CA-Pan®/SQL

Getting Started

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Chapter

1 Introduction

This *SQL Interface Installation Guide* describes how to install the Computer Associates SQL interface, CA-Pan/SQL, an optional component to several Computer Associates products. CA-Pan/SQL currently supports the following SQL database management systems:

- DB2 for OS/390 and z/OS
- DB2 Server for VM and VSE
- Oracle
- CA-Datacom/DB
- CA-IDMS

Throughout this guide, *you* refers to the person who installs CA-Pan/SQL. *User* refers to a person using any of the products that use CA-Pan/SQL. *Host product* refers to a product using the SQL interface (CA-Pan/SQL).

This guide assumes that you are familiar with the SQL syntax and operation of the underlying database management system for which you are installing the CA-Pan/SQL interface product.

This guide contains a separate chapter for each environment (CMS, OS/390 and z/OS, and VSE). Each chapter also contains information about the SQL database management system used to install CA-Pan/SQL in the particular environment. Therefore, after reading this chapter, you need to read only the chapter that is appropriate for your environment and database.

Installation Considerations

CA-Pan/SQL is installed once for a given environment and database, and then shared among the various products that use it. If the current release of CA-Pan/SQL is already installed at your site, do not reinstall it; however, be sure that you have the latest release of CA-Pan/SQL for the CA product that you are currently installing. After installing the latest release of CA-Pan/SQL, any other CA product that uses CA-Pan/SQL should also use the latest release. Always install the new release in a separate library and provide a new name for the "Interface Command Processor" where applicable. (See the specific interface for more information about the "Interface Command Processor.")

Operating Environment

CA-Pan/SQL supports the following database management systems in the following environments:

Database Management System	Environment
DB2 for OS/390 and z/OS	OS/390, z/OS
DB2 Server for VM and VSE	CMS, VSE
Oracle	OS/390, z/OS, and CMS
CA-Datacom/DB	OS/390, z/OS, and VSE
CA-IDMS	OS/390, z/OS, and VSE

Installation Tape

The CA-Pan/SQL system is distributed on a separate tape for each environment for each database management system. Their label formats are shown below:

Environment	Tape Format
VM/CMS	Non-labeled
OS/390 or z/OS	Standard label
VSE	Non-labeled

See the chapter appropriate to your environment for a list of the files that are transferred to your system during installation.

SQL System Dependencies

Several database management system modules are link-edited with the Computer Associates SQL interface modules during the installation process. If maintenance is ever applied to these database modules, you must relink CA-Pan/SQL to incorporate these fixes.

The following database management system modules are linked with CA-Pan/SQL:

DBMS	Environment	DBMS Module	Installation Job/Exec
DB2 for OS/390 and z/OS	OS/390 or z/OS (Batch)	DSNTIAR	SQLINST5
DB2 for OS/390 and z/OS	OS/390 or z/OS (CICS)	DSNCLI, DSNTIAR	SQLINST6
DB2 Server for VSE	VSE (Batch)	ARIPRDID	SQLINST
DB2 Server for VSE	VSE (CICS)	ARIRRTED	SQLINST

DBMS	Environment	DBMS Module	Installation Job/Exec
DB2 Server for VM	VM (CMS)	ARIRVST	DQINSOS or DQINSDOS
Oracle	OS/390 or z/OS (Batch)	HLISTUB	SQLINST
CA-IDMS	OS/390 or z/OS (Batch)	IDMS	
CA-IDMS	OS/390 or z/OS (CICS)	IDMSINTC	
CA-IDMS	VSE (Batch)	IDMS	
CA-IDMS	VSE (CICS)	IDMSINTC	

Chapter

2

CMS Installation

This chapter describes how to install CA-Pan/SQL for each SQL database management system it supports in the CMS environment:

- DB2 Server for VM
- Oracle

DB2 Server for VM

This chapter describes how to install the Computer Associates SQL interface option (CA-Pan/SQL) in **CMS** for both OS simulation and DOS simulation. The installation procedures are basically the same for OS and DOS simulation. Where a difference exists between the two, the specific environment is clearly noted.

The installation procedure transfers CA-Pan/SQL from the installation tape to disk files at your site. File01 of the installation tape contains all of the files necessary to install CA-Pan/SQL for both OS and DOS simulation.

Installation of CA-Pan/SQL for CMS using OS simulation results in the generation of a TXTLIB. Installation of CA-Pan/SQL for DOS simulation results in the generation of a DOSLIB. You should install CA-Pan/SQL in a separate TXTLIB or DOSLIB from the Computer Associates product or products that use CA-Pan/SQL. You **must** install the CA-Pan/SQL DB2 Server for VM interface in a separate TXTLIB from any other CA-Pan/SQL database interface since the interface modules are named the same across the various databases. The name of this TXTLIB or DOSLIB must then be supplied in the EXECs required to execute the host product or products.

To simplify modifications to the host product EXEC, you should install CA-Pan/SQL on the same minidisk as the Computer Associates product using the SQL interface. For EXEC modifications, see the *Getting Started* for each host product.

All CA-Pan/SQL interface modules exist in the TXTLIB or DOSLIB with a prefix of DQSPS. All modules are re-entrant.

The complete installation procedure installs the following components:

- The CA-Pan/SQL Message Extract Program
- The CA-Pan/SQL Views
- The CA-Pan/SQL Interface Command Processor

These components are described below.

CA-Pan/SQL Message Extract Module

The IBM DB2 Server for VM system help tables contain the error messages associated with SQL error codes. CA-Pan/SQL installation requires preprocessing of **DQSMMTB**, the module that extracts the error messages from the IBM DB2 Server for VM tables and creates a text member in the interface TXTLIB.

