

WRDC-TR-90-8007
Volume V
Part 24



AD-A250 461



INTEGRATED INFORMATION SUPPORT SYSTEM (IISS)
Volume V - Common Data Model Subsystem
Part 24 - Neutral Data Manipulation Language (NDML) Precompiler
Generator Support Routines Product Specification

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September 1990

Final Report for Period 1 April 1987 - 31 December 1990

Approved for Public Release; Distribution is Unlimited

92-13580



MANUFACTURING TECHNOLOGY DIRECTORATE
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SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE				
1a. REPORT SECURITY CLASSIFICATION Unclassified		1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY		3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for Public Release; Distribution is Unlimited.		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE				
4. PERFORMING ORGANIZATION REPORT NUMBER(S) PS 620341260		5. MONITORING ORGANIZATION REPORT NUMBER(S) WRDC-TR-90-8007 Vol. V, Part 24		
6a. NAME OF PERFORMING ORGANIZATION Control Data Corporation; Integration Technology Services		6b. OFFICE SYMBOL (if applicable) WRDC/MTI		7a. NAME OF MONITORING ORGANIZATION WRDC/MTI
6c. ADDRESS (City, State, and ZIP Code) 2970 Presidential Drive Fairborn, OH 45324-6209		7b. ADDRESS (City, State, and ZIP Code) WPAFB, OH 45433-6533		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Wright Research and Development Center, Air Force Systems Command, USAF		8b. OFFICE SYMBOL (if applicable) WRDC/MTI		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUM. F33600-87-C-0464
8c. ADDRESS (City, State, and ZIP Code) Wright-Patterson AFB, Ohio 45433-6533		10. SOURCE OF FUNDING NOS.		
11. TITLE See block 19		PROGRAM ELEMENT NO. 78011F	PROJECT NO. 595600	TASK NO. F95600 WORK UNIT NO. 20950607
12. PERSONAL AUTHOR(S) Control Data Corporation: Apicella, M. L., Slaton, J., Levi, B., Pashak, A.				
13a. TYPE OF REPORT Final Report	13b. DATE COVERED 4 / 1 57-12 / 31 / 90	14. DATE OF REPORT (Yr., Mo., Day) 1990 September 30		15. PAGE COUNT 69
16. SUPPLEMENTARY NOTATION WRDC/MTI Project Priority 6203				
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify block no.)		
FIELD	GROUP	SUB GR.		
1308	0905			
19. ABSTRACT (Continue on reverse if necessary and identify block number) This specification establishes the design of Function PRE9.1, "Request Processor Generator Support Routines", one of the major functions of the Configuration Item (CI) "Precompiler" to be built and formally accepted by the ICAM program office. BLOCK 11: INTEGRATED INFORMATION SUPPORT SYSTEM Vol V - Common Data Model Subsystem Part 24 - Neutral Data Manipulation Language (NDML) Precompiler Generator Support Routines Product Specification				
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT UNCLASSIFIED/UNLIMITED x SAME AS RPT. DTIC USERS		21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL David L. Judson		22b. TELEPHONE NO. (Include Area Code) (513) 255-7371		22c. OFFICE SYMBOL WRDC/MTI

EDITION OF 1 JAN 73 IS OBSOLETE

DD FORM 1473, 83 APR

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE

FOREWORD

This technical report covers work performed under Air Force Contract F33600-87-C-0464, DAPro Project. This contract is sponsored by the Manufacturing Technology Directorate, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Bruce A. Rasmussen, Branch Chief, Integration Technology Division, Manufacturing Technology Directorate, through Mr. David L. Judson, Project Manager. The Prime Contractor was Integration Technology Services, Software Programs Division, of the Control Data Corporation, Dayton, Ohio, under the direction of Mr. W. A. Osborne. The DAPro Project Manager for Control Data Corporation was Mr. Jimmy P. Maxwell.

The DAPro project was created to continue the development, test, and demonstration of the Integrated Information Support System (IISS). The IISS technology work comprises enhancements to IISS software and the establishment and operation of IISS test bed hardware and communications for developers and users.

The following list names the Control Data Corporation subcontractors and their contributing activities:

<u>SUBCONTRACTOR</u>	<u>ROLE</u>
Control Data Corporation	Responsible for the overall Common Data Model design development and implementation, IISS integration and test, and technology transfer of IISS.
D. Appleton Company	Responsible for providing software information services for the Common Data Model and IDEF1X integration methodology.
ONTEK	Responsible for defining and testing a representative integrated system base in Artificial Intelligence techniques to establish fitness for use.
Simpact Corporation	Responsible for Communication development.
Structural Dynamics Research Corporation	Responsible for User Interfaces, Virtual Terminal Interface, and Network Transaction Manager design, development, implementation, and support.
Arizona State University	Responsible for test bed operations and support.

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SECTION 1

SCOPE

1.1 Identification

This specification establishes the design of Function PRE9.1, "Request Processor Generator Support Routines", one of the major functions of the Configuration Item (CI) "Precompiler" to be built and formally accepted by the ICAM Program Office. This CI constitutes one of the subsystems of the Common Data Model Processor (CDMP).

1.2 Functional Summary

The purpose of this Computer Program Configuration Item (CPCI) is to provide code generation support functions to the CDMP Request Processor generators.

The following functions will be performed by this CPCI:

1. Generate working storage and procedure division code for the conceptual schema to internal schema transformation of runtime search parameters and update values (CDCI).
2. Combine two work files into one file containing the Request Processor program (CDCWF).
3. Generate working storage and procedure division code for the internal schema to conceptual schema transformation of retrieved data fields (CDIC).
4. Generate macro code with the proper substitution parameters (CDMACR).
5. Generate conceptual schema data definitions for runtime search parameters and update values (CDMSG).
6. Generate internal schema data definitions for runtime search parameters (CDPRM).
7. Generate internal schema data definitions for qualified data fields (CDQDF).
8. Generate internal schema data definitions for retrieved data fields (CDRDF).
9. Generate conceptual schema data definitions for retrieved data fields (CDRFT).
10. Generate working storage data definitions for run time complex mapping algorithm parameters (CDCMPRM).
11. Generate a COBOL working storage record layout for a specified record type (CDGENRT).

12. Generate user defined null variable names and picture clauses (CDGNV).
13. Generate working storage indicator definitions in support of conceptual evaluation for deletes and modifies (CDGYU).
14. Retrieval from the CDM internal schema meta data (type, size, and number of decimals) for a specified data field (CDIMD).
15. Generate FORTRAN parameter variable initialization (CDPOOL).
16. Convert an NDML operator into the COBOL equivalent (CDQPOP).
17. Generate an "IF" statement that will evaluate conceptually user qualifications contained in a WHERE clause (CDRPCIF).
18. Generate an "IF" statement that will evaluate internally user qualifications contained in a WHERE clause (CDRPIIF).
19. Generate an "IF" statement that will evaluate record union discriminator qualification for a specified record type (CDRPUIF).
20. Retrieve from the CDM all datafield information for a specified record type (RETFLDS).

SECTION 2

DOCUMENTS

2.1 Reference Documents

1. ICAM Documentation Standards: IDS15012000A, 28 December 1981.
2. D. Appleton Co., CDM Administrators Manual: UM620141000, March 1984.
3. D. Appleton Co., CDM1-IDEF, Model of the Common Data Model: CCS620141000, 15 May 1985.
4. D. Appleton Co., Computer Program Development Specification (DS) for ICAM Integrated Support System (IISS) Configuration Item: NDML Precompiler: DS620141200, October 1984.
5. D. Appleton Co., Embedded NDML Programmer's Reference Manual: PRM620141200, March 1985.
6. Softech, Inc., NTM Programmer's Guide: UM620140001, July 1984.
7. Control Data Corporation, Computer Program Development Specification (DS) for ICAM Integrated Support System (IISS) Configuration Item: NDDL Command Processor; DS620141100, June 1985.

2.2 Terms and Abbreviations

Attribute Use Class: (AUC)

Conceptual Schema: (CS)

Common Data Model Processor: (CDMP)

Common Data Model: (CDM) Describes common data application process formats, form definitions, etc., of the IISS and includes conceptual schema, external, internal schemas, and schema transformation operators.

Data Field: (DF) An element of data in the external schema. It is by this name that an NDML programmer references data.

Database Management System: (DBMS)

Distributed Request Supervisor: (DRS) This IISS CDM subsystem configuration item controls the execution of distributed NDML queries and non distributed updates.

Domain: A logical definition of legal attribute class values.

Domain Constraint: Predicate that applies to a single domain.

External Schema: (ES)

Forms: Structured views that may be imposed on windows or other forms. A form is composed of fields where each field is a form, item, or window.

Forms Processor: (FP) A set of callable execution time routines available to an application program for form processing.

Internal Schema: (IS)

Integrated Information Support System: (IISS) A test computing environment used to investigate, demonstrate and test the concepts of information management and information integration in the context of Aerospace Manufacturing. The IISS addresses the problems of integration of data resident on heterogeneous databases supported by heterogeneous computers interconnected via a local Area Network.

Mapping: The correspondence of independent objects in two schemas: ES to CS or CS to IS.

Network Transaction Manager: (NTM) Performs the coordination, communication and housekeeping functions required to integrate the application processes and system services resident on the various hosts into a cohesive system.

