH scratch-data-max-length ─────┘

►──┬─ CURRENT ────────────────────┬──────────────────────────────────►
   ├─ FIRST ──────────────────────┤
   ├─ LAST ───────────────────────┤
   ├─ NEXT ◄ ─────────────────────┤
   ├─ PRIOR ──────────────────────┤
   └─ RECORD ID scratch-record-id ┘

►──┬──────────────────────────────────────────────────────────────┬──►
   └─ RETURN LENGTH into scratch-data-actual-length-variable ──────┘

►──┬──────────────────────────┬──── . ────────────────────────────►◄
   └─ error-expression ───────┘
```

PUT SCRATCH

```
►►── PUT SCRATCH ──┬──────────────────────────────┬──────────────────────►
                   └─ AREA ID scratch-area-id ────┘

►── FROM scratch-data-location-variable ──────────────────────────────────►

►──┬──────────────────────────────────────────┬──────────────────────────►
   ├─ TO end-scratch-data-location-variable ──┤
   └─ LENGTH scratch-data-length ─────────────┘

►──┬──────────────────────────────────────────┬──────────────────────────►
   └─ RECORD ID scratch-record-id ──┬──────────┬┘
                                    └─ REPLACE ─┘

►──┬──────────────────────────────────────────────────────────────────────┬►
   └─ RETURN RECORD ID into return-scratch-record-id-variable ────────────┘

►──┬──────────────────────────┬──────── . ──────────────────────────────►◄
   └─ error-expression ───────┘
```

7.10 Subroutine Control Commands

CALL

```
►►── CALL subroutine-name ── . ──────────────────────────────►◄
```

DEFINE

```
                                   ┌──────────────────────┐
►►── DEFINE subroutine subroutine-name ── . ──┬──↓── command statement. ──┴──►◄
```

GOBACK

```
►►── GOBACK ── . ──────────────────────────────────────────►◄
```

7.11 Utility Commands

ABORT

```
►►── ABORT ──┬──────────┬──┬──────────────────────────────────────────┬──►◄
           └─ SNAP ─┘  └─┬─ MESSage ─┬─ message-options ─┘
                         └─ MSG ─────┘
```

ACCEPT

```
►►─ ACCept ──┬──┬─ TASK CODE ──────────┬─ INTO location ──┬── . ──────────►◄
             │  ├─ TASK ID ────────────┤                  │
             │  ├─ LTERM ID ───────────┤                  │
             │  ├─ PTERM ID ───────────┤                  │
             │  ├─ SYSVERSION ─────────┤                  │
             │  ├─ USER ID ────────────┤                  │
             │  ├─ current DIALOG name ┤                  │
             │  ├─ HIGHER DIALOG name  ┤                  │
             │  ├─ RECORD name ────────┤                  │
             │  ├─ AREA name ──────────┤                  │
             │  ├─ ERROR SET name ─────┤                  │
             │  ├─ ERROR RECORD name ──┤                  │
             │  ├─ ERROR AREA name ────┤                  │
             │  └─┬─ RUN PARameters ─┬─┘                  │
             │    └─ PARMS ──────────┘                    │
             │                                            │
             └─ SCREEN SIZE INTO location1  location2 ────┘
```

INITIALIZE RECORDS

```
►►── INITialize records ──┬─ ALL ──────────────────────┬── . ──────────►◄
                          └─ ( ─┬─ record-name ─┬─ ) ─┘
                                ↓               ↑
```

SNAP

```
►►── SNAP ──┬──┬──┬──┬─ ALL ──────────────────────────────────────────────►
           ↓  │  │  │                                                    │
           │  │  │  └─┬─ OCB ──┬──┘                                      │
           │  │  │    ↓        ↑                                         │
           │  │  │    ├─ OWA ──┤                                         │
           │  │  │    ├─ OTB ──┤                                         │
           │  │  │    ├─ OTBX ─┤                                         │
           │  │  │    ├─ FDB ──┤                                         │
           │  │  │    ├─ VDB ──┤                                         │
           │  │  │    ├─ RBB ──┤                                         │
           │  │  │    ├─ ADB ──┤                                         │
           │  │  │    └─ TAT ──┘                                         │
           │  │  └─ RECORDs - ( ─┬─ record-name ─┬─ ) ─┘                 │
           │  │                  ↓               ↑                      │
           │  └─ TITLE ──┬──────────┬── 'title-text' ──┘                 │
           │             ├─ IS ─────┤                                    │
           │             └─ = ──────┘                                    │
           ►──────────────────────────────────────────────────────── . ──►◄
```

TRACE

```
►►── TRACE ─┬─────────┬──────────────────────────────────────────►◄
          ├─ ALL ◄─┤
          ├─ CTL ──┤
          └─ OFF ──┘
```

WRITE PRINTER

```
►►── WRITE PRINTER ─┬──────────┬──┬──────────┬──────────────────────►
                   └─ ERASE ──┘  └─ ENDRPT ─┘
                   └─ NEWPAGE ─┘

►──┬─ SCREEN CONTENTS ──────────────────────────────────────────►
   │                   ┌──────────────────────────────────────────
   └─ NATIVE ─┘ FROM message-location-variable ──────────────────

►──────────────────────────────────────────────────────────────►
   ┌──────────────────────────────────────────────────────────────
   ├─ TO end-message-location-variable ─┤
   └─ LENGTH message-length ────────────┘

►──┬──────────────────────────────────────────────────────────►
   └─ COPIES copy-count ─┘

►──┬──────────────────────────────────────────────────────────►
   └─ REPORT ID report-id ─┘

►──┬──────────────────────────────────────────────────────────►
   ├─ CLASS  printer-class ─┘                                  │
   │                                                           │
   └─ DESTINATION printer-destination ──┬──────────┬──────────┘
                                        └─ ALL ─┘

►──┬──────┬──────┬──────────────────────────────────────────────►◄
   └─ HOLD ─┘  └─ KEEP ─┘  └─ error-expression ─┘ . ──────────────
```

WRITE TO LOG/OPERATOR

```
►►── WRITE ── to ──┬─ LOG ──────┬──┬─ MESSAGE ──┬── message-options ── . ──►◄
                  └─ OPERator ─┘  └─ MSG ──────┘
```

Chapter 8. APPC Programming

8.1 Cooperative Processing Command Summary

Command	What It Does	When It's Issued
ALLOCATE	Begins a conversation with a server dialog.	The first communication command issued by the client dialog when it's ready to communicate.
CONFIRM	Sends a confirmation request to the remote program and waits for a reply.	Issued by the dialog in send state.
CONFIRMED	Sends a confirmation reply to the remote program.	Issued by the dialog in confirm state.
CONTROL SESSION	Acknowledges the conversation and agrees to the rules governing the conversation; a CA extension to APPC used in PC-to-mainframe conversations, but not required for mainframe-to-mainframe communication.	Issued by the server dialog in response to the client dialog's ALLOCATE; parameters must match those on the ALLOCATE.
DEALLOCATE	Ends the conversation.	The last command in the conversation issued by either dialog.
PREPARE-TO-RECEIVE	Changes the local side to receive state.	Issued by the dialog in send state in response to REQUEST-TO-SEND.
RECEIVE-AND-WAIT	Waits for a response from the remote program and receives the data or a value in the system field, WHAT-RECEIVED, upon arrival.	Issued by a dialog that wants to receive data =the dialog can be in send or receive state); when used in send state, it indicates that the local dialog wants to receive data, allowing the remote dialog to send data.
REQUEST-TO-SEND	Notifies the remote program that the local program is ready to send data.	Issued by the dialog in receive state.
SEND-DATA	Sends data to the remote program.	Issued by the dialog in send state.

Command	What It Does	When It's Issued
SEND-ERROR	Notifies the other dialog of an application-level error.	Issued by either dialog.

8.2 Cooperative Processing Commands

ALLOCATE

```
►►── ALLOCATE LU-NAME name ──┬──────────────────────────────────►
                             └─ MODE-NAME name ─┘
 ►── TPN task-code-name ──────────────────────────────────────►

 ►──┬──────────────────────────────────────────────────────────►
    └─ SECURITY ─┬─ NONE ◄ ──────────────────────────┐
                 ├─ SAME ─────────────────────────────┤
                 └─ PGM USER-ID id PASSWORD password ─┘

 ►──┬──────────────────────────────────────┬─ FORMAT ◄ ─┬──────►
    └─ SYNC-LEVEL ─┬─ NONE ◄ ─┬──────────┘  └─ NOFORMAT ─┘
                   └─ CONFIRM ─┘

 ►──┬──────────────────────────┬──────────────────────────┬── . ──►◄
    └─ LOCAL VERSION version ─┘  └─ REMOTE VERSION version ─┘
```

CONFIRM

```
►►── CONFIRM ── . ──────────────────────────────────────────►◄
```

CONFIRMED

```
►►── CONFIRMED ── . ──────────────────────────────────────────►◄
```

CONTROL SESSION

```
►►── CONTROL SESSION ──┬─ FORMAT ◄ ─┬──────────────────────────►
                       └─ NOFORMAT ─┘

 ►──┬──────────────────────────┬──────────────────────────┬── . ──►◄
    └─ LOCAL VERSION version ─┘  └─ REMOTE VERSION version ─┘
```

DEALLOCATE

```
►►── DEALLOCATE ──┬─ FLUSH ──────────┬── . ──────────────────────►◄
                  ├─ SYNC-LEVEL ◄ ─┤
                  ├─ ABEND ────────┤
                  └─ LOCAL ────────┘
```

PREPARE-TO-RECEIVE

```
►►── PREPARE-TO-RECEIVE ──┬─ SYNC-LEVEL ◄ ─┬── . ──────────────────►◄
                          └─ FLUSH ────────┘
```

RECEIVE-AND-WAIT