CA-Pan/SQL Views

CA-Pan/SQL uses *views* to obtain data from the DB2 Server for VM system catalogs. Authorization can then be granted on the views rather than on the system catalog tables.

CA-Pan/SQL Interface Command Processor

CA-Pan/SQL module DQSMCMD is referred to as the Interface Command Processor. CA-Pan/SQL installation requires that this module be preprocessed and assembled at your site. The source code for DQSMCMD is distributed with CA-Pan/SQL.

Installing CA-Pan/SQL for DB2 Server for VM

The steps to install CA-Pan/SQL for DB2 Server for VM in CMS are:

1. Determine DASD requirements for CA-Pan/SQL files.
2. Transfer installation EXEC and CA-Pan/SQL files.
3. Verify installation of IBM DB2 Server for VM help tables.
4. Modify CA-Pan/SQL message extract program for DB2 Server for VM user ID and password (source member DQSMMTB).
5. Modify CA-Pan/SQL View statements regarding public authorization (optional).
6. Modify and run the installation EXEC:
   - DQINSOS—installation EXEC for CMS OS simulation
   - DQINSDOS—installation EXEC for CMS DOS simulation
7. For CMS DOS installation, verify the output generated from the DOS link edit of the CA-Pan/SQL interface modules.
8. Modify EXEC of Computer Associates host product to incorporate the CA-Pan/SQL interface.

9. CMS TXTLIB maintenance for DB2 Server for VM.

Step 1. Determine DASD Requirements for CA-Pan/SQL Files

The CA-Pan/SQL installation procedure transfers SOURCE and TEXT to your installation disk. Use the table below as a guideline to ensure that adequate DASD space is available for the installation.

Library	4KB Blocks
SOURCE	60
OS TXLIB	60
DOS TXLIB	60
DOSLIB	160
Work Space	500

Step 2. Transfer Installation EXEC and CA-Pan/SQL Files

The CA-Pan/SQL installation tape has an external label identifying the operating system as CMS. To transfer CA-Pan/SQL files from the tape to your disks, have the VM operator:

1. Attach a tape drive to your user ID as 181.
2. Mount the CA-Pan/SQL installation tape.
3. Ready the tape drive.

When the tape is ready, issue the following CMS commands to transfer the file:

```
TAPE REW
TAPE LOAD * * fm
```

where *fm* is the filemode of the read/write CA-Pan/SQL disk.

The following files are transferred:

File	File Type	Description
DQCTGVWS	DATA	Source statements to create the interface catalog views
DQSMMTB	ASMB	Source code for the CA-Pan/SQL message extract program for DB2 Server for VM Version 2.1 or lower
DQSMMTB3	ASMB	Source code for the CA-Pan/SQL message extract program for DB2 Server for VM Version 2.2 or greater
DQSMCMD	ASMB	Source code for the CA-Pan/SQL Interface Command Processor for DB2 Server for VM Version 1 or 2
DQSMCMD3	ASMB	Source code for the CA-Pan/SQL Interface Command Processor for DB2 Server for VM Version 3
DQINSOS	EXEC	Installation EXEC for CMS OS simulation
DQINSDOS	EXEC	Installation EXEC for CMS DOS simulation
DQSQLCTL	CONTROL	Link control statements for generating the CA-Pan/SQL interface DOSLIB for CMS DOS simulation
DQSQLOS	TXTLIB	CA-Pan/SQL TXTLIB for CMS OS simulation
DQSQLDOS	TXTLIB	CA-Pan/SQL TXTLIB for CMS DOS simulation
DQSMVRSN		Data control statement identifying the version, release, and genlevel of CA-Pan/SQL

Step 3. Verify Installation of IBM DB2 Server for VM Help Tables

CA-Pan/SQL reports the SQL errors that a user may encounter during edit/compile or execution phase processing. CA-Pan/SQL obtains the error message text from the IBM DB2 Server for VM help tables. Before you can install CA-Pan/SQL, you must verify that these help tables are installed. The tables are:

- SQLDBA.SYSTEXT1
- SQLDBA.SYSTEXT2

To verify the installation of these help tables, type **help** followed by an SQL error code in an ISQL session. For example, type the following:

```
help -101
```

This is an example of verification of the following:

```
 TOPIC NAME:  -101
-101    SQL COMMAND EXCEEDS 8192 POSITIONS OR AN      INTERNAL
        LIMITATION OF THE SYSTEM. SEPARATE SQL COMMAND INTO
        SMALLER COMMANDS.
```

See the IBM *SQL/Data System Planning and Administration for VM* for a description of the help tables.

Step 4. Modify Message Extract Program DQSMMTB

The source code for the message extract program is distributed with CA-Pan/SQL and transferred to your disk as file DQSMMTB*x* ASMB, where *x* indicates the various versions of the source program. This module contains the SQL statements that retrieve the text data from the IBM SQLDBA.SYSTEXT2 help table that is associated with DB2 Server for VM error codes.

Currently, two versions of the source program are specific to the DB2 Server for VM version and release installed at your site:

- Source member DQSMMTB ASMB must be installed, if your site has DB2 Server for VM Version 2.1 or lower.

- Source member DQMMTB3 must be installed, if your site has DB2 Server for VM Version 2.2 or greater.

The appropriate source member name must be specified in the installation EXEC.

Before you invoke the installation EXEC, you might need to make the following modifications to DQSMMTB or DQSMMTB3:

- Provide the help table name
- Supply user ID and password

These modifications are described below.