Neutral Data Manipulation Language: (NDML) A language developed by the IISS project to provide uniform access to common data, regardless of database manager or distribution criteria. It provides distributed retrieved and single node updates.

ORACLE: Relational DBMS based on the SQL (Structured Query Language, a product of ORACLE Corp, Menlo Park, CA). The CDM is an ORACLE database.

Parcel: A sequential file containing sections source code of the input application program.

Request Processor: (RP) A COBOL program that will satisfy a retrieval or update NDML subtransaction against a particular Database Management System.

User Interface: (UI) Controls the user's terminal and interfaces with the rest of the system.

Virtual Terminal Interface: (VTI) Performs the interfacing between different terminals and the UI. This is done by defining a specific set of terminal features and protocols which must be supported by UI software which constitutes the Virtual Terminal Definition. Specific terminals are then mapped against the Virtual Terminal software by specific software modules_ written for each type of real terminal supported.

SECTION 3

REQUIREMENTS

3.1 Structural Description

The graphic portrayal of this CPCI is included in Section 3.10. This chart shows the hierarchical relationship of each module making up this CPCI.

Each code generation support function is contained in a single COBOL module identified in Section 1.2 of this document. A separate module CDPIC is used by some of the support functions to generate a COBOL picture clause for program variables.

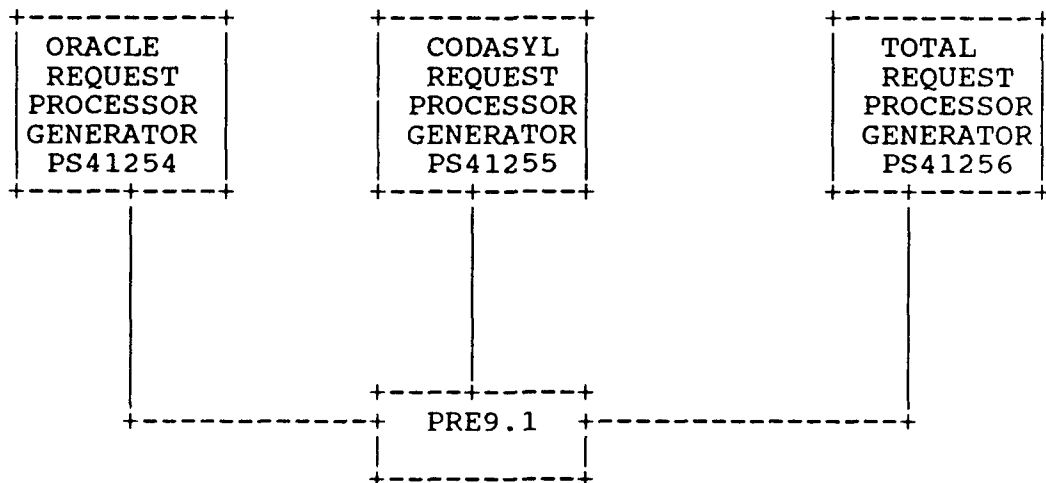
3.2 Functional Flow

This CPCI implemented the logic defined in the Development Specification for this CPCI. Details of inputs/outputs and relationships between modules are found in Section 3.10.

This CPCI has been designated to operate in a batch or interactive mode. It must operate in the system environment established for IISS; that is, the Network Transaction Manager. It currently can only be executed on the DEC VAX due to the dependence on the VAX sort although this can be changed for execution on the IBM.

3.3 Interfaces

The following diagram depicts the interface of PRE9.1 with other CPCI's in the system.



3.3.1 Inputs/Outputs

The inputs and outputs of each module in this CPCI can be found in section 3.10. A detailed description for each item can be found in the DS for this CPCI.

3.4 Program Interrupts

Not applicable to the CPCI.

3.5 Timing and Sequencing Description

This CPCI is called upon by each Request Processor generator.

3.6 Special Control Features

Not applicable to this CPCI.

3.7 Storage Allocation

3.7.1 Database Definition

The database used by this CPCI is the Common Data Model (CDM) database. The model is defined by the CDM1 and the IDEF-1 model of the CDM, Reference Number 3.

3.7.1.1 File Description

No permanent files have been defined for this CPCI. It uses temporary scratch files for the generated program source code.

3.7.1.2 Table Description

All tables used by this CPCI have been defined by the Development Specification for this CPCI

3.7.1.3 Item Description

Not applicable to this CPCI.

3.8 Object Code Creation

The object code for this CPCI will be created by the system integration team using defined IISS Software Configuration Management procedures. This CPCI will use the COBOL language compiler.

3.9 Adaptation Data

This CPCI has been coded using ANSI COBOL language. The intent was to provide a transportable system. Any system environment supporting these languages, a virtual memory management schema, the COMM and NTM subsystems of IISS and the ORACLE Database Management System should be able to support this

CPCI. Every possible attempt has been made to localize and identify any machine or environment dependent modules through the original design of the IISS and application of Configuration Management Procedures.

3.10 Detail Design Description

The following sections have been computer generated for this CPCI.

3.10.1 Where Include File Used List

The following lists each include file in the documentation group and all the modules documented in this specification which include them. The purpose of each module is listed as well.

DOCGROUP PS41260 Where-include-file-used List

Include File -----	Module Name -----
ERRCDM	CDCI CDCMPRM CDCWF CDGENRT CDGNV CDGTV CDIC CDIMD CDMACR CDMSG CDMSG2 CDPOOL CDPRM CDQDF CDRDF CDRFT CDRPCIF CDRPIIF CDRPUIF RETFLDS
ERRFS	CDCI CDCMPRM CDCWF CDGENRT CDGNV CDGTV CDIC CDMACR CDMSG

DOCGROUP PS41260 Where-include-file-used List

Include File -----	Module Name -----
	CDMSG2
	CDPOOL
	CDPRM
	CDQDF
	CDRDF
	CDRFT
	CDRPCIF
	CDRPIIF
	CDRPUIF
MACDAT	
	CDCI
	CDIC
	CDMACR
SBSTLST	
	CDCI
	CDIC
	CDMACR
ISAL	
	CDCI
	CDGNV
	CDIC
	CDMSG
	CDMSG2
	CDPOOL
	CDRDF
ISQUAL	
	CDCI
	CDGNV
	CDGTV
	CDIC
	CDMSG

DOCGROUP PS41260 Where-include-file-used List

Include File -----	Module Name -----
	CDMSG2 CDPOOL CDPRM CDQDF CDRPCIF CDRPIIF CDRPUIF
CSAL	
	CDCI CDMSG CDMSG2 CDPOOL CDRPCIF
CSQUAL	
	CDCI CDGTV CDIC CDMSG CDMSG2 CDPOOL CDRPCIF
CMAT	
	CDCI CDCMPRM CDGNV CDGTV CDIC CDPRM CDQDF CDRDF
FORVAR	

DOCGROUP PS41260 Where-include-file-used List

Include File -----	Module Name -----
	CDCI
	CDCMPRM
	CDGENRT
	CDGNV
	CDGTV
	CDIC
	CDMSG
	CDMSG2
	CDPOOL
	CDPRM
	CDQDF
	CDRDF
	CDRFT
	CDRPCIF
ERRPRO	CDCI
	CDCMPRM
	CDCWF
	CDGENRT
	CDGNV
	CDGTV
	CDIC
	CDIMD
	CDMACR
	CDMSG
	CDMSG2
	CDPOOL
	CDPRM
	CDQDF
	CDRDF
	CDRFT

DOCGROUP PS41260 Where-include-file-used List

Include File -----	Module Name -----
	CDRPCIF
	CDRPIIF
	CDRPUIF
	RETFLDS
CHKCDM	
	CDCMPRM
	CDGENRT
	CDGNV
	CDGTV
	CDIMD
	CDRPCIF
	CDRPIIF
	CDRPUIF
TDFTBL	
	CDGENRT
	RETFLDS
RFTABLE	
	CDIC
	CDRFT
EOD	
	CDIMD
	CDMACR
	RETFLDS
COBOLOP	
	CDQPOP
ERRORST	
	CDQPOP
BOOLST	
	CDRPCIF
SUBBOOL	
	CDRPIIF

DOCGROUP PS41260 Where-include-file-used List

Include File -----	Module Name -----
	CDRPUIF

3.10.2 Where External Routine Used List

The following lists each external function or routine in the documentation group and all the documented modules which call it. The purpose of each module is listed as well.