```
►►── RECEIVE-AND-WAIT ──┬──────────────────┬── . ──────────────────►◄
                        └─ variable-name ─┘
```

REQUEST-TO-SEND

```
►►── REQUEST-TO-SEND ── . ──────────────────────────────────────►◄
```

SEND-DATA

```
►►── SEND-DATA variable-name ── . ──────────────────────────────►◄
```

SEND-ERROR

```
►►── SEND-ERROR ── . ───────────────────────────────────────────►◄
```

8.3 Conversation States

To Issue This Command	The Dialog Must Be In This State	After This Return Code	The Dialog Is In This State
ALLOCATE	Reset	OK	Send
		Other	Reset
CONFIRM	Send	OK	Send
		PROG-ERROR	Receive
		Other	Deallocate
CONFIRMED	ConfirmR	OK	Receive
		Other	Deallocate
	ConfirmS	OK	Send
		Other	Deallocate
	ConfirmD	Any	Deallocate
CONTROL	Receive	OK	Receive
SESSION		Other	Deallocate
DEALLOCATE			
FLUSH	Send	Any	Reset
CONFIRM	Send	OK	Reset
		PROG-ERROR	Receive
		Other	Reset
ABEND	Any	Any	Reset
LOCAL	Deallocate	Any	Reset
PREPARE-TO-RECEIVE	Send	OK or PROG-ERROR	Receive
		Other	Deallocate
RECEIVE-AND-	Send or receive	OK, Data complete	Receive
WAIT		OK, Send	Send
		PROG-ERROR	Receive
		Other	Deallocate
		OK, CONFIRM	ConfirmR

To Issue This Command	The Dialog Must Be In This State	After This Return Code	The Dialog Is In This State
		OK, CONFIRM-SEND	ConfirmS
		OK, CONFIRM-	
		DEALLOCATE	ConfirmD
REQUEST-TO-	Receive	OK	Receive
SEND		Other	Deallocate
SEND-DATA	Send	OK	Send
		PROG-ERROR	Receive
		Other	Deallocate
SEND-ERROR	Send or Receive	OK	Send
		PROG-ERROR	Receive
		Other	Deallocate
	ConfirmR	OK	Send
	ConfirmS	PROG-ERROR	N/A
	ConfirmD	Other	Deallocate

8.4 APPC Status

APPCCODE Values

APPCCODE	Status
0	OK
-1	Parameter check
-3	Allocation error
-4	Resource failure
-5	Deallocate condition
-6	Program error
-7	SVC error
-8	State error
-9	Unsuccessful
-10	Control session error
-11	Format descriptor error
-12	Send-data error
-13	Receive format error

8.5 OSCaR Commands

OPEN CONVERSATION

```
►►── OPEN CONVersation ──────────────────────────────────────────►
►─┬─────────────────────────────────────────────────────────────►
  └─ LU-NAME lu-name ─┬──────────────────┐
                      └─ MODE mode-name ─┘
►─┬─────────────────────────────────────────────────────────────►─
  └─ TRANSACTION task-code ─┬──────────────────────────────────┐
                            └─ SECURITY user-id ─┬──────────────┐
                                                 └─ PASSWORD password ─┘
─►──────────────────────────────────────────────────────────────┐
  ────────────────────────────────────────────────────────────┐ .──►◄
  └─ LU-NAME lu-name ─┬──────────────────┐
                      └─ MODE mode-name ─┘
```

SEND

```
►►── SEND data-name ─┬──────────────┐──────────────────────────── . ──►◄
                     ├─ TRANSlate ──┤
                     └─ NOTRANSlate ─┘
```

CLOSE CONVERATION

```
►►── CLOSE CONVersation ──────────────────────────────────────── . ──►◄
```

RECEIVE

```
►►── RECEIVE data-name ─┬──────────────┐──────────────────────────── . ──►◄
                        ├─ TRANSlate ──┤
                        └─ NOTRANSlate ─┘
```

Chapter 9. ADSORPTS

REPORT Summary

Report	Description
1	Lists detail information about dialogs and their components.
2	Lists information about specified dialogs.
3	Lists all dialogs associated with specified processes.
4	Lists all dialogs associated with specified records.
5	Lists all dialogs associated with specified subschemas.
6	Lists all dialogs associated with specified maps.

APPLICATIONS

```
►►── APPLications = ──────────────────────────────────────────────────►

►─┬─ ALL ────────────────────────────────────────────────────────┬─ , ─►
  │            ┌──────────────────── , ─────────────────────┐    │
  └─┬─────┬────↓─┬─ application-name ─────────────────────────┴─┬─────┬┘
    └─ ( ─┘      ├─ application-mask-value ──────────────────┤ └─ ) ─┘
                 └─ low-application-name - high-application-name ─┘

►─┬──────────────────────────────────────────────────────────┬─ , ──►
  └─ VERsions = ─┬─ ALL ◄ ─────────────────────────────────┤
                 ├─ version-number ─────────────────────────┤
                 └─ low-version-number - high-version-number ┘

►─┬──────────────────────────────────────────────────────────┬───────►◄
  └─ REPORTs = ─┬─ ALL ────────────────────────────────────┤
                │          ┌──────────────────┐             │
                └─┬─────┬──↓─┬─ SUMmary ◄ ────┴──┬─┬─────┬─┘
                  └─ ( ─┘    ├─┬─ RECords ─┬─────┤ └─ ) ─┘
                             │ └─ RCD ─────┘     │
                             ├─ F/RSUMmary ──────┤
                             └─ F/RDETail ───────┘
```

DIALOGS

```
►►── DIALOGs = ──────────────────────────────────────────────────►
►─┬─ ALL ──────────────────────────────────────────────────────┬─ , ──►
  │                  ┌──────────────────────────────────┐      │
  │   ┌─(─┐   ┌─────┴─────────────────────────────────┐│┌─)─┐│
  │   │   │   ├─ dialog-name ──────────────────────────┤││   ││
  │   │   │   ├─ dialog-mask-value ────────────────────┤││   ││
  │   │   │   └─ low-dialog-name - high-dialog-name ───┘│└───┘│
  └───┴───┴─────────────────────────────────────────────┘└─────┘

►──┬─ VERsions = ──┬─ ALL ◄ ──────────────────────────┬─ , ──►
   │               ├─ version-number ──────────────────┤
   │               └─ low-version-number - high-version-number ─┘

►──┬─ REPORTs = ─┬─ ALL ──────────────────────────────────────┬──►◄
   │             │                ┌──────────────────────┐    │
   │             │   ┌─(─┐   ┌────┴──────────────────────┐│┌─)─┐│
   │             │   │   │   ├─ SUMmary ◄ ───────────────┤││   ││
   │             │   │   │   ├─┬─ RECords ──┬──────────┤││   ││
   │             │   │   │   │ └─ RCD ──────┘          ││└───┘│
   │             │   │   │   ├─ FDBlist ───────────────┤│     │
   │             │   │   │   └─ PROcesses ─┬──────────┘│     │
   │             │   │   │                 └─ sxref-options ─┘│
   └─────────────┴───┴───┴────────────────────────────────────┘
```

Sxref-Options

```
►►── with SXREF ─┬──────────────────────────────────────────────►◄
                └─ ( ─┬─ LONG ──────┬─ ) ─┘
                      └─ SHORT ◄ ───┘
```

LIST

```
►►──┬─ LIST = ─┬─ NARROW ──┬──────────────────────────────────►◄
    │          ├─ FULLlist ─┤
    │          └─ WIDE ◄ ───┘
```

NODENAME

```
►►──┬─ NODENAME ─┬─ IS ─┬─ node-name ─┘──────────────────────►
    │            └─ = ──┘
```

```
►──┬─ DBNAME ─┬─ IS ─┬─ dictionary-name ─┘──────────────────►◄
   │          └─ = ──┘
```

SEARCH

```
►►──┬─ SEARCH = ─┬─ loadAREA ◄ ─┬──────────────────────────►◄
    │            └─ loadLIB ────┘
```

Chapter 10. Application and Dialog Utilities

10.1 ADSOBCOM

Standard Control Statements

```
►►─┬─────────────────────────────────────────────────────────────────────►◄
   └─ ICTL = (start-column-number  end-column-number) ─┘

►►─┬─────────────────────────────────────────────────────────────────────►◄
   └─ OCTL = (line-count-number) ─┘

►►─┬─────────────────────────────────────────────────────────────────────►◄
   └─ ISEQ = (start-column-number  end-column-number) ─┘
```

SIGNON

```
►►─┬──────────────────────────────────────────────────────────────────►
   └─ SIGnon ─┬─ USER ─┬─────┬─ user-name ─┬──────────────────────────┬──
              │        ├─ IS ─┤             └─ PASSword ─┬─────┬─ password ─┘
              │        └─ = ──┘                          ├─ IS ─┤
              │                                          └─ = ──┘

►──────────────────────────────────────────────────────────────────►
  ──┬──────────────────────────────────────────────────────────────┬──
    └─ DICTNAME ─┬─────┬─ dictionary-name ─┘
                 ├─ IS ─┤
                 └─ = ──┘

►──────────────────────────────────────────────────────────────────────►◄
  ──┬──────────────────────────────────────────────────────────────┬──
    └─ DICTNODE ─┬─────┬─ node-name ─┘ . ─┘
                 ├─ IS ─┤
                 └─ = ──┘
```

COMPILE

```
►►─── COMpile from ──────────────────────────────────────────────────────►

          ┌──────────────────────┐
►─┬─ SOUrce ─↓── dialog-expression ─┘──────────────────────────────────────►─
  └─ LOAD ─┬─ ALL ─────────────────────────────────────────────────────────
           └─ DIALog ─┬──────┬─ ( ─↓─ dialog-name-options ─┴─ ) ──────────
                      ├─ IS ─┤
                      └─ = ──┘