Provide the Help Table Name

Because DQSMMTB*x* contains the SQL statements to select data from the help text table, the message extract program explicitly references the table by the name of SQLDBA.SYSTEXT2. If the IBM help table is installed with a name other than SQLDBA.SYSTEXT2, then you must modify the source code for module DQSMMTB*x* to reflect the correct table name.

The table name is located at approximately line 114 in the source code:

```
*************************************************
MESSAGE     DS    0H
        EXEC SQL                                 X
              DECLARE C1 CURSOR FOR              X
              SELECT ITEM, "SQL/DS HELP"         X
              FROM  SQLDBA.SYSTEXT2              X
              WHERE ITEM >= :WKITEM
*************************************************
```

Supply User ID and Password

DQSMMTB*x* must also contain the SQL CONNECT statement. DQSMMTB*x* uses a user ID of SQLDBA and a password of SQLDBAPW when executing the CONNECT statement. The DQINSOS or DQINSDOS EXEC uses a user ID and password of SQLDBA and SQLDBAPW for all preprocess steps. To install DQSMMTB*x*, you must do one of the following:

- Supply the correct password for the SQLDBA user ID in the DQSMMTB*x* source code and the DQINSOS or DQINSDOS EXEC.
- Temporarily change the password for the SQLDBA user ID to SQLDBAPW for the duration of the CA-Pan/SQL installation. This eliminates the necessity of source code modifications and reduces the number of EXEC changes.

Through either method, the user ID and password provided for the CONNECT statement variables in DQSMMTB*x* must be the same as the user ID and password specified in the DQINSOS or DQINSDOS EXEC.

The source statements containing the user ID and password for the CONNECT statement are located at approximately lines 573 and 574 in source member DQSMMTB, and lines 1021 and 1022 in source member DQSMMTB3:

```
            EXEC SQL BEGIN DECLARE SECTION
CPYWRGHT DC  H'30000'
CMDITEM  DC  H'19099'
WKITEM   DC  H'19099'
ITEM205  DC  H'20205'
USERID   DC  CL8'SQLDBA  '
PASSWORD DC  CL8'SQLDBAPW'
         DC  C'CMDMSG'
CMDMSTXT DC  CL60' '
            EXEC SQL END DECLARE SECTION
```

Step 5. Modify CA-Pan/SQL Views Statements

The DQINSOS and DQINSDOS EXECs create views that are used by CA-Pan/SQL. File DQCTGVWS DATA contains the SQL statements to create these views. This file also contains the GRANT statements to grant public access to the views. If you do not want public access granted on these views, you must delete the GRANT statements from DQCTGVWS DATA.

The owner ID of the views is SQLDBA. Because the Interface Command Processor module must be preprocessed with an owner ID of SQLDBA, the owner ID of the views named in the Interface Command Processor defaults to SQLDBA. Therefore, the CREATE VIEW statements must not be modified.

The SQL statements below create the interface catalog views.

```
DROP   VIEW SQLDBA.DQUSERID
SET RUNMODE CONTINUE
DROP   VIEW SQLDBA.DQTBLECOLS
SET RUNMODE CONTINUE
DROP   VIEW SQLDBA.DQUSERTPRV
SET RUNMODE CONTINUE
DROP   VIEW SQLDBA.DQSYNONYMS
SET RUNMODE CONTINUE
CREATE VIEW SQLDBA.DQUSERID -
    (USERID) -
AS SELECT -
     SQLDBA.SYSUSERLIST.NAME -
FROM -
     SQLDBA.SYSUSERLIST
  CREATE VIEW SQLDBA.DQTBLECOLS -
     (TBLOWNER, -
     TBLNAME, -
     COLNAME, -
     DATATYPE, -
     UNIQUEVALUES, -
     COLPOS, -
     DATALEN, -
     SYSLENGTH, -
     NULLS, -
     LABEL) -
  AS SELECT -
     SYSTEM.SYSCOLUMNS.CREATOR, -
     SYSTEM.SYSCOLUMNS.TNAME, -
     SYSTEM.SYSCOLUMNS.CNAME, -
     SYSTEM.SYSCOLUMNS.COLTYPE, -
     SYSTEM.SYSCOLUMNS.COLCOUNT, -
     SYSTEM.SYSCOLUMNS.COLNO, -
     SYSTEM.SYSCOLUMNS.LENGTH, -
     SYSTEM.SYSCOLUMNS.SYSLENGTH, -
```

```
                  SYSTEM.SYSCOLUMNS.NULLS, -
                  SYSTEM.SYSCOLUMNS.CLABEL -
                FROM -
                  SYSTEM.SYSCOLUMNS
               CREATE VIEW SQLDBA.DQUSERTPRV -
                  (GRANTEE, -
                  TBLOWNER, -
                  TBLNAME, -
                  GRANTOR, -
                  UPDATECOLS, -
                  SELECTPRIV, -
                  INSERTPRIV, -
                  DELETEPRIV, -
                  UPDATEPRIV, -
                  TBLTYPE, -
                  TBLDESCR) -
               AS SELECT -
                  SYSTEM.SYSTABAUTH.GRANTEE, -
                  SYSTEM.SYSTABAUTH.TCREATOR, -
                  SYSTEM.SYSTABAUTH.TTNAME, -
                  SYSTEM.SYSTABAUTH.GRANTOR, -
                  SYSTEM.SYSTABAUTH.UPDATECOLS, -
                  SYSTEM.SYSTABAUTH.SELECTAUTH, -
                  SYSTEM.SYSTABAUTH.INSERTAUTH, -
                  SYSTEM.SYSTABAUTH.DELETEAUTH, -
                  SYSTEM.SYSTABAUTH.UPDATEAUTH, -
                  SYSTEM.SYSCATALOG.TABLETYPE, -
                  SYSTEM.SYSCATALOG.REMARKS -
                FROM -
                  SYSTEM.SYSTABAUTH, -
                  SYSTEM.SYSCATALOG -
                WHERE -
                  SYSTEM.SYSTABAUTH.TCREATOR =
SYSTEM.SYSCATALOG.CREATOR AND -
                  SYSTEM.SYSTABAUTH.TTNAME   = SYSTEM.SYSCATALOG.TNAME
              CREATE VIEW SQLDBA.DQSYNONYMS -
                   (USERID, -
                   ALTNAME, -
                   TBLOWNER, -
                   TBLNAME) -
              AS SELECT -
                   SYSTEM.SYSSYNONYMS.USERID, -
                   SYSTEM.SYSSYNONYMS.ALTNAME, -
                   SYSTEM.SYSSYNONYMS.CREATOR, -
                   SYSTEM.SYSSYNONYMS.TNAME -
              FROM -
                   SYSTEM.SYSSYNONYMS
              GRANT SELECT ON SQLDBA.DQUSERID TO PUBLIC
              GRANT SELECT ON SQLDBA.DQTBLECOLS TO PUBLIC
              GRANT SELECT ON SQLDBA.DQUSERTPRV TO PUBLIC
              GRANT SELECT ON SQLDBA.DQSYNONYMS TO PUBLIC
```