DOCGROUP PS41260 Where-external-routine-used List

System Module -----	Module Name -----
CDGETOF	CDCI CDCMPRM CDGENRT CDGNV CDGTV CDIC CDMSG CDMSG2 CDPOOL CDPRM CDQDF CDRDF CDRFT CDRPCIF
OUTFIL	CDCI CDCMPRM CDCWF CDGENRT CDGNV CDGTV CDIC CDMACR CDMSG CDMSG2 CDPOOL CDPRM CDQDF CDRDF CDRFT

DOCGROUP PS41260 Where-external-routine-used List

System Module -----	Module Name -----
	CDRPCIF CDRPIIF CDRPUIF
ERRPRO	CDCI CDCMPRM CDCWF CDGENRT CDGNV CDGTV CDIC CDIMD CDMACR CDMSG CDMSG2 CDPOOL CDPRM CDQDF CDRDF CDRFT CDRPCIF CDRPIIF CDRPUIF RETFLDS
CDCREFO	CDCMPRM CDGENRT CDGNV CDGTV CDMSG CDMSG2

DOCGROUP PS41260 Where-external-routine-used List

System Module -----	Module Name -----
	CDPRM
	CDQDF
	CDRDF
	CDRFT
OPNFIL	
	CDCWF
INPFIL	
	CDCWF
CLSFIL	
	CDCWF
SQLSCA	
	CDIMD
	CDMACR
	RETFLDS
SQLBS1	
	CDIMD
	CDMACR
	RETFLDS
SQLSCH	
	CDIMD
	CDMACR
	RETFLDS
SQLSCC	
	CDIMD
	CDMACR
	RETFLDS
SQLTFL	
	CDIMD
SQLOPN	
	CDIMD
SQLSQ	

DOCGROUP PS41260 Where-external-routine-used List

System Module -----	Module Name -----
	CDIMD CDMACR RETFLDS
SQLADR	
	CDIMD CDMACR RETFLDS
SQLAB1	
	CDIMD CDMACR RETFLDS
SQLEXE	
	CDIMD CDMACR RETFLDS
SQLAD1	
	CDIMD CDMACR RETFLDS
SQLFCH	
	CDIMD CDMACR RETFLDS
SQLTOC	
	CDMACR RETFLDS
SQLCLS	
	CDMACR RETFLDS

3.10.3 Main Program Parts List

The following lists each Main Program in the documentation group and all the modules which are called either by that module itself or by any of the documented modules which it calls. It is possible for a non-main module to be listed more than once if it is called by multiple modules. The called modules, in this case known as program parts, are marked as to whether they are documented here. If so, the phrase "well-defined module" appears by the module name, if not it is an "external routine". The Purpose of the Main Program module is listed as well.

DOCGROUP PS41260 Main Program Parts List

Main Pgm Name -----	Module Name -----	Module Type -----
CDCI	CDMACR	Well-defined module
	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
CDCMPRM	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDPIC	Well-defined module
	CDCREFO	External routine
CDCWF	OUTFIL	External routine
	ERRPRO	External routine
	OPNFIL	External routine
	INPFIL	External routine
	CLSFIL	External routine
CDGENRT	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDPIC	Well-defined module
	CDCREFO	External routine
	RETFLDS	Well-defined module
	CDIMD	Well-defined module
CDGNV	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDPIC	Well-defined module
	CDCREFO	External routine

DOCGROUP PS41260 Main Program Parts List

Main Pgm Name -----	Module Name -----	Module Type -----
CDGTV	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDPIC	Well-defined module
	CDCREFO	External routine
CDIC	CDMACR	Well-defined module
	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
CDIMD	ERRPRO	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLTFL	External routine
	SQLOPN	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
CDMACR	OUTFIL	External routine
	ERRPRO	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine

DOCGROUP PS41260 Main Program Parts List

Main Pgm Name -----	Module Name -----	Module Type -----
	SQLSCC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLTOC	External routine
	SQLCLS	External routine
CDMSG	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDPIC	Well-defined module
	CDCREFO	External routine
CDMSG2	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDCREFO	External routine
CDPIC		
CDPIC8		
CDPOOL		
	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
CDPRM		
	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDPIC	External routine

DOCGROUP PS41260 Main Program Parts List

Main Pgm Name -----	Module Name -----	Module Type -----
CDQDF	CDCREFO	External routine
	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDPIC	External routine
CDQPOP CDRDF	CDCREFO	External routine
	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDPIC	External routine
CDRFT	CDCREFO	External routine
	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDPIC	External routine
CDRPCIF	CDCREFO	External routine
	CDGETOF	External routine
	OUTFIL	External routine
	ERRPRO	External routine
	CDQPOP	External routine
CDRPIIF	OUTFIL	External routine
	ERRPRO	External routine
	CDQPOP	External routine
CDRPUIF	OUTFIL	External routine

DOCGROUP PS41260 Main Program Parts List

Main Pgm Name -----	Module Name -----	Module Type -----
RETFLDS	ERRPRO	External routine
	CDQPOP	External routine
	ERRPRO	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLXEX	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLTOC	External routine
	SQLCLS	External routine

3.10.4 Module Documentation

The following documentation describes information which is specific to each individual module in the documentation group being documented in this specification. It provides a compact way of getting information that would be otherwise buried within each module's source code.

The specific items in this module documentation have the following meanings:

NAME:	Name of program Module.
PURPOSE:	Purpose of Module as detailed in the source code.
LANGUAGE:	Programming language source code is written in. The choices are: VAX-11 FORTRAN C (I/S-1 Workbench 'C') VAX-11 COBOL
MODULE TYPE:	Whether a Program, Subroutine, or Function.
SOURCE FILE:	Name of Source File from file specification.
SOURCE FILE TYPE:	Source File Extension from file specification.
HOST:	Whether this is a host-dependent routine (VAX or IBM) or blank if host-independent.
SUBSYSTEM:	IISS sub-system this file resides in.
SUBDIRECTORY:	Sub-directory of that subsystem in which this file resides.
DOCUMENTATION GROUP:	Name of documentation group of which this source file is a member.
DESCRIPTION:	A description of the module as obtained from the source code.
ARGUMENTS:	The arguments with which this routine is called if it is a Subroutine or a Function.
INCLUDE FILES:	A list of all the files that are included into this module as well as their purposes.
ROUTINES CALLED:	Subroutines or Functions, either documented or external, called by this module, if any.

CALLED DIRECTLY BY: The documented routines which call
this module, if any.

USED IN MAIN PROGRAM(S): The documented Main Programs which
contain this module in their parts
list according to the list in section
3.10.3.

The Module Documentation is arranged alphabetically according
to Module Name.

DOCGROUP PS41260 Module Documentation

NAME: CDCI
PURPOSE: GENERATE PROCEDURE DIVISION CODE FOR CS TO IS
TRANSFORM
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDCI
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

-

THIS ROUTINE WILL GENERATE ANSI X3.23-1974 COBOL CDCI TRANSFORMS IS-ACTION ENTRIES FOR INSERTS AND MODIFYS. IT ALSO TRANSFORMS TYPE 2 IS-QUALIFY ENTRIES FOR SELECTS, TYPE 1 AND 2 REFERENTIAL INTEGRITY TESTS, KEY UNIQUENESS TESTS, MODIFYS AND DELETES. IN ADDITION, CDCI SETS UP NATIVE DATA BASE OR USER DEFINED NULL VALUE POPULATION OF UNMAPPED DATA FIELDS FOR INSERTS. CDCI ALSO TRANSFORMS UNION VALUES.

ARGUMENTS:

FCB-W	DSPLY[S9(9)]
FCB2-W	DSPLY[S9(9)]
MY-HOST	DSPLY[X(3)]
SUBTRANS-ID	DSPLY[999]
IS-ACTION-LIST	RECRD
IS-QUALIFY-LIST	RECRD
CS-ACTION-LIST	RECRD
CS-QUALIFY-LIST	RECRD
COMPLEX-MAPPING-ALG-TABLE	RECRD
NUMERIC-NULL	DSPLY[X(30)]
CHAR-NULL	DSPLY[X(30)]
SOURCE-LANGUAGE	DSPLY[X(10)]
FORTTRAN-VARIABLE-TABLE	RECRD
STRING-EXPANSION-FLAG	DSPLY[X]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
MACDAT
SBSTLST
ISAL
ISQUAL
CSAL
CSQUAL
CMAT
FORVAR
ERRPRO

ROUTINES CALLED:

CDMACR
CDGETOF
OUTFIL
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDCMPRM
PURPOSE: GENERATE WS DATA DEFINITIONS FOR CMA PARAMETERS
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDCMPRM
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS ROUTINE WILL GENERATE THE WORKING STORAGE
DATA DEFINITIONS REQUIRED FOR THE RUN TIME
COMPLEX MAPPING ALGORITHM PARAMETERS.

MODIFIED 9/88 - RELEASE 2.5
GENERATE CODE IN COBOL, C, OR FORTRAN.
-

ARGUMENTS:

COMPLEX-MAPPING-ALG-TABLE RECRD
SUBTRANS-ID DSPLY[999]
FCB-W DSPLY[S9(9)]
SOURCE-LANGUAGE DSPLY[X(10)]
FORTRAN-VARIABLE-TABLE RECRD
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

CHKCDM
ERRCDM
ERRFS
CMAT
FORVAR
ERRPRO

ROUTINES CALLED:

CDPIC
CDCREFO
CDGETOF
OUTFIL
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDGENRT
PURPOSE: GENERATE A RECORD STRUCTURE
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDGENRT
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS FUNCTION WILL GENERATE A COBOL WORKING
STORAGE RECORD LAYOUT FOR A SPECIFIED RECORD
TYPE.