►──────────────────────────────────────────────────────────────┬─ . ──►◄
 ───────────────────────────────────────────────────────────┬─┘
 ┌─────────────────────────────────────────────────────────┘
 └─ VERsion ─┬──────┬─ ( ─↓── version-number-options ─┴─ ) ─┘
             ├─ IS ─┤
             └─ = ──┘
```

DECOMPILE

```
►►─── DECOMpile ─────────────────────────────────────────────────────────►

►──────────────┬─ ALL ─────────────────────────────────────────────────────
               └─ DIALog ─┬──────┬─ ( ─↓─ dialog-name-options ─┴─ ) ──────
                          ├─ IS ─┤
                          └─ = ──┘

►───────────────────────────────────────────────────────────┬───── . ──►◄
 ┌─────────────────────────────────────────────────────────┘
 └─ VERsion ─┬──────┬─ ( ─↓── version-number-options ─┴─ ) ─┘
             ├─ IS ─┤
             └─ = ──┘
```

Dialog-Name-Options

```
►►─┬─ dialog-name ──────────────────────────────────────────┬──────────►◄
   ├─ dialog-mask-value ────────────────────────────────────┤
   ├─ ( low-dialog-name  high-dialog-name ) ────────────────┤
   └─ ( low-dialog-mask-value  high-dialog-mask-value ) ────┘
```

Version-Number-Options

```
►►─┬─ version-number ──────────────────────────────┬──────────────────►◄
   └─ ( low-version-number  high-version-number ) ─┘
```

Dialog-Expression

```
►►─┬─┬───────────┬── DIAlog ───┬──────┬─── dialog-name ──────────────────┬─►
   │ ├─ ADD ─────┤             ├─ IS ─┤                                   │
   │ └─ DELete ──┘             └─ = ──┘                                   │
   └ MODify DIAlog dialog-name-options ─┬───────────────────────────────┬─┘
                                        └ VERsion ─┬──────┬─ version#-options ┘
                                                   ├─ IS ─┤
                                                   └─ = ──┘

►─┬────────────────────────────────────────────────┬──────────────────────►
  └─ VERsion ──┬──────┬── version-number ──────────┘
               ├─ IS ─┤
               └─ = ──┘

►─┬──────────────────────────────────────────┬────────────────────────────►
  └─ MAInline ──┬──────┬─┬─ YES ───┬─────────┘
                ├─ IS ─┤ └─ NO ◄ ──┘
                └─ = ──┘

►─┬───────────────────────────────────────────────────────────────────────►─
  └───┬─────────────┬─── SUBschema ──┬──────┬─── subschema-name ──────
      ├─ ADD ───────┤                ├─ IS ─┤
      ├─ MODify ────┤                └─ = ──┘
      └─ DELete ────┘

─►─┬──────────────────────────────────────────────────────────────────┬──►
   └──────────────────────────────────────────────────────────────┬──┘
  └─ SCHema ─┬──────┬── schema-name ──┬─────────────────────────────────┬─┘
             ├─ IS ─┤                 └─ VERsion ─┬──────┬─ version-number ─┘
             └─ = ──┘                             ├─ IS ─┤
                                                  └─ = ──┘

►─┬──────────────────────────────────────────────────────────────────┬───►
  └─┬───────────┬── ACCess MODule (AM) ──┬──────┬── access-module-name ─┘
    ├─ ADD ─────┤                        ├─ IS ─┤
    ├─ MODify ──┤                        └─ = ──┘
    └─ DELete ──┘

►─┬───────────────────────────────────────────────────────────────────────►─
  └─┬───────────┬──────────────────────────────────────────────────────
    ├─ ADD ─────┤
    ├─ MODify ──┤
    └─ DELete ──┘
```

```
►──┬──────────┬─ MAP ─┬─────┬─ map-name ──┬──────────────────────────┬──►
   └─ ONLine ─┘       ├─ IS ─┤             └─ version ─┬─────┬─ version# ─┘
                      └─ = ──┘                         ├─ IS ─┤
                                                       └─ = ──┘

►──┬──────────────────────────────────────────────────────────────────►
   │
   ├─ ADD ────┤
   ├─ MODify ─┤
   └─ DELete ─┘

►──────────────────────────────────────────────────────────────────────►
── INput ──┬──────────────────────────────────────────────────────────┬──
           └─ MAPname ─┬─ IS ─┬─ map-name ──┬──────────────────────────┬─
                       └─ = ──┘             └─ version ─┬─────┬─ version# ─┘
                                                        ├─ IS ─┤
                                                        └─ = ──┘

►──┬──────────────────────────────────────────────────────────────────┬──►
   └─ FILEname ─┬─────┬─ run-time-label ─┘└─ SUSfile ─┬─────┬─ suspense-label ─┘
                ├─ IS ─┤                              ├─ IS ─┤
                └─ = ──┘                              └─ = ──┘

►──┬──────────────────────────────────────────────────────────────────►
   │
   ├─ ADD ────┤
   ├─ MODify ─┤
   └─ DELete ─┘

►──────────────────────────────────────────────────────────────────────►
── OUTput ──┬──────────────────────────────────────────────────────────
            └─ MAPname ─┬─ IS ─┬─ map-name ──┬──────────────────────────┬─
                        └─ = ──┘             └─ version ─┬─────┬─ version# ─┘
                                                         ├─ IS ─┤
                                                         └─ = ──┘

►──────────────────────────────────────────────────────────────────────►
   ┌──────────────────────────────────────────────────────────────────┐
   └─ FILEname ─┬─────┬─ run-time-label ─┘
                ├─ IS ─┤
                └─ = ──┘

►──┬──────────────────────────────────────────────────────────────────►
   └─ AUTostatus ─┬─────┬─┬─ Yes ─┬─┘
                  ├─ IS ─┤ └─ No ──┘
                  └─ = ──┘

►──┬──────────────────────────────────────────────────────────────────►
   └─ STAtus ─┬──────────────────────────┬─┬─────┬─ record-name ──────
              └─ DEFinition ─┬──────────┬─┘ ├─ IS ─┤
                             └─ RECord ─┘   └─ = ──┘
```

```
──►┬──────────────────────────────────────────────────────────────────────────►
   │
   └─ VERsion ──┬──────────┬── version-number ──┘
                ├─ IS ─────┤
                └─ = ──────┘

──►┬──────────────────────────────────────────────────────────────────────────►
   │
   └─ AUTO ──┬──────────┬──┬──────────┬──┬─ Yes ◄ ─┬──┘
             └─ DISPlay ─┘  ├─ IS ─────┤  └─ No ────┘
                            └─ = ──────┘

──►┬──────────────────────────────────────────────────────────────────────────►
   │
   └─ PAGing MODE ──┬──────────┬──┬─ UPDate ◄ ─┬──┘
                    ├─ IS ─────┤  └─ BROwse ────┘
                    └─ = ──────┘

──►┬──────────────────────────────────────────────────────────────────────────►
   │
   └─ BACKpage ──┬──────────┬──┬─ Yes ◄ ─┬──┘
                 ├─ IS ─────┤  └─ No ────┘
                 └─ = ──────┘

──►┬──────────────────────────────────────────────────────────────────────────►
   │
   └─ PAGing TYPE ──┬──────────┬──┬─ Nowait ◄ ─┬──┘
                    ├─ IS ─────┤  ├─ Return ────┤
                    └─ = ──────┘  └─ Wait ──────┘

──►┬──────────────────────────────────────────────────────────────────────────►
   │
   └─ ACTivity log ──┬──────────┬──┬─ Yes ─┬──┘
                     ├─ IS ─────┤  └─ No ──┘
                     └─ = ──────┘

──►┬──────────────────────────────────────────────────────────────────────────►
   │
   └─ SYMbol ──┬──────────┬──┬──────────┬──┬─ Yes ─┬──┘
               └─ TABle ───┘  ├─ IS ─────┤  └─ No ◄ ─┘
                              └─ = ──────┘

──►┬──────────────────────────────────────────────────────────────────────────►
   │
   └─ DIAGnostic ──┬──────────┬──┬──────────┬──┬─ Yes ◄ ─┬──┘
                   └─ TABle ───┘  ├─ IS ─────┤  └─ No ────┘
                                  └─ = ──────┘

──►┬──────────────────────────────────────────────────────────────────────────►
   │
   └─ MESsage PREfix ──┬──────────┬──┬─ prefix ─────┬──┘
                       ├─ IS ─────┤  └─ DEfault ◄ ─┘
                       └─ = ──────┘
```

```
►──┬──────────────────────────────────────────────────────────────────►
   └─ COBol ─┬──────────┬─┬──────────┬─┬─ Yes ─┬──┘
             └─ MOVe ───┘ ├─ IS ─────┤ └─ No ──┘
                          └─ = ───────┘

►──┬──────────────────────────────────────────────────────────────────►
   └─┬─ ENTRY POINT ─┬─┬──────────┬─┬─ Premap ◄ ─┬──┘
     └─ EP ──────────┘ ├─ IS ─────┤ └─ Map ──────┘
                       └─ = ───────┘

►──┬──────────────────────────────────────────────────────────────────►
   └─ RETrieval LOCKing ─┬──────────┬─┬─ Yes ◄ ─┬──┘
                         ├─ IS ─────┤ └─ No ────┘
                         └─ = ───────┘

►──┬──────────────────────────────────────────────────────────────────►
   └─── SQL CHEck SYNtax ─┬─ EXTended ◄ ─┬──────────────────────────┘
                          ├─ SQL89 ──────┤
                          └─ FIPS ───────┘