Step 6. Modify and Run Install EXEC

Modify the DQINSOS (CMS/OS) or DQINSDOS (CMS/DOS) EXEC by specifying values for the variables below.

Variable	Value
&SQLVM	Provide the user ID that owns the DB2 Server for VM minidisk. The default is SQLDBA.
&SQLCCU	Provide the address of the DB2 Server for VM minidisk in &SQLVM's directory. The default is 195.
&SQLVUU	Provide the virtual address to link the DB2 Server for VM minidisk to.
&SQLMODE	Provide the CMS filemode in which to access the DB2 Server for VM minidisk. The default is Q.
&SQLPSWD	Provide the password for the SQLDBA user ID (the value of &SQLPSWD must be the same as the value specified for PASSWORD in DQSMMTB). The default is SQLDBAPW.
&PREPCMD	Provide the name given to the access module for the Interface Command Processor. The default is DQPS024.
&PREPMTB	Provide the name given to the access module for the message extract program. The default is DQSMMTB.
&DQSMMTB	Provide the name of the source member for the CA-Pan/SQL message extract program. The default is DQSMMTB, which is valid for DB2 Server for VM Version 2.1. If you are running DB2 Server for VM Version 2.2 or greater, you must change the name of the value to DQSMMTB3.

Variable	Value
&DQSMCMD	Provide the name of the source member for the CA-Pan/SQL Interface Command Processor. The default is DQSMCMD, which is valid for installations using DB2 Server for VM Version 1 or 2. If you are running DB2 Server for VM Version 3, you must change the name of this value to DQSMCMD3.
&TEMPMOD	Provide the CMS filemode of the minidisk used to hold the work data sets and the DOSLIB created during the install process. One cylinder of 3380 work space is required for both CMS/OS and CMS/DOS.
&INSTALL	Specify the type of installation. This parameter applies only to a CMS DOS installation. Valid values are: FULL RELINK Specify FULL for a complete installation of CA-Pan/SQL. Specify RELINK when only a relink is required after maintenance has been applied to the CA-Pan/SQL interface. The default value is FULL.
&DQSQLLIB	Specify the name to be used for the DOSLIB that is generated. This parameter applies only to a CMS DOS installation. The default value is DQSQLDOS.

Note: Before executing the installation EXEC, you must already have run the DB2 Server for VM SQLINIT EXEC. SQLINIT places the modules ARISISBT and ARISRMBT on your **A** disk. You must also have write access to the minidisk containing the DQSQLOS or DQSQLDOS TXTLIBs.

While the installation EXECs install the CA-Pan/SQL interface onto the disk accessed as &TEMPMOD, DB2 Server for VM requires write access to an A disk with approximately 500 (4KB) blocks of available space.

To install CA-Pan/SQL for CMS OS simulation, invoke EXEC

```
DQINSOS
```

To install CA-Pan/SQL for CMS DOS simulation, invoke EXEC

```
DQINSDOS
```

The EXECs are listed later in this chapter.

Step 7. Verify Output from the DOS Link Edit (CMS DOS Simulation)

After the execution of the DQINSDOS EXEC has completed, you must verify the output generated from the DOS link edit for each of the 13 CA-Pan/SQL interface modules. The output is routed to your CMS printer. Each step should complete with a condition code of zero. You should retain a copy of this output for your records.

Step 8. Modify EXEC of Host Product

When the installation of CA-Pan/SQL completes, see the *Getting Started* of the Computer Associates product that uses CA-Pan/SQL.

If the host product is a product that runs under CA-Easytrieve/ESP, you must modify the ESP EXEC as follows. Within the lines commented by **/* SQL**:

- Specify values for all parameters prefixed by SQL and PSQL to provide access to the DB2 Server for VM and CA-Pan/SQL minidisks.
- If you changed the name of the CA-Pan/SQL TXTLIB (CMS OS simulation) or the CA-Pan/SQL DOSLIB (for CMS DOS simulation), provide the new name in the GLOBAL TXTLIB or GLOBAL DOSLIB statement.

- Uncomment all statements from:

  ```
  /* SQLDSID = Minidisk name
  ```

  through

  ```
  /* SQL END
  ```

  by deleting the /* and */ comment characters.