MODIFIED 9/88 - RELEASE 2.5
GENERATE IN COBOL, C, OR FORTRAN.
-

ARGUMENTS:

DB-ID DSPLY[S9(6)]
RT-ID DSPLY[X(30)]
FCB-W DSPLY[S9(9)]
SOURCE-LANGUAGE DSPLY[X(10)]
FORTRAN-VARIABLE-TABLE RECRD
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

CHKCDM
ERRCDM
ERRFS
TDFTBL
FORVAR
ERRPRO

ROUTINES CALLED:

RETFlds
CDIMD
CDPIC
OUTFIL
CDCREFO
CDGETOF
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDGNV
PURPOSE: GENERATE USER-DEFINED NULL PIC CLAUSES
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDGNV
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS ROUTINE WILL GENERATE USER-DEFINED NULL
VARIABLE NAMES AND PICTURE CLAUSES INTO THE
SQL REQUEST PROCESSOR WORKING STORAGE SECTION.
THE VARIABLES GENERATED BY THIS PROGRAM WILL
PARTICIPATE IN THE SQL WHERE CLAUSE.--5/16/86

MODIFIED 9/88 ~ RELEASE 2.5
GENERATE CODE IN COBOL, C, AND FORTRAN.
-

ARGUMENTS:

IS-QUALIFY-LIST RECRD
IS-ACTION-LIST RECRD
COMPLEX-MAPPING-ALG-TABLE RECRD
SUBTRANS-ID DSPLY[999]
NUMERIC-NULL DSPLY[X(30)]
CHAR-NULL DSPLY[X(30)]
FCB-W DSPLY[S9(9)]
SOURCE-LANGUAGE DSPLY[X(10)]
FORTRAN-VARIABLE-TABLE RECRD
STRING-EXPANSION-FLAG DSPLY[X]
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

ERRFS
ERRCDM
CHKCDM
ISQUAL
ISAL
CMAT
FORVAR
ERRPRO

ROUTINES CALLED:

CDPIC
CDCREFO
CDGETOF
OUTFIL
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDGTV
PURPOSE: GENERATE WS TAG VARIABLE AND INDICATOR DEFINITIONS
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDGTV
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS ROUTINE WILL GENERATE WORKING STORAGE
AND INDICATOR DEFINITIONS IN SUPPORT OF
CONCEPTUAL EVALUATION IN THE PRESENCE OF
COMPLEX INTERNAL TO CONCEPTUAL MAPPING FOR
DELETES AND MODIFYS.

MODIFIED 9/88 - RELEASE 2.5
GENERATE CODE IN COBOL, C, OR FORTRAN.
-

ARGUMENTS:

COMPLEX-MAPPING-ALG-TABLE RECRD
IS-QUALIFY-LIST RECRD
CS-QUALIFY-LIST RECRD
FCB-W DSPLY[S9(9)]
SUBTRANS-ID DSPLY[999]
SOURCE-LANGUAGE DSPLY[X(10)]
FORTRAN-VARIABLE-TABLE RECRD
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

CHKCDM
ERRCDM
ERRFS
ISQUAL
CMAT
CSQUAL
FORVAR
ERRPRO

ROUTINES CALLED:

CDPIC
CDCREFO
CDGETOF
OUTFIL
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDIC
PURPOSE: GENERATE CODE TO PERFORM IS TO CS TRANSFORMATIONS
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDIC
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

-

TRANSFORM ALL IS-ACTION ENTRIES FOR THE CURRENT
SUBTRANSACTION. IF DELETE OR MODIFY, TRANSFORM
QUALIFICATIONS IF NOT ALL INTERNALLY EVALUATABLE.

ARGUMENTS:

FCB-W DSPLY[S9(9)]
FCB2-W DSPLY[S9(9)]
MY-HOST DSPLY[X(3)]
SUBTRANS-ID DSPLY[999]
IS-ACTION-LIST RECRD
COMPLEX-MAPPING-ALG-TABLE RECRD
NUMERIC-NULL DSPLY[X(30)]
CHAR-NULL DSPLY[X(30)]
CS-QUALIFY-LIST RECRD
IS-QUALIFY-LIST RECRD
RFT RECRD
SOURCE-LANGUAGE DSPLY[X(10)]
FORTRAN-VARIABLE-TABLE RECRD
STRING-EXPANSION-FLAG DSPLY[X]
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
MACDAT
SBSTLST
ISAL
CMAT
CSQUAL
ISQUAL
RFTABLE
FORVAR
ERRPRO

ROUTINES CALLED:

ERRPRO
OUTFIL
CDMACR
CDGETOF

DOCGROUP PS41260 Module Documentation

NAME: CDIMD
PURPOSE: RETRIEVES INTERNAL SCHEMA METADATA
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDIMD
SOURCE FILE TYPE: PCO
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS ROUTINE WILL USE AN INTERNAL DATA FIELD NAME,
DATA BASE ID AND RECORD ID AND ACCESS THE CDM FOR
FOR ITS INTERNAL TYPE, SIZE AND NUMBER OF DECIMAL
DIGITS.

ROUTINE WAS MODIFIED TO USE EMBEDDED SQL -- 5/13/86
SELECT DATA TYPE, SIZE AND NUMBER OF DECIMAL DIGITS
FOR A PARTICULAR DATA TYPE NAME. IF NOT FOUND,
GENERATE AN ERROR MESSAGE.

ARGUMENTS:

DAT-TYP-NM DSPLY[X(30)]
IS-TYPE DSPLY[X]
IS-SIZE DSPLY[999]
IS-ND DSPLY[99]
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
CHKCDM
EOD
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTFL
SQLOPN
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
ERRPRO

DESCRIPTION:

ARGUMENTS :

INCLUDE FILES:

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLCLS
SQLAD1
SQLFCH
OUTFIL
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDMSG
PURPOSE: GENERATE WS CS DATA DEFINITIONS FOR RUNTIME
PARAMETERS
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDMSG
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS ROUTINE WILL GENERATE THE WORKING STORAGE
CONCEPTUAL DATA DEFINITIONS REQUIRED FOR THE
RUNTIME SEARCH PARAMETERS.

MODIFIED 9/88 - RELEASE 2.5
GENERATE CODE IN COBOL, C, OR FORTRAN.
-

ARGUMENTS:

FCB-W DSPLY[S9(9)]
SUBTRANS-ID DSPLY[9(3)]
CS-QUALIFY-LIST RECRD
IS-QUALIFY-LIST RECRD
IS-ACTION-LIST RECRD
CS-ACTION-LIST RECRD
SOURCE-LANGUAGE DSPLY[X(10)]
FORTRAN-VARIABLE-TABLE RECRD
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

ERRFS
ERRCDM
CSQUAL
ISQUAL
ISAL
CSAL
FORVAR
ERRPRO

ROUTINES CALLED:

CDPIC
CDCREFO
CDGETOF
OUTFIL
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDPIC
PURPOSE: GENERATE A PICTURE CLAUSE DATA DEFINITION FOR COBOL
 IDENTIFIER
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDPIC
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: SHAKE

DESCRIPTION:

THIS SUBROUTINE WILL GENERATE A PICTURE CLAUSE
DATA DEFINITION FOR A COBOL IDENTIFIER ACCORDING
TO IT'S TYPE, SIZE (AND DECIMAL POINT).
FOR EXAMPLE :
9(010).
X(20).
S9(010)V(02).
9(008)V(02).

THE INPUT PARAMETERS OF THIS SUBROUTINES ARE
1. IDENTIFIER TYPE
2. IDENTIFIER SIZE(LENGTH)
3. IDENTIFIER LENGHT OF DECIMAL POINT
(IF IDENTIFIER IS PIC 9 TYPE).
THE OUTPUT OF THIS SUBROUTINE IS IN PIC-CLAUSE
VARIABLE

ARGUMENTS:

ID-TYPE DSPLY[X]
ID-SIZE DSPLY[999]
NO-DEC DSPLY[99]
PIC-CLAUSE DSPLY[X(30)]

DOCGROUP PS41260 Module Documentation

NAME: CDPIC8
PURPOSE: GENERATE A PICTURE CLAUSE DATA DEFINITION FOR COBOL
IDENTIFIER
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDPIC8
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: SHARE

DESCRIPTION:

THIS SUBROUTINE WILL GENERATE A PICTURE CLAUSE
DATA DEFINITION FOR A COBOL IDENTIFIER ACCORDING
TO IT'S TYPE, SIZE (AND DECIMAL POINT).

FOR EXAMPLE :

9(010).
X(20).
S9(010)V(02).
9(008)V(02).

THE INPUT PARAMETERS OF THIS SUBROUTINES ARE

1. IDENTIFIER TYPE
2. IDENTIFIER SIZE (LENGTH)
3. IDENTIFIER LENGTH OF DECIMAL POINT
(IF IDENTIFIER IS PIC 9 TYPE).

THE OUTPUT OF THIS SUBROUTINE IS IN PIC-CLAUSE
VARIABLE

ARGUMENTS:

ID-TYPE	DSPLY[X]
ID-SIZE	DSPLY[999]
NO-DEC	DSPLY[99]
PIC-CLAUSE	DSPLY[X(30)]

DOCGROUP PS41260 Module Documentation

```
NAME: CDPOOL
PURPOSE: GENERATE FORTRAN PARAMETER INITIALIZATION FROM
        MESSAGE POOL
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDPOOL
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML
```

DESCRIPTION:

- THIS ROUTINE WILL GENERATE THE FORTRAN PARAMETER
VARIABLE INITIALIZATION BY EXTRACTING THE APPROPRIATE
STRING FROM THE MSGIN POOL.

ARGUMENTS:

FCB-W	DSPLY[S9(9)]
SUBTRANS-ID	DSPLY[999]
CS-QUALIFY-LIST	RECRD
CS-ACTION-LIST	RECRD
IS-QUALIFY-LIST	RECRD
IS-ACTION-LIST	RECRD
FORTAN-VARIABLE-TABLE	RECRD
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRFS
ERRCDM
CSQUAL
CSAL
ISQUAL
ISAL
FORVAR
ERRPRO

ROUTINES CALLED:

CDGETOF
OUTFIL
ERRPRO

DESCRIPTION:

THE ROUTINE WAS UPDATED ON MAY 8, 1986 IN ORDER
TO HANDLE THE COMPLEX MAPPING ALGORITHM TABLE
ENTRIES.
UPDATED 9/88 TO GENERATE CODE IN COBOL, C, OR
FORTRAN.