►──┬──────────────────────────────────────────────────────────────────►
   └─── SQL ── DATe ─┬──────────┬─┬─ ISO ─┬──┘
                     ├─ IS ─────┤ ├─ USA ─┤
                     └─ = ───────┘ ├─ EUR ─┤
                                   └─ JIS ─┘

►──┬──────────────────────────────────────────────────────────────────►
   └─── SQL ── TIMe ─┬──────────┬─┬─ ISO ─┬──┘
                     ├─ IS ─────┤ ├─ USA ─┤
                     └─ = ───────┘ ├─ EUR ─┤
                                   └─ JIS ─┘

►──┬──────────────────────────────────────────────────────────────────►
   │   ┌──────────────────────────────────────────────────────────┐
   └─↓─┬──────────┬─ SQL TABle ─┬──────────┬─ table-name ─┬──────────┬──┘
       ├─ ADD ────┤             ├─ IS ─────┤              └─ table-options ─┘
       ├─ MODify ─┤             └─ = ───────┘
       └─ DELete ─┘

►──┬──────────────────────────────────────────────────────────────────►
   │   ┌──────────────────────────────────────────────────────────┐
   └─↓─┬──────────┬─ RECord ─┬──────────┬─ record-name record-options ─┬──┘
       ├─ ADD ────┤          ├─ IS ─────┤                               │
       ├─ MODify ─┤          └─ = ───────┘                               │
       └─ DELete ─┘
```

```
►──┬──────────────────────────────────────────────────────────────►
   │                  ┌─ PROcess ─┬─────────┐   ┌─ IS ─┐
   │  ┌─ ADD ────┐    │           └─ NAMe ──┘   │      │
   ├──┤─ MODify ─├── PREmap ──────────────────────┤      ├──────────
   │  └─ DELete ─┘    │                         │ =    │
   │                  └─────────────────────────┘      │
   │                                                   │

►──┬──────────────────────────────────────────────────────────────►
   │ ── process-name ──┬──────────────────────────────────────┐
   │                   │ VERsion ─┬─ IS ─┬── version-number ─┘
   │                   │          │ =    │
   │                   │          │      │
   │                   │          │      │

►──┬──────────────────────────────────────────────────────────────►
   │                  ┌─ PROcess ─┬─────────┐   ┌─ IS ─┐
   │  ┌─ ADD ────┐    │           └─ NAMe ──┘   │      │
   ├──┤─ MODify ─├── DECLaration ──────────────────┤      ├──────────
   │  └─ DELete ─┘    │                         │ =    │
   │                  └─────────────────────────┘      │
   │                                                   │

►──┬──────────────────────────────────────────────────────────────►
   │ ── process-name ──┬──────────────────────────────────────┐
   │                   │ VERsion ─┬─ IS ─┬── version-number ─┘
   │                   │          │ =    │
   │                   │          │      │
   │                   │          │      │

►──┬──┬──────────────────────────────────────────────────────────►◄
   │  ↓                                                          │
   │  │  ┌─ ADD ────┐   RESponse ── response-options ──┬──┘
   │  ├──┤─ MODify ─├──────────────────────────────────┤
   │  │  └─ DELete ─┘                                  │
   │  │                                                │
   │  │                                                │
   │  │                                                │
```

Response-Options

```
►►─┬──────────┬─ RESponse ─┬──────────────────────┬─┬──────┬─ process-name ──►
   ├─ ADD ────┤            └─ PROcess ─┬──────┬─┘ ├─ IS ─┤
   ├─ MODify ─┤                         └─ NAMe ─┘ └─ = ─┘
   └─ DELete ─┘

►─┬──────────────────────────────────────────────────────────────────────────┬──►
  └─ VERsion ─┬──────┬─ version-number ─┘ └─ DEFault ─┬──────┬─┬─────┬─┘
              ├─ IS ─┤                                ├─ IS ─┤ └─ Yes ─┘
              └─ = ─┘                                └─ = ─┘ └─ No ◄ ─┘

►─┬──────────────────────────────────────────────────────────────────────────┬──►
  │ ┌──────────────────────────────────────────────────────────────────────┐ │
  └─↓─┬─ CONtrol KEY ─┬──────┬─ key ─┬──────────────────────┬──────────────┬─┘
      │               ├─ IS ─┤       └─ FROm old-key ─┘                    │
      │               └─ = ─┘                                              │
      ├─ RESponse ─┬──────────────────┬─┬──────┬─ value ─┬──────────────────┬─┤
      │            └─ FIELD ─┬──────┬─┘ ├─ IS ─┤         └─ FROm old-value ─┘ │
      │                      └─ VALue ─┘ └─ = ─┘                              │
      ├─ BATch CONtrol EVENT ─┬──────┬─ event ──────────────────────────────┤
      └─ BCE ─────────────────┘ ├─ IS ─┤                                     │
                                └─ = ─┘

►─┬──────────────────────────────────────────────────────────────────────────┬──►◄
  └─ EXEc ON EDIT ERRors ─┬──────┬─┬─────┬─┘
                          ├─ IS ─┤ └─ No ◄ ─┘
                          └─ = ─┘
```

Table-Options

```
►►─┬──────────────────────────────────────────────────────────────────────────┬──►◄
   └─ SCHema ─┬──────┬─ sql-schema-name ─┘ │ ┌──────────────────────────┐ │
              ├─ IS ─┤                     └─↓─┬─ NEW copy ─┬──────────┬─┘
              └─ = ─┘                          ├─ NC ───────┤          │
                                               ├─ WORk ─────┤          │
                                               └─ WK ───────┘
```

Record-Options

```
►►─┬──────────────────────────────────────────────────────────────────────────┬──►◄
   └─ VERsion ─┬──────┬─ version-number ─┘ │ ┌──────────────────────────┐ │
               ├─ IS ─┤                     └─↓─┬─ NEW copy ─┬──────────┬─┘
               └─ = ─┘                          ├─ NC ───────┤          │
                                                ├─ WORk ─────┤          │
                                                └─ WK ───────┘
```

Version#-Options

```
►►─┬─ version-number ──────────────────────────────────────────────────────────►◄
   └─ ( low-version-number  high-version-number ) ─┘
```

10.2 ADSOBSYS

Control Statements

```
►►─┬─────────────────────────────────────────────────────────────────────────►◄
   └─ ICTL = (start-column-number  end-column-number) ─┘

►►─┬─────────────────────────────────────────────────────────────────────────►◄
   └─ OCTL = (line-count-number) ─┘

►►─┬─────────────────────────────────────────────────────────────────────────►◄
   └─ ISEQ = (start-column-number  end-column-number) ─┘
```

SYSTEM

```
►►─ SYStem ─┬──────┬─ system-number ─┬─────────────────────────────────────►◄
            ├─ IS ─┤                 └─ MODULE ─┬──────┬─ module-name ─┘
            └─ = ─┘                              ├─ IS ─┤
                                                 └─ = ─┘
```

10.3 ADSOBTAT

Control Statements

```
►►──┬─ DICTNAME ──┬─────┬── dictionary-name ─┘
    │             ├─ IS ─┤
    │             └─ = ──┘
    ►──┬─ DICTNODE ──┬─────┬── node-name ─┘
       │             ├─ IS ─┤
       │             └─ = ──┘
       ►──┬─ LOCation for ─┬─ APPlication ─┬──┬─────┬──┬─ loadAREA ◄ ─┬─┘
          │                └─ ADB ─────────┘  ├─ IS ─┤  └─ loadLIB ────┘
          ►──┬──────────────────────────────────┬──┬─────┬──┬─────────────┬──►◄
             ↓                                  │  ├─ IS ─┤  │             │
             ├─ ADD ─────┬─ APPlication ─┬──┬─────┬──┬─ application ─┘
             ├─ MODify ──┤               │  ├─ IS ─┤
             └─ DELete ──┘               └─ ADB ─────┘  └─ = ──┘
```

Application

```
►── application-name ──┬─ VERsion ──┬─────┬── version-number ─┬──►◄
                       │             ├─ IS ─┤                  │
                       │             └─ = ──┘                  │
```

10.4 ADSOTATU

```
                    COMPUTER ASSOCIATES INTERNATIONAL, INC.
   CA-ADS REL 15.0                                   ***TAT UPDATE UTILITY***



                            DICT NAME:                      NODE:

ACTION:      (ADD/MOD/DEL)
APPLICATION:                VERSION:
```

DICT NAME	The dictionary in which the TAT is stored.
NODE	The node that controls the dictionary specified in DICT NAME (for DDS only).
ADD	Task code entries for an application are added to the TAT.
MODify	Task code entries for an application are replaced in the TAT by the task codes defined in the current application load module.
DELete	Task code entries for an application being deleted from the TAT.
APPLICATION	The name of the application.
VERSION	The version number (in the range 1 through 9999) of the application.

Chapter 11. Assembler Macros

#EFUNMST

```
►►─── #EFUNMST TYPE = ──┬─ INITIAL ──────────────────────────────►─
                        ├─ FINAL ────────────────────────────────
                        └─ ENTRY, INVOKE = invocation-name ─ , ──

─►──────────────────────────────────────────────────────────────►
──────────────────────────────────────────────────────────────────
  ─── FUNCT = ──┬─ function-name ─┬─ , ──────────────────────────
                └─ * ─────────────┘

─►──────────────────────────────────────────────────────────────►◄
  ──────────────────────────────────────────────────────────────┐
  ─ PROGRAM = ──┬─ model-xde-module ──┬──────────────────────────┤
                │                     └─ , VERSION = version-number ┘
                └─ * ─────────────────────────────────────────────┘
```

#EFUNMOD