Step 9. CMS TXTLIB Maintenance for DB2 Server for VM

The following CA-Pan/SQL files will remain on your installation disk at the completion of the CA-Pan/SQL install:

```
DQSMMTB ASMB
DQSMMTB3ASMB
DQSMCMD ASMB
DQSMCMD3ASMB
DQCTGVWSDATA
DQSQLCTLCONTROL
DQINSOS EXEC
DQINSDOSEXEC
DQSQLOS TXTLIB
DQSOLDOSTXTLIB
DQSQLDOSDOSLIB (created for CMS/DOS simulation only)
DQSMVRSNDATA
```

You must keep these files in the event it becomes necessary to:

- Apply maintenance to the SQL interface
- Reinstall the SQL interface due to a new version or release of the IBM DB2 Server for VM product

CMS provides the ZAP command to apply maintenance to a CMS TXTLIB. For CMS OS simulation, maintenance is applied to DQSQLOS TXTLIB. For CMS DOS simulation, maintenance is applied to DQSQLDOS TXTLIB. See the *VM/SP Operator's Guide* (SC19-6202) for complete information on the ZAP TXTLIB command.

If maintenance is applied to the DQSQLDOS TXTLIB, you must relink the DQSQLDOS DOSLIB. To relink the CA-Pan/SQL DOSLIB, simply execute the installation EXEC, DQINSDOS EXEC, and specify the value of RELINK for the &INSTALL variable.

Oracle

The installation procedure transfers the CA-Pan/SQL interface TXTLIB from the installation tape to a disk file at your site. You should install CA-Pan/SQL for Oracle in a separate TXTLIB from the Computer Associates product or products using the SQL interface.

You **must** install the CA-Pan/SQL Oracle interface in a separate TXTLIB from any other CA-Pan/SQL database interface since the interface modules are named the same across the various databases. The name of this TXTLIB must then be supplied in the EXECs required to execute the host product or products.

To simplify modifications to the host product EXEC, you should install CA-Pan/SQL on the same minidisk as the Computer Associates products that use CA-Pan/SQL. For EXEC modifications, see the *Getting Started* for each host product.

Installing CA-Pan/SQL for Oracle

The steps to install CA-Pan/SQL for Oracle in CMS are:

1. Determine DASD requirements for CA-Pan/SQL files.
2. Transfer the CA-Pan/SQL TXTLIB from the tape to disk files.
3. Modify EXEC of host product.
4. Apply maintenance to the CA-Pan/SQL interface for Oracle.

Step 1. Determine DASD Requirements for the CA-Pan/SQL Oracle Interface

The total disk space required for the CA-Pan/SQL Oracle TXTLIB is approximately 50 blocks on a minidisk formatted with a block size of 4096 bytes.

Step 2. Transfer CA-Pan/SQL Oracle Interface

The installation tape has an external label identifying the operating system as CMS. To transfer the CA-Pan/SQL file from the tape to your disk, have the VM operator:

1. Attach a tape drive to your user ID as 181.
2. Mount the CA-Pan/SQL installation tape.
3. Ready the tape drive.

When the tape is ready, issue the following CMS commands:

```
TAPE REW
TAPE LOAD * * fm
```

where *fm* is the filemode of the read/write CA-Pan/SQL disk. This transfers file DQSQLOS TXTLIB to your disk. The installation of the CA-Pan/SQL Oracle interface is complete.

Step 3. Modify EXEC of Host Product

See the *Getting Started* of the Computer Associates host product that uses the CA-Pan/SQL interface for additional EXEC modifications.

Step 4. CMS TXTLIB Maintenance for Oracle

CMS provides the ZAP command to apply maintenance to a CMS TXTLIB. If it becomes necessary to apply maintenance to the CA-Pan/SQL interface for Oracle, you will receive a CMS ZAP TXTLIB file (IMASPZAP format) from Computer Associates. This maintenance is to be applied to DQSQLOS TXTLIB.

See the *VM/SP Operator's Guide* (SC19-6202) for complete information on the ZAP TXTLIB command.

Chapter 3

z/OS and OS/390 Installation

This chapter describes how to install CA-Pan/SQL for each SQL database management system it supports in the z/OS and OS/390 environment:

- DB2 for z/OS and OS/390
- Oracle
- CA-Datacom/DB
- CA-IDMS with SQL

DB2 for z/OS and OS/390

This section describes how to install the Computer Associates SQL interface option (CA-Pan/SQL) for DB2 for z/OS and OS/390. This process is intended for the experienced z/OS or OS/390 systems programmer who is familiar with SMP/E.

Product Component Structure

The complete installation procedure installs the following components:

- CA-Pan/SQL Views
- CA-Pan/SQL Interface Command Processor
- Batch interface
- CICS interface

Note: If you are operating in TSO or batch only, you can omit the CICS installation without affecting the operation of CA-Pan/SQL. **If you are operating in CICS, however, you must install both the CICS interface and the batch interface**.

Assembling the Interface Command Processor creates an object deck that is linked with both the CICS and the batch interface modules. By installing both interfaces, you avoid the possibility of DB2 for z/OS and OS/390 time stamp errors if the object deck is deleted or the Interface Command Processor is reassembled. Also, the batch interface load library contains module DQSCGEN, which is required for the generation of "static" DB2 for z/OS and OS/390 programs.

The installation components are described next.

CA-Pan/SQL Views

CA-Pan/SQL uses *views* to obtain data from the DB2 for z/OS and OS/390 system catalogs. Authorization can then be granted on the views rather than on the DB2 for z/OS and OS/390 system catalog tables.