ARGUMENTS:

INCLUDE FILES:

ROUTINES CALLED:

3-35

DOCGROUP PS41260 Module Documentation

NAME: CDRFT
PURPOSE: GENERATE CS DATA DEFINITION FOR RETRIEVED DF'S
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDRFT
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- ?

THIS SUBROUTINE LOOP THROUGH THE RFT TABLE TO
GENERATE THE COBOL IDENTIFIER FOR EACH ENTRY
IN THE TABLE, FOR EXAMPLE :

01 RESULT-REC.
03 RES-001 PIC X(20).
03 RES-002 PIC 9(4).

THIS SUBROUTINE WAS UPDATED MAY 8, 1986 INORDER TO
HANDLE 03 LEVEL DATA DEFINITIONS FOR THE NULL
FLAG INDICATORS INCLUDED FOR RELEASE 2.3.
UPDATED 9/88 TO GENERATE CODE IN C, COBOL, OR FORTRAN.

ARGUMENTS:

FCB-W
SUBTRANS-ID
RFT
REC-LENGTH
SOURCE-LANGUAGE
FORTRAN-VARIABLE-TABLE
RET-STATUS

INCLUDE FILES:

ERRFS
ERRCDM
RFTABLE
FORVAR
ERRPRO

ROUTINES CALLED:

CDPIC
CDCREFO
CDGETOF
OUTFIL
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDRPCIF
PURPOSE: GENERATE A COBOL IF STMT FOR USER QUALIFICATIONS EVAL
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDRPCIF
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS ROUTINE WILL GENERATE A COBOL IF STATEMENT THAT WILL EVALUATE USER QUALIFICATIONS CONTAINED IN A NDML WHERE CLAUSE. THE IF STATEMENT WILL BE GENERATED INTO A REQUEST PROCESSOR SUB PROGRAM TO PERFORM THE EVALUATION OF THE WHERE CLAUSE AT THE CONCEPTUAL SCHEMA LEVEL. THIS IF STATEMENT WILL BE NECESSARY FOR ANY UPDATE TRANSACTIONS THAT CONTAINED COMPLEX MAPPING ALGORITHMS IN THE WHERE CLAUSE.

UPDATED 9/88 TO GENERATE CODE IN C, COBOL, OR
FORTRAN.

ARGUMENTS:

BOOLEAN-LIST	RECRD
CS-QUALIFY-LIST	RECRD
CS-ACTION-LIST	RECRD
IS-QUALIFY-LIST	RECRD
SUBTRANS-ID	DSPLY[9 (3)]
FCB-W	DSPLY[S9 (9)]
SOURCE-LANGUAGE	DSPLY[X (10)]
FORTTRAN-VARIABLE-TABLE	RECRD
RET-STATUS	DSPLY[X (5)]

INCLUDE FILES:

```
CHKCDM
ERRCDM
ERRFS
BOOLST
CSQUAL
CSAL
ISQUAL
FORVAR
ERRPRO
```

ROUTINES CALLED:

CDQPOP
CDGETOF
OUTFIL
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDRPIIF
PURPOSE: GENERATE A COBOL IF STMT FOR USER QUALIFICATIONS EVAL
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDRPIIF
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS ROUTINE WILL GENERATE A COBOL IF STATEMENT
THAT WILL EVALUATE USER QUALIFICATIONS CONTAINED
IN A NDML WHERE CLAUSE. THE IF STATEMENT WILL BE
GENERATED INTO A REQUEST PROCESSOR SUB PROGRAM
TO PERFORM THE EVALUATION OF THE WHERE CLAUSE
AT THE INTERNAL SCHEMA LEVEL. THIS IF STATEMENT
WILL BE NECESSARY FOR ANY UPDATE TRANSACTIONS THAT
CONTAIN QUALIFICATION.
-

ARGUMENTS:

SUBTRANS-BOOLEAN-LIST RECRD
IS-QUALIFY-LIST RECRD
FCB-W DSPLY[S9(9)]
SUBTRANS-ID DSPLY[9(3)]
CHARACTER-NULL DSPLY[X(30)]
NUMERIC-NULL DSPLY[X(30)]
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

CHKCDM
ERRCDM
ERRFS
SUBBOOL
ISQUAL
ERRPRO

ROUTINES CALLED:

CDQPOP
OUTFIL
ERRPRO

DOCGROUP PS41260 Module Documentation

NAME: CDRPUIF
PURPOSE: GENERATE A COBOL IF STMT FOR USER QUALIFICATIONS EVAL
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDRPUIF
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS ROUTINE WILL GENERATE A COBOL IF STATEMENT
THAT WILL EVALUATE RECORD UNION DISCRIMINATOR
QUALIFICATION FOR A SPECIFIED RECORD TYPE. THE
IF STATEMENT WILL BE GENERATED INTO A REQUEST
PROCESSOR SUB PROGRAM TO PERFORM THE EVALUATION
AT THE INTERNAL SCHEMA LEVEL.
-

ARGUMENTS:

SUBTRANS-BOOLEAN-LIST RECRD
IS-QUALIFY-LIST RECRD
RECORD-TYPE-NUMBER DSPLY[9(6)]
FCB-W DSPLY[S9(9)]
SUBTRANS-ID DSPLY[9(3)]
CHARACTER-NULL DSPLY[X(30)]
NUMERIC-NULL DSPLY[X(30)]
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

CHKCDM
ERRCDM
ERRFS
SUBBOOL
ISQUAL
ERRPRO

ROUTINES CALLED:

OUTFIL
CDQPOP
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLCLS
SQLAD1
SQLFCH
ERRPRO

3.10.5 Include File Descriptions

The following list contains a purpose and description of each include file in the documentation group as specified in the source code. The language it is written in is also given.

DOCGROUP PS41260 Include File Description

FILE NAME: BOOLST
PURPOSE: BOOLEAN LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS THE BOOLEAN OPERATORS, PARENTHESES, AND
POINTERS TO THE TYPE 2 CONDITIONS FOR AN NDML
TRANSACTION

DOCGROUP PS41260 Include File Description

FILE NAME: CHKCDM
PURPOSE: IISS CDM CHECK STATUS CODES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS ALL STATUS CODES FOR THE *
CDMP MODULES *

DOCGROUP PS41260 Include File Description

FILE NAME: CMAT
PURPOSE: COMPLEX MAPPING ALGORITHM TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

THIS TABLE IDENTIFIES THE SOFTWARE MODULES AND
PARAMETERS THAT ARE NEEDED TO PERFORM COMPLEX
MAPPINGS BETWEEN CS AND IS FORMATS

DOCGROUP PS41260 Include File Description

FILE NAME: COBOLOP
PURPOSE: WORKING STORAGE VARIABLES OPERATOR TRANSLATION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DOCGROUP PS41260 Include File Description

FILE NAME: CSAL
PURPOSE: CONCEPTUAL SCHEMA ACTION LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

TABLE TO HOLD CONCEPTUAL DATA ABOUT THE REQUEST

NOTE!!!!!! This table is cloned in both cdp5 and cdp4
so any changes made to this structure needs to
be made in these cloned versions. Clone version
is CSALX for CDP4.

NOTE AGAIN Any changes to the CS-ACTION-ENTRY must be
reflected in CDP10B in the C code generation section. The
length of CS-STRING2 has been hard coded in the
generated C code in paragraph
210-GEN-MOVE-OF-TABLES.

***** THE CONCEPTUAL SCHEMA ACTION LIST

DOCGROUP PS41260 Include File Description

FILE NAME: CSQUAL
PURPOSE: CONCEPTUAL SCHEMA QUALIFY LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS CONCEPTUAL SCHEMA INFORMATION FOR
THE REQUEST'S QUALIFICATION

NOTE!!!!!!
This table is cloned as CSQUALX in CDP4. If it
is changed, CSQUALX must be changed also.

THE CONCEPTUAL SCHEMA QUALIFY LIST

DOCGROUP PS41260 Include File Description

FILE NAME: EOD
PURPOSE: SQL END OF DATA DEFINITION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DOCGROUP PS41260 Include File Description

FILE NAME: ERRCDM
PURPOSE: IISS ERROR STATUS CODES FOR CDMF MODULES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS ALL ERROR CODES USED BY CDMF *
MODULES FOR ERROR HANDLING *

DOCGROUP PS41260 Include File Description

FILE NAME: ERRFS
PURPOSE: ERRFS.INC - FILE I/O PRIMITIVES (FILE SERVICES)
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

IISS ERROR CODES

THIS FILE DEFINES THE FS STATUS
CODES IN COBOL FORMAT

DOCGROUP PS41260 Include File Description

FILE NAME: ERRORST
PURPOSE: WS DEFINITION FOR ERROR STATUS
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

ERROR STATUS VARIABLE

DOCGROUP PS41260 Include File Description

FILE NAME: ERRPRO
PURPOSE: PROCESS ERROR INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DOCGROUP PS41260 Include File Description

FILE NAME: FORVAR
PURPOSE: FORTRAN VARIABLE TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

THIS TABLE HOLDS THE ORIGINAL FORTRAN VARIABLE
AND ITS GENERATED SIX-CHARACTER COUNTERPART.