```
►►─── #EFUNMOD TYPE = ──┬─ INITIAL, NAME = model-xde-module-name ──┬──►◄
                        ├─ HDR, hdr-options ──────────────────────┤
                        ├─ XDE, DECS = decimal-options ───────────┤
                        ├─ DATA, CONV = ( conv-options ) ─────────┤
                        └─ FINAL ─────────────────────────────────┘
```

Hdr-Options

```
►►── FUNCNAM = function-name ── , ──────────────────────────────►
 ►── PROGRAM = processing-program-name ── , ──────────────────────►
 ►── FUNCNBR = function-number ── , ──────────────────────────────►
 ►── WORKLNG = work-area-length ── , ─────────────────────────────►
 ►── FIXOPND = fixed-operands-count ── , ─────────────────────────►
 ►┬──────────────────────────────────────────────────────────────►
  └─ VAROPND = ┬─ YES ──┬── , ┘
               └─ NO ◄──┘
 ►── RESLNG = ┬─ CALC ──────────┬── , ──────────────────────────►
              ├─ OPND ──────────┤
              └─ result-length ─┘
 ►── RESDATP = ┬─ OPND ──────┬── , ──────────────────────────────►
               └─ data-type ─┘
 ►── RESDEC = ┬─ OPND ──────────────────────────────────────────►◄
              └─ result-decimal-places ─┘
```

Decimal Options

```
►►┬─ SOURCE ──────────┬── , ──┬──────────────────────────────────►
  └─ decimal-places ──┘       └─ OPT = ┬─ YES ──┬── , ┘
                                        └─ NO ◄──┘
 ►┬──────────────────────────────────────────────────────────────►
  └─ ROUND = ┬─ YES ◄──┬── , ┘  └─ RESLCAL = ┬─ ADD ──┬── , ┘
             └─ NO ─────┘                     └─ SUBT ─┘
 ►┬──────────────────────────────────────────────────────────────►◄
  └─ RESDEFL = ┬─ YES ──┬┘
               └─ NO ◄──┘
```

Conv-Options

```
►►── source-data-type ── , ┬─ SOURCE ──────────┬──┬──────────────►◄
                          └─ target-data-type ─┘  ├─ ,SOURCE ──────┤
                                                  └─ ,target-length ┘
```

Calling a User-Defined Built-In Function

```
                    ┌──── , ────┐
►►── invocation-name ─── ( ─↓─ parameter ─┘ ) ──────────────────►◄
```

Chapter 12. CA-ADS System Records

12.1 ADSO-APPLICATION-GLOBAL-RECORD

```
01  ADSO-APPLICATION-GLOBAL-RECORD.
 03  AGR-APPLICATION-NAME    PICTURE IS X(8)   USAGE IS DISPLAY.
 03  AGR-CURRENT-FUNCTION    PICTURE IS X(8)   USAGE IS DISPLAY.
 03  AGR-NEXT-FUNCTION       PICTURE IS X(8)   USAGE IS DISPLAY.
 03  AGR-CURRENT-RESPONSE    PICTURE IS X(8)   USAGE IS DISPLAY.
 03  AGR-DEFAULT-RESPONSE    PICTURE IS X(8)   USAGE IS DISPLAY.
 03  AGR-TASK-CODE           PICTURE IS X(8)   USAGE IS DISPLAY.
 03  AGR-EXIT-DIALOG         PICTURE IS X(8)   USAGE IS DISPLAY.
 03  AGR-PRINT-DESTINATION   PICTURE IS X(8)   USAGE IS DISPLAY.
 03  AGR-DATE                PICTURE IS X(8)   USAGE IS DISPLAY.
 03  AGR-USER-ID             PICTURE IS X(32)  USAGE IS DISPLAY.
 03  AGR-SECURITY-CODE       PICTURE IS X(32)  USAGE IS DISPLAY.
 03  AGR-INSTALLATION-CODE   PICTURE IS X(32)  USAGE IS DISPLAY.
 03  AGR-PASSED-DATA                           USAGE IS DISPLAY.
     05  AGR-PASSED-ONE      PICTURE IS X(32)  USAGE IS DISPLAY.
     05  AGR-PASSED-TWO      PICTURE IS X(32)  USAGE IS DISPLAY.
     05  AGR-PASSED-THREE    PICTURE IS X(32)  USAGE IS DISPLAY.
     05  AGR-PASSED-FOUR     PICTURE IS X(32)  USAGE IS DISPLAY.
 03  AGR-APPLICATION-VERSION PICTURE IS S9(4)  USAGE IS COMP.
 03  AGR-APPL-SECURITY-CLASS PICTURE IS S999   USAGE IS COMP.
 03  AGR-RESP-SECURITY-CLASS PICTURE IS S999   USAGE IS COMP.
 03  AGR-PRINT-CLASS         PICTURE IS S999   USAGE IS COMP.
 03  AGR-MODE                PICTURE IS X(4)   USAGE IS DISPLAY.
     88  AGR-STEP-MODE USAGE IS CONDITION-NAME VALUE IS 'STEP'.
     88  AGR-FAST-MODE USAGE IS CONDITION-NAME VALUE IS 'FAST'.
 03  AGR-DATE-FORMAT         PICTURE IS X      USAGE IS DISPLAY.
     88  AGR-MMDDYY    USAGE IS CONDITION-NAME VALUE IS 'C'.
     88  AGR-DDMMYY    USAGE IS CONDITION-NAME VALUE IS 'E'.
     88  AGR-YYMMDD    USAGE IS CONDITION-NAME VALUE IS 'G'.
     88  AGR-YYDDD     USAGE IS CONDITION-NAME VALUE IS 'J'.
 03  AGR-AID-BYTE            PICTURE IS X      USAGE IS DISPLAY.
     88  AGR-ENTER     USAGE IS CONDITION-NAME VALUE IS QUOTE.
     88  AGR-PF1       USAGE IS CONDITION-NAME VALUE IS '1'.
     88  AGR-PF2       USAGE IS CONDITION-NAME VALUE IS '2'.
     88  AGR-PF3       USAGE IS CONDITION-NAME VALUE IS '3'.
     88  AGR-PF4       USAGE IS CONDITION-NAME VALUE IS '4'.
     88  AGR-PF5       USAGE IS CONDITION-NAME VALUE IS '5'.
     88  AGR-PF6       USAGE IS CONDITION-NAME VALUE IS '6'.
     88  AGR-PF7       USAGE IS CONDITION-NAME VALUE IS '7'.
     88  AGR-PF8       USAGE IS CONDITION-NAME VALUE IS '8'.
     88  AGR-PF9       USAGE IS CONDITION-NAME VALUE IS '9'.
     88  AGR-PF10      USAGE IS CONDITION-NAME VALUE IS ':'.
     88  AGR-PF11      USAGE IS CONDITION-NAME VALUE IS '#'.
     88  AGR-PF12      USAGE IS CONDITION-NAME VALUE IS '@'.
     88  AGR-PF13      USAGE IS CONDITION-NAME VALUE IS 'A'.
     88  AGR-PF14      USAGE IS CONDITION-NAME VALUE IS 'B'.
     88  AGR-PF15      USAGE IS CONDITION-NAME VALUE IS 'C'.
```

```
    88  AGR-PF16      USAGE IS CONDITION-NAME VALUE IS 'D'.
    88  AGR-PF17      USAGE IS CONDITION-NAME VALUE IS 'E'.
    88  AGR-PF18      USAGE IS CONDITION-NAME VALUE IS 'F'.
    88  AGR-PF19      USAGE IS CONDITION-NAME VALUE IS 'G'.
    88  AGR-PF20      USAGE IS CONDITION-NAME VALUE IS 'H'.
    88  AGR-PF21      USAGE IS CONDITION-NAME VALUE IS 'I'.
    88  AGR-PF22      USAGE IS CONDITION-NAME VALUE IS '¢'.
    88  AGR-PF23      USAGE IS CONDITION-NAME VALUE IS '.'.
    88  AGR-PF24      USAGE IS CONDITION-NAME VALUE IS '<'.
    88  AGR-PA1       USAGE IS CONDITION-NAME VALUE IS '%'.
    88  AGR-PA2       USAGE IS CONDITION-NAME VALUE IS '>'.
    88  AGR-PA3       USAGE IS CONDITION-NAME VALUE IS ','.
    88  AGR-CLEAR     USAGE IS CONDITION-NAME VALUE IS '_'.
    88  AGR-LPEN      USAGE IS CONDITION-NAME VALUE IS '='.
    88  AGR-EOF       USAGE IS CONDITION-NAME VALUE IS 'N'.
    88  AGR-IOERR     USAGE IS CONDITION-NAME VALUE IS 'O'.
    88  AGR-SERR      USAGE IS CONDITION-NAME VALUE IS 'P'.
    88  AGR-IERR      USAGE IS CONDITION-NAME VALUE IS 'R'.
    88  AGR-OERR      USAGE IS CONDITION-NAME VALUE IS 'S'.
03  AGR-CURRENT-FUNC-TYPE   PICTURE IS X      USAGE IS DISPLAY.
    88  AGR-FUNCTION-DIALOG    USAGE IS CONDITION-NAME
                                             VALUE IS 'D'.
    88  AGR-FUNCTION-MENU      USAGE IS CONDITION-NAME
                                             VALUE IS 'M'.
    88  AGR-FUNCTION-SIGNON    USAGE IS CONDITION-NAME
                                             VALUE IS 'S'.
03  AGR-NEXT-FUNC-TYPE      PICTURE IS X      USAGE IS DISPLAY.
    88  AGR-NEXT-DIALOG  USAGE IS CONDITION-NAME VALUE IS 'D'.
    88  AGR-NEXT-MENU    USAGE IS CONDITION-NAME VALUE IS 'G'.
    88  AGR-NEXT-MENU-DIALOG   USAGE IS CONDITION-NAME
                                               VALUE IS 'M'.
    88  AGR-NEXT-SIGNON  USAGE IS CONDITION-NAME VALUE IS 'N'.
    88  AGR-NEXT-SIGNON-DIALOG USAGE IS CONDITION-NAME
                                               VALUE IS 'S'.
    88  AGR-NEXT-PROGRAM USAGE IS CONDITION-NAME VALUE IS 'P'.
    88  AGR-NEXT-SYSTEM-FUNC USAGE IS CONDITION-NAME
                                               VALUE IS 'F'
                                               VALUE IS 'B'
                                               VALUE IS 'O'
                                               VALUE IS 'U'
                                               VALUE IS 'R'
                                               VALUE IS 'T'
                                               VALUE IS 'Q'.
    88  AGR-NEXT-FORWARD USAGE IS CONDITION-NAME VALUE IS 'F'.
    88  AGR-NEXT-BACKWARD USAGE IS CONDITION-NAME VALUE IS 'B'.
    88  AGR-NEXT-POP     USAGE IS CONDITION-NAME VALUE IS 'O'.
    88  AGR-NEXT-POPTOP  USAGE IS CONDITION-NAME VALUE IS 'U'.
    88  AGR-NEXT-RETURN  USAGE IS CONDITION-NAME VALUE IS 'R'.
    88  AGR-NEXT-TOP     USAGE IS CONDITION-NAME VALUE IS 'T'.
    88  AGR-NEXT-QUIT    USAGE IS CONDITION-NAME VALUE IS 'Q'.
03  AGR-CTRL-COMMAND        PICTURE IS X      USAGE IS DISPLAY.
```