CA-Pan/SQL Interface Command Processor

CA-Pan/SQL module DQSMCMD is known as the Interface Command Processor. CA-Pan/SQL installation requires that you preprocess and assemble this module, customizing options to your site's requirements. The source code for DQSMCMD is distributed with CA-Pan/SQL.

Because the Command Processor is used by several Computer Associates products in both CICS and batch, your customization of DQSMCMD must satisfy the requirements of the various products in both environments.

The preprocess step creates a DBRM that provides input to the DB2 for z/OS and OS/390 bind step. Assembly of the Command Processor creates an object deck that is linked with both CICS and batch interface modules.

TSO and Batch Interface

CA-Pan/SQL installation for the TSO and batch environment consists of an APPLY step followed by the assembly of the Interface Command Processor to produce an object deck. This deck is subsequently linked into many of the modules produced in the APPLY in a non-SMP/E step.

CICS Interface

CA-Pan/SQL installation for CICS includes updating the CICS tables and a series of link-edit steps, the first of which occurs during the APPLY step. A second SMP/E controlled link-edit step resolves the common modules from the batch product. A further non-SMP/E link-edit takes the Interface Command Processor created during the batch install and links it into the several CICS load modules which require it.

Installation Tape

The CA-Pan/SQL installation tape has an external label identifying the operating systems as z/OS and OS/390. The installation tape is a standard labeled tape. The volume serial number is PSyymm, where yymm is the maintenance level (for example, PS0007). The layout of the tape is shown in the table that follows.

Tape Layout Table

File #	File Name	Description
1 - 8	Not used	
9	CAI.xxxxxx.SAMPJCL	Install JCL
10-24	Not used	
25	CAI.PSQL.BOOKSHLF	Online documentation in IBM BookManager format (includes a bookshelf and search index)
26	CAI.PSQL.BOOKS	Online documentation in IBM BookManager format (includes individual books)
27	CAI.PDF	Online document in Adobe Acrobat format (includes a search index)
28-31	Not used	
32	SMPMCS	MCS files defining SYSMODS
33-37	SMP/E Rel files	

Note: In the preceding table, *xxxxxx* identifies the CA-Pan/SQL genlevel.

Disk Space

Before installing CA-Pan/SQL, review the following table for adequate space availability:

Data Set	Description	3390 Tracks	Block Size
SAMPJCL	Sample JCL file	15	3120
CAIMAC	Macro & Source (Batch)	10	3120
COMMON. CAILIB	Target Common Executable	10	6144
CAILIB	Target Load (Batch)	30	6144
CB2ALLD	Dist. Load (BATCH)	10	6144
CB2AMLD	Dist. Macro & Source (BATCH)	10	3120
CC55SRT	Target Source (CICS)	1	3120
CICSLOAD	Target Load (CICS)	30	6144
CC55SRD	Dist. Source (CICS)	1	3120
CC55LLD	Dist. Load (CICS)	10	6144
SMPMTS	SMP MTS	30	3120
SMPSCDS	SMP SCDS	30	3120
SMPSTS	SMP STS	15	3120
CB2A240. SMPLTS	“Base” load module repository (Batch)	30	6144
CC55240. SMPLTS	"Base" load module repository (CICS)	30	6144
SMPPTS	SMP PTS	30	3120
SMPCSI	SMP CSI	60	4096

Installing or Upgrading CA-Pan/SQL

For each release of CA-Pan/SQL, new product libraries and files are allocated. Therefore, the initial installation and upgrade procedures are the same.

The steps to install or upgrade CA-Pan/SQL at your site are:

1. Load Sample JCL from the tape.
2. Unload IBM BookManager files from tape.
3. Unload PDF files from tape.
4. Complete the installation worksheet.
5. Edit and run the install jobs.

Step 1: Load Sample JCL

The product tape cartridge received with this package contains all the data necessary to install CA-Pan SQL, using SMP/E. It is a standard label tape cartridge. Prior to installing the product, load the sample JCL library from the tape. This is the ninth data set (DSN=CAI.SAMPJCL) on the tape and is in IEBCOPY unloaded format. Use the following JCL as a model to load the sample JCL library DASD.

```
//*============================================================
//* THIS LOADS THE SAMPLE JCL FILE FROM THE PRODUCT TAPE
//*
//* FILE 9 - CA-PANSQL SAMPLE INSTALL JCL LIBRARY PDS
//*============================================================
//LOAD      EXEC PGM=IEBCOPY
//SYSPRINT  DD SYSOUT=*
//SYSIN     DD DUMMY
//SYSUT1    DD DISP=(OLD,KEEP),
//             DSN=CAI.SAMPJCL,
//             UNIT=CART,
//             VOL=(,RETAIN,SER=PSyymm), <==yymm is the genlevel
//             LABEL=(9,SL)
//SYSUT2    DD DISP=(NEW,CATLG,DELETE),
//             DSN=pansql.install.jcl,  <== change DSN
//             UNIT=SYSDA,
//             VOL=SER=volser,          <== supply volser
//             SPACE=(3120,(100,10,5)),
//             DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120)
//
```

Customize the JCL to reflect valid JOB statements, data set names, unit, and volume serial numbers on the SYSUT2 DD statement, and submit the job. After this job ends, your library contains all of the JCL needed to complete the installation of CA-Pan/SQL

Step 2: Unload BookManager Files from Tape

The CA-Pan/SQL documentation is provided in IBM BookManager format on the CA-Pan/SQL installation cartridge in files 25 and 26.