DOCGROUP PS41260 Include File Description

FILE NAME: ISAL
PURPOSE: INTERNAL SCHEMA ACTION LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS INTERNAL SCHEMA INFORMATION ABOUT AN
NDML REQUEST

DOCGROUP PS41260 Include File Description

FILE NAME: ISQUAL
PURPOSE: INTERNAL SCHEMA QUALIFY LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS INTERNAL SCHEMA INFORMATION FOR AN
NDML QUALIFICATION

THE INTERNAL SCHEMA QUALIFY LIST

DOCGROUP PS41260 Include File Description

FILE NAME: MACDAT
PURPOSE: WS VARIABLES FOR MACRO COPY UTILITY
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DOCGROUP PS41260 Include File Description

FILE NAME: RFTABLE
PURPOSE: THE RESULT FIELD TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS CONCEPTUAL SCHEMA INFORMATION ABOUT
THE RESULTS OF AN NDML REQUEST

THE RESULT FIELD TABLE

WHEN CHANGING THE STRUCTURE OF THIS TABLE

DOCGROUP PS41260 Include File Description

FILE NAME: SBSTLST
PURPOSE: WS DEFINITION FOR THE SUBSTITUTION LIST TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

SUBSTITUTION-LIST REPRESENTS THE INPUT TABLE
OF SUBSTITUTION PARAMETERS FOR THE CDMACR
MACRO EXPANSION SUBROUTINE

DOCGROUP PS41260 Include File Description

FILE NAME: SUBBOOL
PURPOSE: SUBTRANS BOOLEAN LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS ALL THE BOOLEAN OPERATORS, PARENTHESES, AND
CONDITIONS WHICH CAN BE SATISFIED AT THE INTERNAL
SCHEMA LEVEL, FOR EACH SUBTRANSACTION.

DOCGROUP PS41260 Include File Description

FILE NAME: TDFTBL
PURPOSE: TABLE TO HOLD TEMPORARY RECORD DEFINITION VARIABLES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

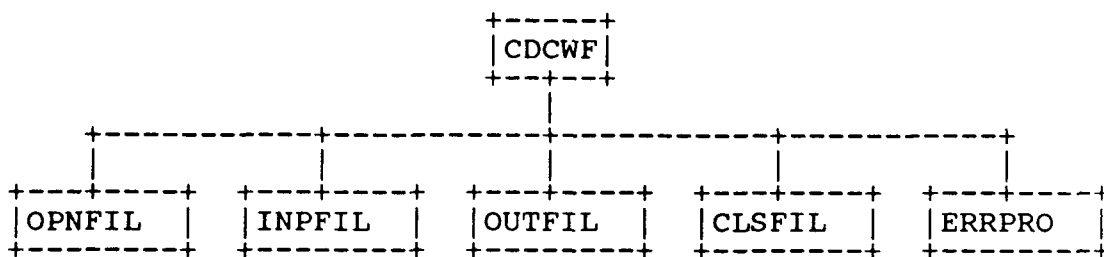
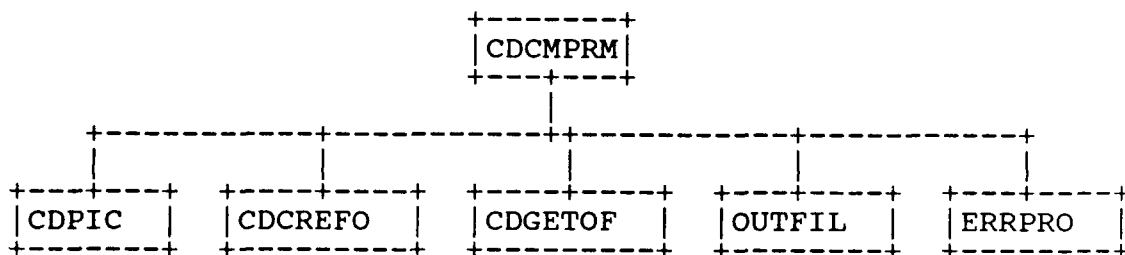
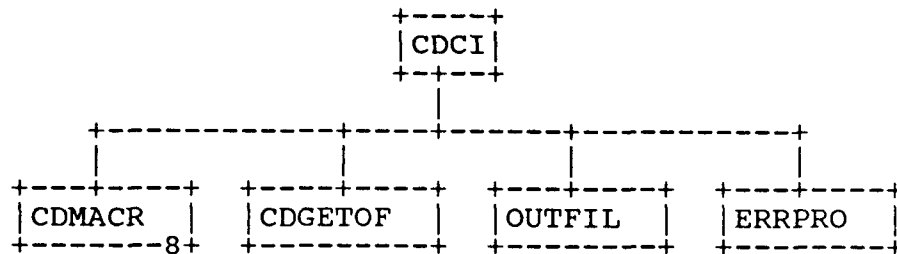
DESCRIPTION :

TABLE TO HOLD INFORMATION NEEDED TO DEFINE A RECORD

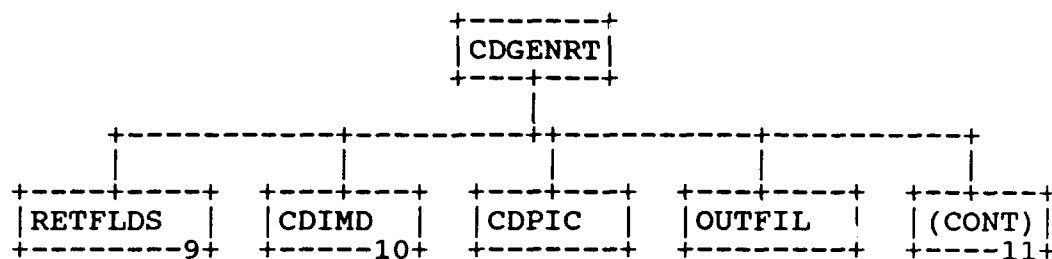
3.10.6 Hierarchy Chart

1

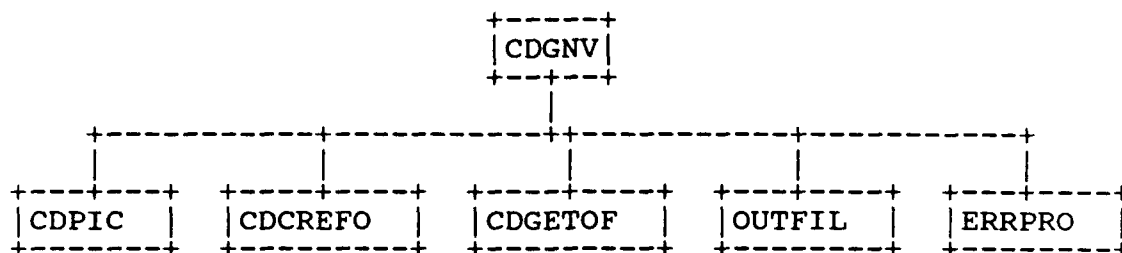
CDCI	CDCMPRM	CDCWF	CDGENRT	CDGNV	(CONT)
-2-	-3-	-4-	-5-	-6-	-7-