```
    88  AGR-TRANSFER     USAGE IS CONDITION-NAME VALUE IS 'T'.
    88  AGR-INVOKE       USAGE IS CONDITION-NAME VALUE IS 'I'.
    88  AGR-LINK         USAGE IS CONDITION-NAME VALUE IS 'L'.
    88  AGR-RETURN       USAGE IS CONDITION-NAME VALUE IS 'R'.
03  AGR-SIGNON-SWITCH       PICTURE IS X      USAGE IS DISPLAY
                                              VALUE IS 'N'.
    88  AGR-SIGNON-NOT-DONE    USAGE IS CONDITION-NAME
                                                 VALUE IS 'N'.
    88  AGR-SIGNON-OK    USAGE IS CONDITION-NAME VALUE IS 'Y'.
03  AGR-DIALOG-NAME         PICTURE IS X(8)   USAGE IS DISPLAY.
03  AGR-FUNC-DESCRIPTION    PICTURE IS X(28)  USAGE IS DISPLAY.
03  AGR-MESSAGE             PICTURE IS X(240) USAGE IS DISPLAY.
03  AGR-SIGNON-REQMTS       PICTURE IS X      USAGE IS DISPLAY.
    88  AGR-SIGNON-REQUIRED    USAGE IS CONDITION-NAME
                                                 VALUE IS 'R'.
    88  AGR-SIGNON-OPTIONAL    USAGE IS CONDITION-NAME
                                                 VALUE IS 'O'.
    88  AGR-SIGNON-NOT-ALLOWED USAGE IS CONDITION-NAME
                                                 VALUE IS 'N'.
03  AGR-MAP-RESPONSE        PICTURE IS X(8)   USAGE IS DISPLAY.
03  FILLER                  PICTURE IS X(54)  USAGE IS DISPLAY.
```

12.2 ADSO-APPLICATION-MENU-RECORD

```
01  ADSO-APPLICATION-MENU-RECORD.
    03  AMR-PAGE             PICTURE IS S99     USAGE IS COMP.
    03  AMR-TOTAL-PAGES      PICTURE IS S99     USAGE IS COMP.
    03  AMR-NEXT-PAGE        PICTURE IS S99     USAGE IS COMP.
    03  AMR-HEADING          PICTURE IS X(237)  USAGE IS DISPLAY.
    03  AMR-HDG REDEFINES AMR-HEADING           USAGE IS DISPLAY.
        05  AMR-HL1          PICTURE IS X(79)   USAGE IS DISPLAY.
        05  AMR-HL2          PICTURE IS X(79)   USAGE IS DISPLAY.
        05  AMR-HL3          PICTURE IS X(79)   USAGE IS DISPLAY.
    03  AMR-DATE             PICTURE IS X(8)    USAGE IS DISPLAY.
    03  AMR-DIALOG           PICTURE IS X(8)    USAGE IS DISPLAY.
    03  AMR-RESPONSE-FIELD   PICTURE IS X(8)    USAGE IS DISPLAY.
    03  AMR-MODE             PICTURE IS X(4)    USAGE IS DISPLAY.
    03  AMR-PASSING          PICTURE IS X(32)   USAGE IS DISPLAY.
    03  AMR-USER-ID          PICTURE IS X(32)   USAGE IS DISPLAY.
    03  AMR-PASSWORD         PICTURE IS X(8)    USAGE IS DISPLAY.
    03  AMR-SELECT-SECTION   USAGE IS DISPLAY   OCCURS 50 TIMES.
        05  AMR-SELECT       PICTURE IS X       USAGE IS DISPLAY.
        05  AMR-RESPONSE     PICTURE IS X(8)    USAGE IS DISPLAY.
        05  AMR-KEY          PICTURE IS X       USAGE IS DISPLAY.
        05  AMR-DESCRIPTION  PICTURE IS X(28)   USAGE IS DISPLAY.
```

12.3 ADSO-STAT-DEF-REC