Use sample JCL member CB2ABMGR to unload the BookManager READ files using IEBGENER:

```
//CB2ABMGR JOB (),'BOOKMANAGER',NOTIFY=&SYSUID,
*
// CLASS=T,MSGCLASS=X
*
//****************** < DESCRIPTION BEGIN >********************
//*                                                           *
//* NAME      : CB2ABMGR                                      *
//* PRODUCT   : CA-PANSQL                                     *
//* TYPE      : SAMPLE INSTALLATION JCL                       *
//*                                                           *
//* DESCRIPT. : IBM BOOKMANAGER BOOKSHELVES                   *
//*                                                           *
//* NOTICES:THIS MODULE IS PART OF THE DISTRIBUTED SOURCE CODE*
//*         FOR CA-PANSQL.                                    *
//*                                                           *
//*       COPYRIGHT (C) 2001 COMPUTER ASSOCIATES INTL.,INC.   *
//*       ALL RIGHTS RESERVED.                                *
//*                                                           *
//*        THIS SOFTWARE IS PROPRIETARY INFORMATION AND ITS   *
//*        USE BY UNAUTHORIZED PERSONS IS PROHIBITED.         *
//*                                                           *
//*       THIS SOFTWARE MAY BE MODIFIED TO INSTALLATION NEEDS *
//*       OR STANDARDS, AND MAY CONTAIN INSTRUCTIONS FOR BOTH *
//*       NECESSARY OR OPTIONAL MODIFICATIONS.                *
//*                                                           *
//***************** < DESCRIPTION END > ***********************
```

```
//***************** < DOCUMENTATION BEGIN > ********************
//*                                                             *
//* FUNCTION  : BUILD BOOKMANAGER BOOKSHELVES                   *
//*                                                             *
//* OUTPUT/   : CA-PANSQL BOOKS ADDED TO BOOKMANAGER            *
//* OUTCOME                                                     *
//*                                                             *
//* SUMMARY: STEP NAME     DESCRIPTION/FUNCTION                 *
//*          -----------   ------------------------------       *
//*          BKSHELF     CREATE THE BOOKSHELF FILE             *
//*          UNLOAD      UNLOAD THE BOOKMANAGER FILES IN PDS   *
//*                      FORMAT                                 *
//*          BKINDEX     CREATES THE INDEX FILE                *
//*          BOOK240*    CREATES THE INDIVIDUAL BOOK FILES     *
//*                                                             *
//* THE CA-PANSQL BOOKSHELF IS ON THE DISTRIBUTION TAPE IN      *
//* FILE 25                                                     *
//* CAI.BOOKSHLF(SEQ FILE).                                     *
//*                                                             *
//* THE CA-PANSQL MANUALS ARE ON THE DISTRIBUTION TAPE IN FILE* 
//* 26                                                          *
//* CAI.BOOKS(AN UNLOADED PDS).                                 *
//*                                                             *
//* THESE MANUALS ARE PROVIDED IN A FORM FOR VIEWING VIA        *
//* BOOKMANAGER                                                 *
//* READER UNDER MVS, WINDOWS/NT, WINDOWS 2000, OR WINDOWS 98.* 
//*                                                             *
//* EDIT THE JCL STATEMENTS BELOW TO CONFORM TO YOUR SITE       *
//* STANDARDS.                                                  *
//*                                                             *
//* NOTE: CHANGING THE BKMPFX VARIABLE CHANGES THE HLQ (HIGH    *
//* LEVEL QUALIFIER) OF THE BOOK FILENAME.                      *
//* CHANGING THE BKMSFX VARIABLE CHANGES THE SUFFIX, OR LOW     *
//* LEVEL QUALIFIER OF THE BOOK FILENAME.                       *
//* THE BOOKSHELF CONTAINS THE NAME OF EACH DATA SET WHERE A    *
//* A BOOK RESIDES. IF THE VALUE OF BKMPFX OR BKMSFX IS         *
//* CHANGED,THEN THE SAME CHANGE MUST BE MADE TO THE DATASET    *
//* NAMES IN THE BOOKSHELF AFTER THIS JOB IS RUN.               *
//*                                                             *
//* EXAMPLE: BKMPFX IS SET TO 'CAI.'.IF YOU CHANGE THIS VALUE   *
//* YOU MUST EDIT THE BOOKSHELF TO CHANGE ALL REFERENCES OF     *
//* 'CAI.' TO WHATEVER VALUE YOU SPECIFIED FOR BKMPFX.          *
//* IF THE VALUE OF BKMSFX IS CHANGED TO SOMETHING OTHER THAN   *
//* BOOK, THEN THE LOW LEVEL QUALIFIER OF THE BOOK DATASET      *
//* NAMES MUST ALSO BE CHANGED.                                 *
//*                                                             *
//***************** < DOCUMENTATION ENDS > ********************
//*
// SET   TAPE=CART          /* GENERIC UNIT NAME FOR TAPE DRIVE
// SET TAPVOL='PS0203'      /* TAPE VOLSER * DO NOT CHANGE *
// SET   WORK=VIO           /* GENERIC UNIT NAME FOR WORK FILE
// SET   UNIT=SYSDA         /* GENERIC UNIT NAME FOR DATA SET
// SET VOLSER=VOLSER        /* VOLSER FOR DATASET
// SET BKMPFX='CAI.'        /* COMMON HI-LEVEL QUALIFIER
// SET BKMSFX='.BOOK'       /* DEFAULT BOOK DSN SUFFIX
//*
```

```
//SVBKMGR  PROC MEMBER=
//BOOK1    EXEC PGM=IEBGENER,REGION=4M
//SYSPRINT DD  SYSOUT=*
//SYSIN    DD  DUMMY
//SYSUT1   DD  DISP=SHR,DSN=&BKMPFX.BOOKS(&MEMBER)
//SYSUT2   DD  DSN=&BKMPFX.&MEMBER.&BKMSFX,
//             DISP=(NEW,CATLG,DELETE),
//             UNIT=&UNIT,VOL=SER=&VOLSER,
//             SPACE=(28672,(80,10),RLSE)
//         PEND
//*
//*  CREATE THE CA-PANSQL BOOKSHELF
//*
//BKSHELF  EXEC PGM=IEBGENER,REGION=4M
//SYSPRINT DD  SYSOUT=*
//SYSIN    DD  DUMMY
//SYSUT1   DD  DISP=(OLD,KEEP),DSN=CAI.BOOKSHLF,
//             UNIT=&TAPE,VOL=(,RETAIN,SER=&TAPVOL),
//             LABEL=(25,SL)
//SYSUT2   DD  DSN=&BKMPFX.CAPAS24I.BKSHELF,
//             DISP=(NEW,CATLG,DELETE),
//             UNIT=&UNIT,VOL=SER=&VOLSER,
//             SPACE=(27998,(2,1),RLSE)
//*
//*  UNLOAD THE PDS CONTAINING THE INDEX AND BOOKS
//*
//UNLOAD   EXEC PGM=IEBCOPY,REGION=4M
//SYSPRINT DD  SYSOUT=*
//SYSIN    DD   DUMMY
//SYSUT1   DD  DISP=(OLD,KEEP),DSN=CAI.BOOKS,
//             UNIT=&TAPE,VOL=(,RETAIN,SER=&TAPVOL),
//             LABEL=(26,SL)
//SYSUT2   DD  DSN=&BKMPFX.BOOKS,
//             DISP=(NEW,CATLG,DELETE),
//             UNIT=&UNIT,VOL=SER=&VOLSER,
//             SPACE=(28672,(200,100,2),RLSE)
//SYSUT3   DD  UNIT=&WORK,SPACE=(CYL,(3,3))
//SYSUT4   DD  UNIT=&WORK,SPACE=(CYL,(3,3))
//*
//*  CREATE THE CA-PANSQL BOOKMANAGER INDEX AND BOOK FILES
//*
//BKINDEX   EXEC SVBKMGR,MEMBER=CAPAS24I,BKMSFX='.BKINDEX'
//BOOK24O1  EXEC SVBKMGR,MEMBER=PAS24IS
//BOOK24O2  EXEC SVBKMGR,MEMBER=ESP63IQ
//*
```