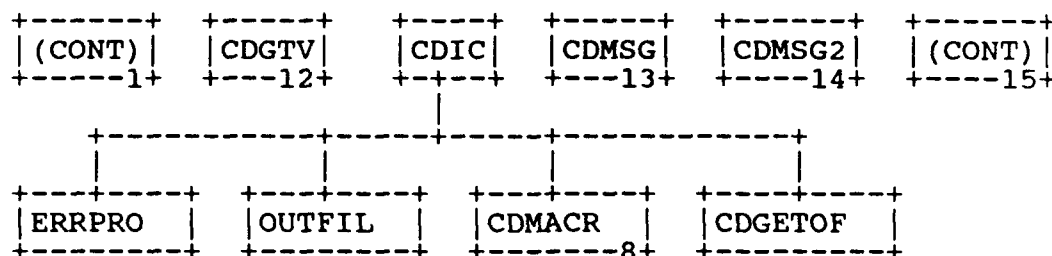
5



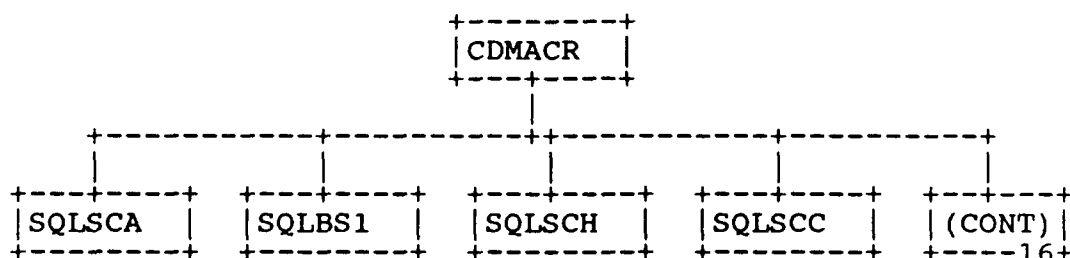
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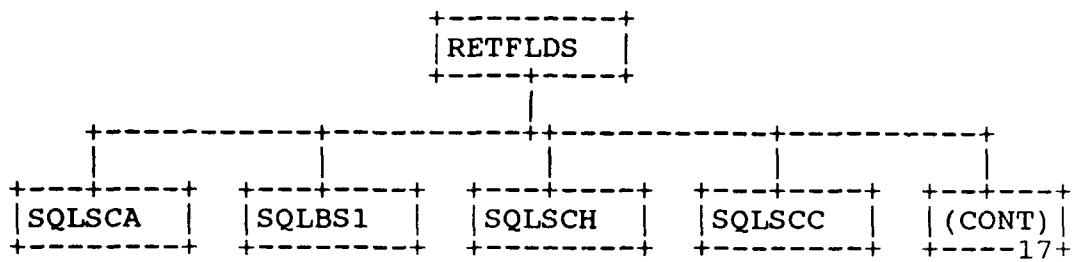
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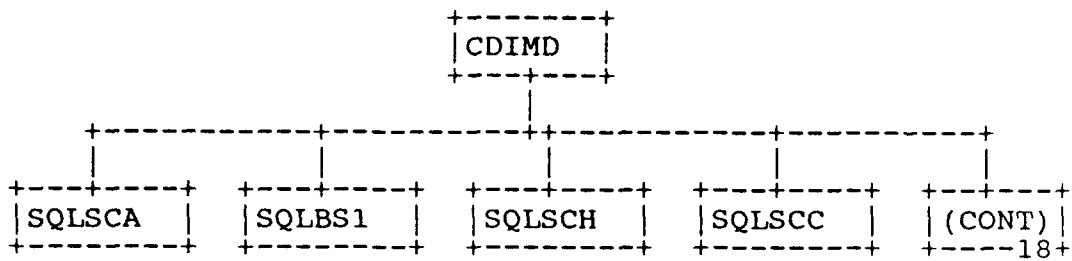
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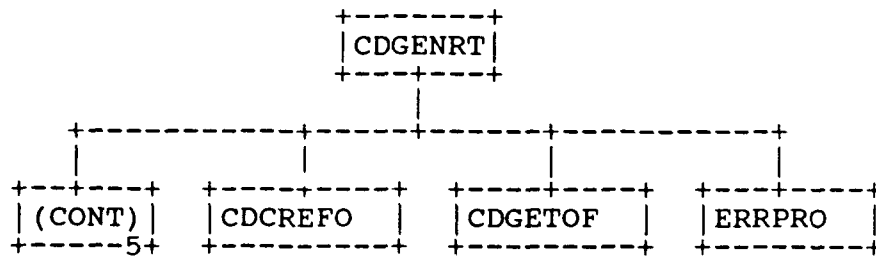
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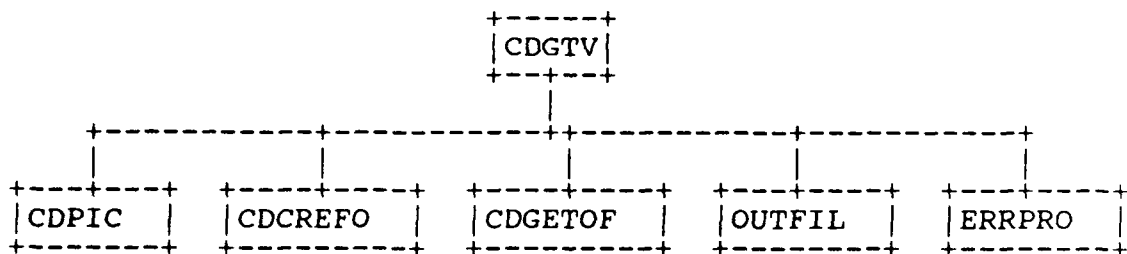
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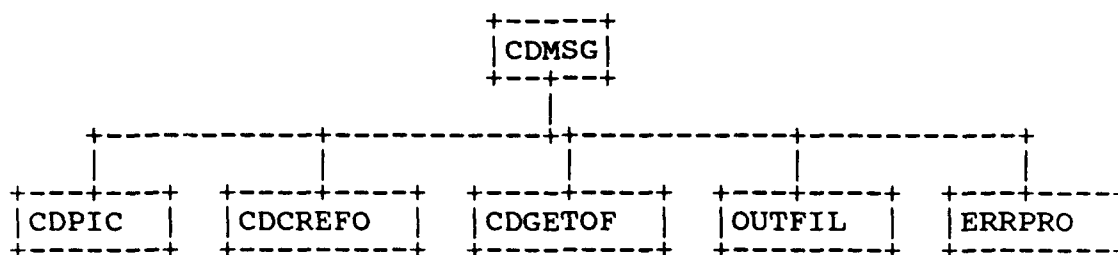
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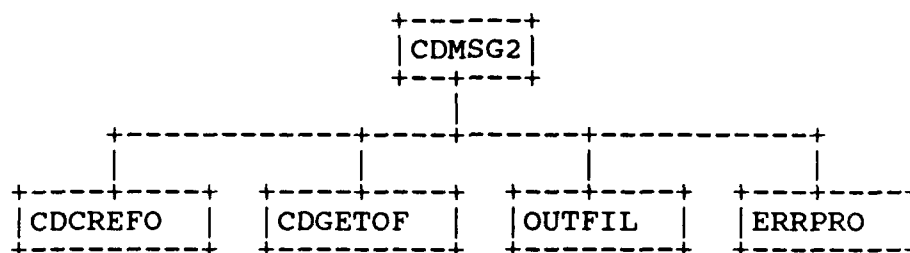
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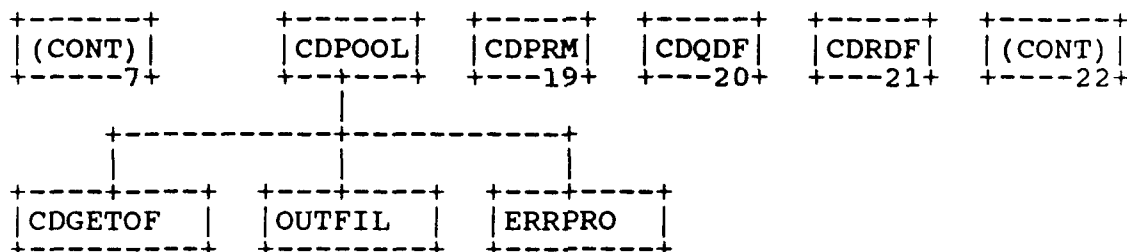
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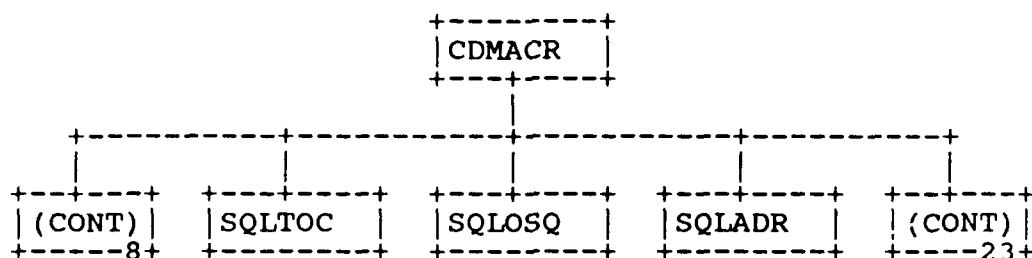
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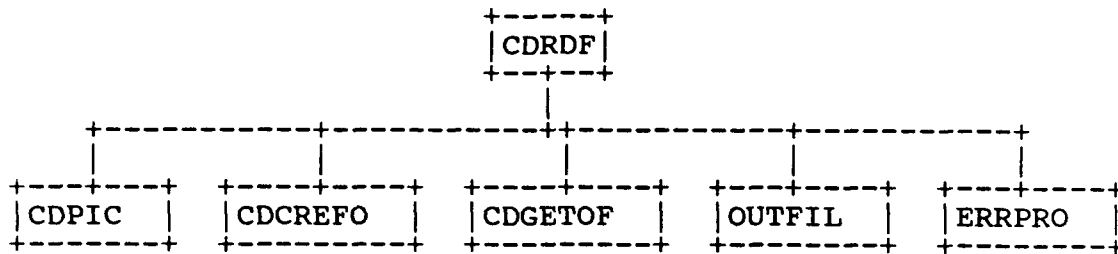


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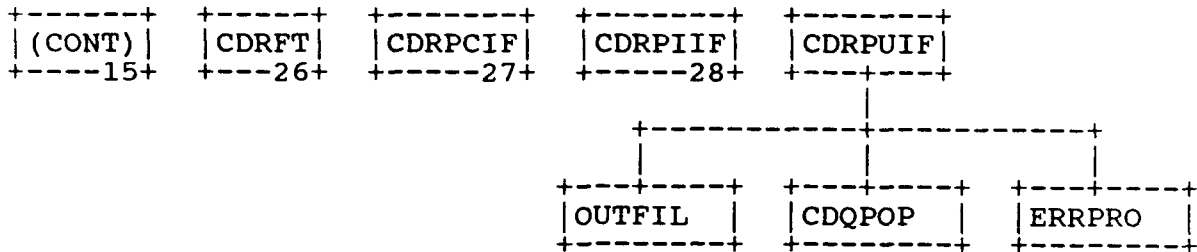