```
ADSO-STAT-DEF-REC.
02   ERROR-STATUS                        PIC 9(4).
     88   DB-STATUS-OK                   VALUE '0000'.
     88   DB-END-OF-SET                  VALUE '0307'.
     88   DB-REC-NOT-FOUND               VALUE '0326'.
     88   DB-END-OF-INDEX                VALUE '1707'.
     88   DB-INDEX-NOT-FOUND             VALUE '1726'.
     88   SCRATCH-AREA-NOT-FOUND         VALUE '4303'.
     88   SCRATCH-REC-NOT-FOUND          VALUE '4305'.
     88   SCRATCH-REC-REPLACED           VALUE '4317'.
     88   QUEUE-ID-NOT-FOUND             VALUE '4404'.
     88   QUEUE-REC-NOT-FOUND            VALUE '4405'.
     88   DB-ANY-ERROR                   VALUE '0001'
                                         THRU  '9999'.
```

Chapter 13. Error Status Codes

13.1 Autostatus Return Codes

Status Code	Meaning
0000	The request was executed successfully.
0307	An end-of-set condition was encountered.
0326	The requested record cannot be found.
1707	An end-of-index condition was encountered.
1726	The requested index record cannot be found.
4303	The requested scratch area cannot be found.
4305	The requested scratch record cannot be found.
4317	A request to replace a scratch record was executed successfully.
4404	The requested queue id cannot be found.
4405	The requested queue record cannot be found.
5149	NOWAIT was specified in a KEEP LONGTERM request, and a wait is required.

13.2 Default Level-88 Values

Status Code	Condition Name
0000	DB-STATUS-OK
0307	DB-END-OF-SET
0326	DB-REC-NOT-FOUND
1707	DB-END-OF-INDEX
1726	DB-INDEX-NOT-FOUND
4303	SCRATCH-AREA-NOT-FOUND
4305	SCRATCH-REC-NOT-FOUND
4317	SCRATCH-REC-REPLACED
4404	QUEUE-ID-NOT-FOUND
4405	QUEUE-REC-NOT-FOUND
0001 THRU 9999	DB-ANY-ERROR

13.3 Major DB Status Codes

Code	Database Function
00	Any DML statement
01	FINISH
02	ERASE
03	FIND/OBTAIN
05	GET
06	KEEP
07	CONNECT
08	MODIFY
09	READY
11	DISCONNECT
12	STORE
14	BIND
15	ACCEPT
16	IF
17	RETURN
18	COMMIT
19	ROLLBACK
20	LRF requests

13.4 Minor DB Status Codes

Code	Database Function Status
00	Combined with a major code of 00, this code indicates successful completion of the DML operation. Combined with a non-zero major code, this code indicates that the DML operation was not completed successfully due to central version causes, such as time-outs and program checks.
01	An area has not been readied. When this code is combined with a major code of 16, an IF operation has resulted in a valid false condition.
02	Either the db-key used with a FIND/OBTAIN DB-KEY statement or the direct db-key suggested for a STORE is not within the page range for the specified record name.
04	The occurrence count of a variably occurring element has been specified as either less than zero or greater than the maximum number of occurrences defined in the control element.
05	The specified DML function would have violated a duplicates-not-allowed option for a CALC, sorted or index set.
06	No currency has been established for the named record, set or area.
07	The end of a set, area or index has been reached or the set is empty.
08	The specified record, set, procedure or LR verb is not in the subschema or the specified record is not a member of the set.
09	The area has been readied with an incorrect usage mode.
10	An existing access restriction or subschema usage prohibits execution of the specified DML function. For LRF users, the subschema in use allows access to database records only. Combined with a major code of 00, this code means the program has attempted to access a database record, but the subschema in use allows access to logical records only.
11	The record cannot be stored in the specified area due to insufficient space.
12	There is no db-key for the record to be stored. This is a system internal error and should be reported.
13	A current record of run unit either has not been established or has been nullified by a previous ERASE statement.
14	The CONNECT statement cannot be executed because the requested record has been defined as a mandatory automatic member of the set.
15	The DISCONNECT statement cannot be executed because the requested record has been defined as a mandatory member of the set.
16	The record cannot be connected to a set of which it is already a member.

Code	Database Function Status
18	The record has not been bound.
20	The current record is not the same type as the specified record name.
21	Not all areas being used have been readied in the correct usage mode.
22	The record name specified is not currently a member of the set name specified.
23	The area name specified is either not in the subschema or not an extent area; or the record name specified has not been defined within the area name specified.
25	No currency has been established for the named set.
26	No duplicates exist for the named record or the record occurrences cannot be found.
28	The run unit has attempted to ready an area that has been readied previously.
29	The run unit has attempted to place a lock on a record that is locked already by another run unit. A deadlock results. Unless the run unit issued either a FIND/OBTAIN KEEP EXCLUSIVE or a KEEP EXCLUSIVE, the run unit is aborted.
30	An attempt has been made to erase the owner record of a nonempty set.
31	The retrieval statement format conflicts with the record's location mode.
32	An attempt to retrieve a CALC/DUPLICATE record was unsuccessful; the value of the CALC field in variable storage is not equal to the value of the CALC control element in the current record of run unit.
33	At least one set in which the record participates has not been included in the subschema.
40	The WHERE clause in an OBTAIN NEXT logical-record request is inconsistent with a previous OBTAIN FIRST or OBTAIN NEXT command for the same record. Previously specified criteria, such as reference to a key field, have been changed. A path status of LR-ERROR is returned to the LRC block.
41	The subschema contains no path that matches the WHERE clause in a logical-record request. A path status of LR-ERROR is returned to the LRC block.
42	An ON clause included in the path by the DBA specified return of the LR-ERROR path status to the LRC block; an error has occurred while processing the LRF request.

Code	Database Function Status
43	A program check has been recognized during evaluation of a WHERE clause; the program check indicates that either a WHERE clause has specified comparison of a packed decimal field to an unpacked nonnumeric data field, or data in variable storage or a database record does not conform to its description. A path status of LR-ERROR is returned to the LRC block unless the DBA has included an ON clause to override this action in the path.
44	The WHERE clause in a logical-record request does not supply a key element (sort key, CALC key or db-key) expected by the path. A path status of LR-ERROR is returned to the LRC block.
45	During evaluation of a WHERE clause, a program check has been recognized because a subscript value is neither greater than 0 nor less than its maximum allowed value plus one. A path status of LR-ERROR is returned to the LRC block unless the DBA has included an ON clause to override this action in the path.
46	A program check has revealed an arithmetic exception (for example: overflow, underflow, significance, divide) during evaluation of a WHERE clause. A path status of LR-ERROR is returned to the LRC block unless the DBA has included an ON clause to override this action in the path.
53	The subschema definition of an indexed set does not match the indexed set's physical structure in the database.
54	Either the prefix length of an SR51 record is less than zero or the data length is less than or equal to zero.
55	An invalid length has been defined for a variable-length record.
56	An insufficient amount of memory to accommodate the CA-IDMS/DB compression/decompression routines is available.
60	A record occurrence type is inconsistent with the set named in the ERROR-SET field in the IDMS communications block. This code usually indicates a broken chain.
61	No record can be found for an internal db-key. This code usually indicates a broken chain.
62	A system-generated db-key points to a record occurrence, but no record with that db-key can be found. This code usually indicates a broken chain.
63	The DBMS cannot interpret the DML function to be performed. When combined with a major code of 00, this code means invalid function parameters have been passed on the call to the DBMS. For LRF users, a WHERE clause includes a keyword that is longer than the 32 characters allowed.

Code	Database Function Status
64	The record cannot be found; the CALC control element has not been defined properly in the subschema.
65	The database page read was not the page requested.
66	The area specified is not available in the requested usage mode.
67	The subschema invoked does not match the subschema object tables.
68	The CICS interface was not started.
69	A BIND RUN-UNIT may not have been issued; the CV may be inactive or not accepting new run units; or the connection with the CV may have been broken due to time out or other factors. When combined with a major code of 00, this code means the program has been disconnected from the DBMS.
70	The database will not ready properly; a JCL error is the probable cause.
71	The page range or page group for the area being readied or the page requested cannot be found in the DMCL.
72	There is insufficient memory to dynamically load a subschema or database procedure.
73	A central version run unit will exceed the MAXERUS value specified at system generation.
74	The dynamic load of a module has failed. If operating under the central version, a subschema or database procedure module either was not found in the data dictionary or the load (core image) library or, if loaded, will exceed the number of subschema and database procedures provided for at system generation.
75	A read error has occurred.
76	A write error has occurred.
77	The run unit has not been bound or has been bound twice. When combined with a major code of 00, this code means either the program is no longer signed on to the subschema or the variable subschema tables have been overwritten.
78	An area wait deadlock has occurred.
79	The run unit has requested more db-key locks than are available to the system.
80	The target node is either not active or has been disabled.
81	The converted subschema requires specified database name to be in the DBNAME table.
82	The subschema must be named in the DBNAME table.
83	An error has occurred in accessing native VSAM data sets.

Code	Database Function Status
87	The owner and member records for a set to be updated are not in the same page group or do not have the same db-key radix.
91	The subschema requires a DBNAME to do the bind run unit.
92	No subschema areas map to DMCL.
93	A subschema area symbolic was not found in DMCL.
94	The specified dbname is neither a dbname defined in the DBNAME table, nor a SEGMENT defined in the DMCL.
95	The specified subschema failed DBTABLE mapping using the specified dbname.

13.5 Major DC Status Codes

Code	CA-IDMS/DC Function
00	Any DML statement
30	TRANSFER CONTROL
31	WAIT/POST
32	GET STORAGE/FREE STORAGE
33	SET ABEND EXIT/ABEND CODE
34	LOAD/DELETE TABLE
35	GET TIME/SET TIMER
36	WRITE LOG
37	ATTACH/CHANGE PRIORITY
38	BIND/ACCEPT/END TRANSACTION STATISTICS
39	ENQUEUE/DEQUEUE
40	SNAP
43	PUT/GET/DELETE SCRATCH
44	PUT/GET/DELETE QUEUE
45	BASIC MODE TERMINAL MANAGEMENT
46	MAPPING MODE TERMINAL MANAGEMENT
47	LINE MODE TERMINAL MANAGEMENT
48	ACCEPT/WRITE PRINTER
49	SEND MESSAGE
50	COMMIT TASK/ROLLBACK TASK/FINISH TASK/WRITE JOURNAL
51	KEEP LONGTERM

13.6 Minor DC Status Codes

Code	CA-IDMS/DC Function Status
00	Combined with a major code of 00, this code indicates either successful completion of the DML function or that all tested resources have been enqueued.
01	The requested operation cannot be performed immediately; waiting will cause a deadlock.
02	Either there is insufficient storage in the storage pool or the storage required for control blocks is unavailable.
03	The scratch area ID cannot be found.
04	Either the queue ID (header) cannot be found or a paging session was in progress when a second STARTPAGE command was received (that is, an implied ENDPAGE was processed before this STARTPAGE was executed successfully).
05	The specified scratch record ID or queue record cannot be found.
06	No resource control element (RCE) exists for the queue record; currency has not been established.
07	Either an I/O error has occurred or the queue upper limit has been reached.
08	The requested resource is not available.
09	The requested resource is available.
10	New storage has been assigned.
11	A maximum task condition exists.
12	The named task code is invalid.
13	The named resource cannot be found.
14	The requested module is defined as nonconcurrent and is currently in use.
15	The named module has been overlaid and cannot be reloaded immediately.
16	The specified interval control element (ICE) address cannot be found.
17	The record has been replaced.
18	No printer terminals have been defined for the current CA-IDMS/DC system.
19	The return area is too small; data has been truncated.
20	An I/O, program-not-found, or potential-deadlock status condition exists.

Code	CA-IDMS/DC Function Status
21	The message destination is undefined, the longterm ID cannot be found, or a KEEP LONGTERM request was issued by a nonterminal task.
22	A record already exists for the scratch area specified.
23	No storage or resource control element (RCE) could be allocated for the reply area.
24	The maximum number of outstanding replies has been exceeded.
25	An attention interrupt has been received.
26	There is a logical error in the output data stream.
27	A permanent I/O error has occurred.
28	The terminal dial-up line is disconnected.
29	An invalid parameter has been passed in the list set up by the DML processor.
30	The named function has not yet been implemented.
31	An invalid parameter has been passed; the TRB, LRB or MRB contains an invalid field; or the request is invalid because of a possible logic error in the application program. In a DC-BATCH environment, a possible cause is that the record length specified by the command exceeds the maximum length based on the packet size.
32	The derived length of the specified variable storage is negative or zero.
33	Either the named table or the named map cannot be found in the data dictionary load area.
34	The named variable-storage area must be an 01-level entry in the LINKAGE SECTION.
35	A GET STORAGE request is invalid because the LINKAGE SECTION variable has already been allocated.
36	The program either was not defined during CA-IDMS/DC sysgen or is marked out-of-service.
37	A GET STORAGE operand is invalid because the specified variable storage area is in the WORKING-STORAGE SECTION instead of the LINKAGE SECTION.
38	Either no GET STORAGE operand was specified or the specified LINKAGE SECTION variable has not been allocated.
39	The terminal device being used is out of service.
40	NOIO has been specified but the datastream cannot be found.
41	An IF operation resulted in a valid true condition.
42	The named map does not support the terminal device in use.

Code	CA-IDMS/DC Function Status
43	A line I/O session has been canceled by the terminal operator.
44	The referenced field does not participate in the specified map; a possible cause is an invalid subscript.
45	An invalid terminal type is associated with the issuing task.
46	A terminal I/O error has occurred.
47	The named area has not been readied.
48	The run unit has not been bound.
49	NOWAIT has been specified but WAIT is required.
50	Statistics are not being kept.
52	The specified table is missing or invalid.
53	An error occurred from a user-written edit routine.
54	Either there is invalid internal data or a data conversion error has occurred.
55	The user-written edit routine cannot be found.
56	No DFLDS have been defined for the map.
57	The ID cannot be found, is not a long-term permanent ID, or is being used by another run unit.
58	Either the LRID cannot be found or the maximum number of concurrent task threads was exceeded.
63	Invalid function parameters have been passed on the call to the DBMS.
64	No detail exists currently for update; no action has been taken. Alternatively, the requested node for a header or detail is either not present or not updated.
68	There are no more updated details to MAP IN or the amount of storage defined for pageable maps at sysgen is insufficient. In the latter case, subsequent MAP OUT DETAIL statements are ignored.
69	A DC-BATCH task requires more buffer space than was requested in the BIND TASK statement.
72	No detail occurrence, footer or header fields exist to be mapped out by a MAP OUT RESUME command, or the scratch record that contains the requested detail could not be accessed. The latter case is a mapping internal error and should be reported.
76	The first screen page has been transmitted to the terminal.
77	Either the program is no longer signed on to the subschema or the variable subschema tables have been overwritten.

Code	CA-IDMS/DC Function Status
80	The target node is either not active or has been disabled.
96	There are too many active run units for the internal table.
97	An invalid status has been received from DBIO/DBMS; check the CA-IDMS/DC log file for details.
98	An unsupported COBOL compiler option (for example, DEBUG) may have been specified.
99	An unexpected internal return code has been received; the terminal device is out of service.

13.7 ERROR-STATUS Condition Names

Code	Condition Name	Explanation
0000	DB-STATUS-OK	No error
0307	DB-END-OF-SET	End of set, area or SPF index
0326	DB-REC-NOT-FOUND	No record found
0001 to 9999	ANY-ERROR-STATUS	Any non-zero status
0000 to 9999	ANY-STATUS	Any status
3101 3201 3401 3901	DC-DEADLOCK	Waiting will cause a deadlock
3202 3402	DC-NO-STORAGE	Insufficient space available
4303	DC-AREA-ID-UNK	ID cannot be found
4404	DC-QUEUE-ID-UNK	Queue header cannot be found
4305 4405	DC-REC-NOT-FOUND	Record cannot be found
3908	DC-RESOURCE-NOT-AVAIL	Resource not available
3909	DC-RESOURCE-AVAIL	Resource is available
3210	DC-NEW-STORAGE	New space allocated
3711	DC-MAX-TASKS	Maximum attached tasks
4317	DC-REC-REPLACED	Record has been replaced
4319 4419 4519 4719	DC-TRUNCATED-DATA	Return area too small
4525 4625	DC-ATTN-INT	Attention interrupt received
4743	DC-OPER-CANCEL	Session canceled

Chapter 14. SYSIDMS Parameters

For more information on SYSIDMS parameters, refer to the *CA-IDMS Database Administration Guide*.

Chapter 15. Online Debugger Syntax

15.1 Debugger Symbols

General Registers and the PSW: **General registers** include the registers used by the program at the time of execution and the registers used by the DC/UCF system. The program status word (PSW) and register definitions are always preceded by a colon (:) and are specified by these symbols:

- **:PSW** for the current program status word
- **:R*n*** for the user program register at the time of interrupt, where *n* represents the number of the register and can have a value of 0 through 15
- **:REGS** for all user program registers at the time of interrupt
- **:SR*n*** for a DC/UCF system register at the time of interrupt, where *n* represents the number of the register and can have a value of 0 through 15
- **:SREGS** for all DC/UCF system registers at the time of interrupt

DC/UCF System Symbols

:BAT	Base address table for session
:CSA	DC/UCF common storage area
:DLB	Debug local block, control block required for debugging session
:LTE	Current logical terminal element
:PTE	Current physical terminal element
:TCE	Current task control element
:VECT	Vector table for debugger

Address Symbols and Markers

Symbol	Symbol Name	Designated Location
@	At sign	Absolute address
$	Dollar sign	Load address
¢	Cent sign	Address of current dialog process

15.2 User Symbols

- **:DR*n*** for a debugger general register, where *n* represents the number of the register and can have a value of 0 through 15
- **:DREGS** for all debugger registers
- **:H1** and **:H2** for halfword 1 and halfword 2
- **:F1** and **:F2** for fullword 1 and fullword 2
- **:UCHR** for a 48-byte character area

  You can also refer to specified sections of this area:

  – **:UC0**, the first 16 bytes

  – **:UC16**, the next 16 bytes

  – **:UC32**, the last 16 bytes

15.3 Program Symbols

Data Field Names