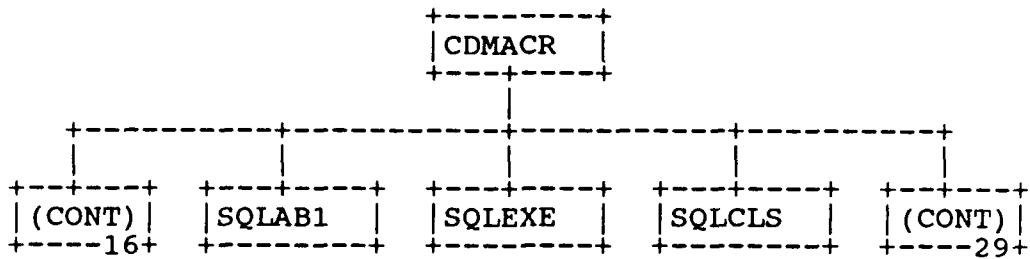
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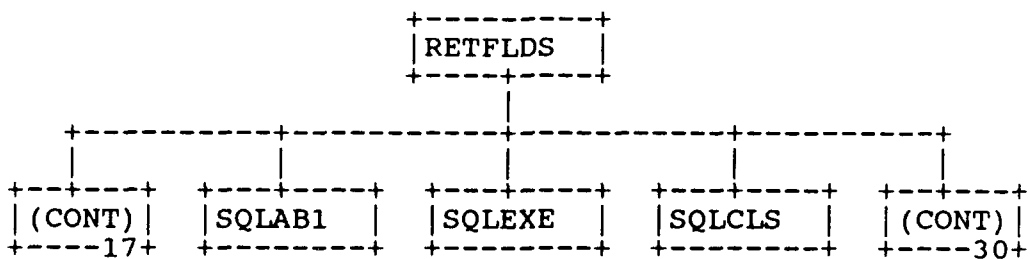
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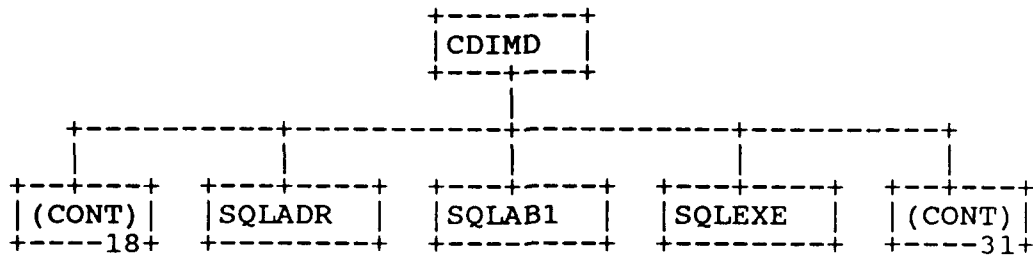
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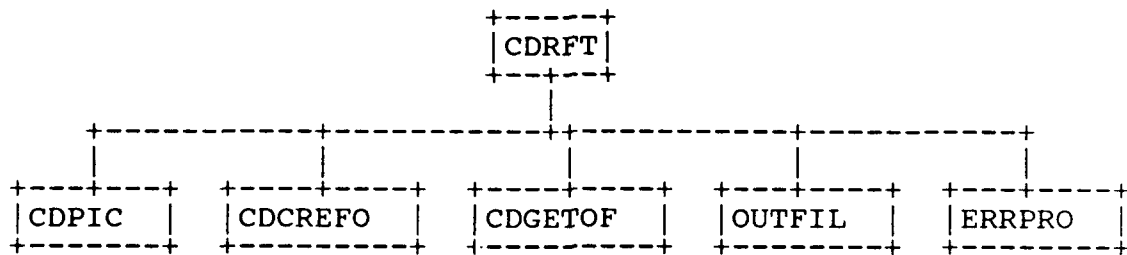
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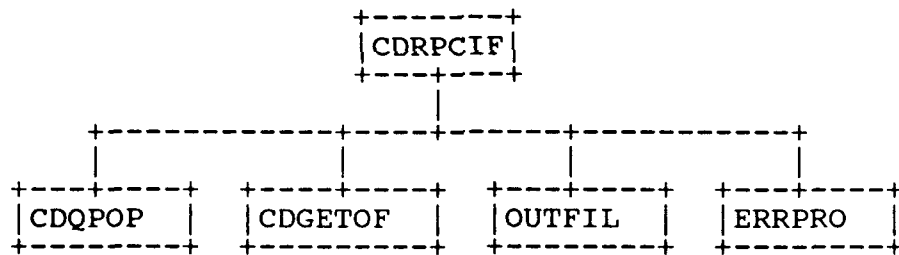
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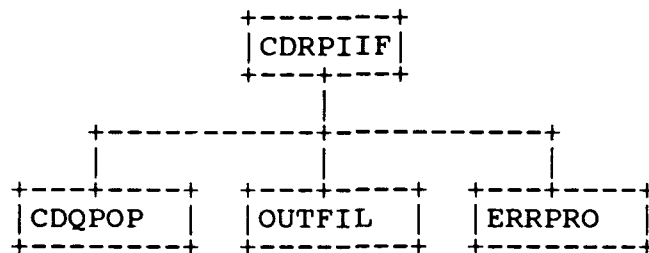
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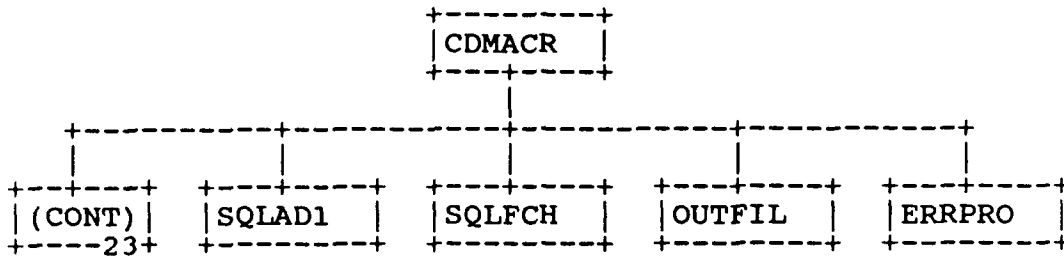
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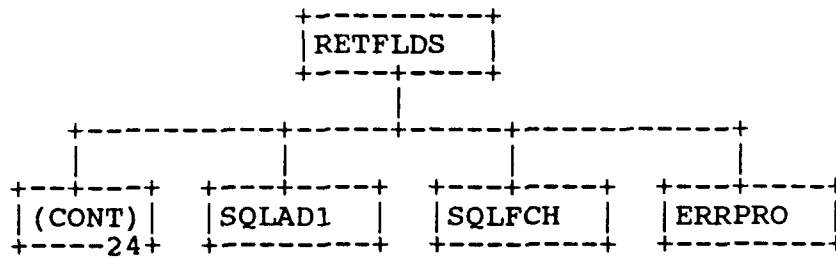
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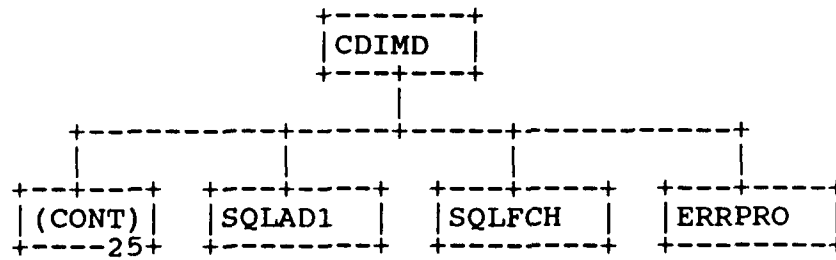
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30



31



CDCI.....	2
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CDCREFO	
CDCWF.....	4
CDGENRT.....	5
CDGETOF	
CDGNV.....	6
CDGTV.....	12
CDIC.....	7
CDIMD	10
CDMACR	8
CDMSG.....	13
CDMSG2.....	14
CDPIC	
CDPOOL.....	15
CDPRM.....	19
CDQDF.....	20
CDQPOP	
CDRDF.....	21
CDRFT.....	26
CDRPCIF.....	27
CDRPIIF.....	28
CDRPUIF.....	22
CLSFIL	
ERRPRO	
INPFIL	
OPNFIL	
OUTFIL	
RETFLDS	9
SQLAB1	
SQLAD1	
SQLADR	
SQLBS1	
SQLCLS	
QLEXE	
SQLFCH	
SQLOPN	
SQLOSQ	
SQLSCA	
SQLSCC	
SQLSCH	
SQLTFL	
SQLTOC	

3.11 Program Listings Comments

This information is contained in the Module Descriptions in section 3.10.

SECTION 4

QUALITY ASSURANCE PROVISIONS

4.1 Introduction and Definitions

"Testing" is a systematic process that may be preplanned and explicitly stated. Test techniques and procedures may be defined in advance, and a sequence of test steps may be specified. "Debugging" is the process of isolation and correction of the cause of an error.

"Antibugging" is defined as the philosophy of writing programs in such a way as to make bugs less likely to occur and when they do occur, to make them more noticeable to the programmer and the user. In other words, as much error checking as is practical and possible in each routine should be performed.

4.2 Computer Programming Test and Evaluation

The quality assurance provisions for test consists of the normal testing techniques that are accomplished during the construction process. They consist of design and code walk-throughs, unit testing, and integration testing. These tests are performed by the design team. Structured design, design walk-through and the incorporation of "antibugging" facilitate this testing by exposing and addressing problem areas before they become coded "bugs."