```
►►── data-field-name ┬──────────────────────────────────────────►◄
                     ├─ IN ─┬─ record-name ─┤
                     └─ OF ─┘               │
```

Line Numbers

```
►►── # line-number ──────────────────────────────────────────►
 ►─┬──────────────────────────────────────────────────────────►◄
   │                                                          │
   └─┬─ IN ─┬─┬─ current-process-name ──────────────────────┬─┤
     └─ OF ─┘ │                                            │ │
              └─ included-module-name ─┬──────────────────┬─┘ │
                                       └─ OCCurrence occurrence-number ─┘
```

Qualifying Program Symbols

```
►►── process-name - . - program-symbol ──────────────────────►◄
```

15.4 Expression Operators

Operator	Meaning
+	Addition
-	Subtraction
*	Multiplication
/	Division

15.5 Delimiters

*	Asterisk
	Blank
,	Comma
=	Equal sign
!	Exclamation point
-	Hyphen
%	Percent sign
.	Period
+	Plus sign
/	Slash

15.6 Debugger Commands

AT

```
►►── AT debug-expression ──────────────────────────────────────►
►─┬──────────────────────────────────────────────────────────────┬──────────────────────────────────────►
  │ BEFore ─┬─ MAXimum ◄ ──────────┬│ AFTer ─┬─ 0 ◄ ──────────────┬│
  │         └─ execution-count ────┘│        └─ execution-count ───┘│
►─┬──────────────────────────────────────────────────────────────┬──────────────────────────────────────►◄
  │ EVEry ─┬─ 1 ◄ ──────────────┬│ ├─ ON ◄ ──┤│
  │        └─ execution-count ──┘│ └─ IGNore ─┘│
►►── AT ─┬─ ALL ──────────────┬─┬─ INQuire ──┬──────────────────────►◄
          └─ debug-expression ─┘ │ ON ────────┤
                                 │ IGNore ────┤
                                 └ OFF ───────┘
```

DEBUG

```
►►── DEBug ─┬─ PROgram ◄ ─┬─ entity-name ─┬──────────────────────────►◄
           │ DIAlog ─────┤               └─ VERsion version-number ─┘
           │ MAP ────────┤
           │ SS ─────────┤
           └ TABle ──────┘
►►── DEBug ─┬─ entity-name ─┬──────────────────────┬─┬─ INQuire ─┬──►◄
           │               └─ VERsion version-number ─┘│ OFF ──────┤
           └ ALL ──────────────────────────────────────┘
```

EXIT

```
►►── EXIt ──────────────────────────────────────────────────────►◄
```

IOUSER

```
►►── IOUser ────────────────────────────────────────────────────►◄
```

LIST

```
►►─┬─ List ────┬─┬──────────── begin-debug-expression ──────────►
   └─ Display ─┘ └─ Memory ─┘
►─┬──────────────────────────────────────────────────────────────┬──────────────────────────────────────►◄
  │ TO end-debug-expression ──────────┬│ ├─ C ─┤│
  │                                   │ ├─ X ─┤│
  │ LENgth ─┬─ byte-count-number ─────┘│ └─ XC ─┘│
►►─┬─ List ────┬─ SESsion ATTributes ──────────────────────────►◄
   └─ Display ─┘
```

MENU

```
►►── MENu ─┬──────────────────────────────────────────────────────►◄
           └─ screen-name ─┘
```

PROMPT

```
►►── PROmpt ──────────────────────────────────────────────────►◄
```

QUALIFY

```
►►── QUAlify ┬──────────────────────┬── PROCess process-name ──────────►
           └─ DIAlog dialog-name ─┘

►┬──────────────────────────────┬──────────────────────────────────►◄
 └─ VERsion version-number ─┘

►►── QUAlify INQuire ──────────────────────────────────────────────►◄
```

QUIT

```
►►── QUIt ──────────────────────────────────────────────────────────►◄
```

RESUME

```
►►── RESume ┬──────────────────────────────────────────────────────►◄
           │                   ┬─ debug-expression ─┬
           └─ AT ─┘            └─ ABEnd ────────────┘
```

SET

```
►►┬─ Set ──┬──────────┬── debug-expresssion ┬──────────────────────►
  └─ Vary ─┘          └─ Memory ─┘          ├─ EQUals ─┤
                                            └─ = ───────┘

►┬─ data-field-name ──┬┬──────────┬┬──────────────┬──────────────►◄
 ├─ H halfword ────────┤├─ C ─────┤├─ RESEt ──────┤
 ├─ F fullword ────────┤├─ X ─────┤└─ NOReset ◄ ─┘
 ├─ X hex-value ───────┤└─ XC ────┘
 ├─ C character-string ┤
 └─ P packed-value ────┘

►►── Set ┬─ CHAr ─┬──────────────────────────────────────────────►◄
        ├─ HEX ──┤
        └─ BOTh ─┘
```

SNAP

```
►►── SNAp ┬─ TASk ──────────────────────────────────────────────────┬──►
        └─ begin-debug-expression ┬──────────────────────────────┬
                                  ├─ TO end-debug-expression ────┤
                                  ├──────────────┬─ byte-count-number ─┤
                                  └─ LENgth ─────┘

►┬──────────────────────────┬──────────────────────────────────►◄
 └─ TITle title ─────────────┘
```

WHERE

```
►►── WHEre ──────────────────────────────────────────────────────────►◄
```