The CA-Pan/SQL documentation set consists of one sequential data set and one unloaded PDS file that contain the following:

- The bookshelf definition
- A search index
- The CA-Pan/SQL guides

Note: See Downloading z/OS or OS/390 Files for Use on a PC for a list of the CA-Pan/SQL guides file names and descriptions.

Changing the Prefix in the Bookshelf Definition

The bookshelf definition (*prefix*.BKSHELF) contains the z/OS and OS/390 data set names BookManager uses to reference the other books. The original bookshelf definition uses CAI.MIJ10DOC as the prefix in those data set names. To use BookManager Read on z/OS or OS/390, you must change the references to those data sets by replacing CAI.MIJ10DOC with the prefix used when you unloaded the files.

Downloading z/OS or OS/390 Files for Use on a PC

Perform the actions in this section if you want to download the z/OS or OS/390 files to a PC.

To use the PC versions of BookManager READ, ensure that the book files have been downloaded with a file extension of .BOO. The bookshelf must have an extension of .BKS, and the index should have an extension of .BKI.

The following table describes the sequential files that are provided on the installation tape and lists the commands you can issue to transfer them to a PC:

Name/Description	Format	File Transfer Command on PC
prefix.CAPAS24I.BKSHELF Bookshelf definition	Variable block ASCII CRLF	RECEIVE <*dir*>\CAPAS24I.BKS '*prefix*.CAPAS24I.BKSHELF'
prefix.CAPAS24I.BKINDEX Search index	Fixed block LRECL 4096 Binary	RECEIVE <*dir*>\CAPAS24I.BKI '*prefix*.CAPAS24I.BKINDEX'
prefix.CAPAS24I.PAS24IS Getting Started Guide	Fixed block LRECL 4096 Binary	RECEIVE <*dir*>\PAS24IS.BOO '*prefix*.CAPAS24I.PAS24IS'

Step 3: Unload PDF Files from Tape

The CA-Pan/SQL documentation is provided in Adobe PDF format on the CA-Pan/SQL installation cartridge in file 18.

Unloading the Archive File from Tape

Use the following procedures to unload documentation files in PDF format from the product tape.

z/OS and OS/390

Use IEBGENER to unload the archive file from an z/OS or OS/390 tape to a sequential file. The file, *your.pansql.sampjcl*, contains the sample JCL:

```
//CB2APDF  JOB (),'CA-PANSQL PDF',NOTIFY=&SYSUID,
// CLASS=T,MSGCLASS=X
//******************** < DESCRIPTION BEGIN >*********************
//*                                                              *
//* NAME      : CB2APDF                                          *
//* PRODUCT   : CA-PANSQL                                        *
//* TYPE      : SAMPLE INSTALLATION JCL                          *
//*                                                              *
//* DESCRIPT. : UNLOAD PDF ARCHIVE                               *
//*                                                              *
//* NOTICES :THIS MODULE IS PART OF THE DISTRIBUTED SOURCE CODE*
//*          FOR CA-PANSQL.                                      *
//*                                                              *
//*      COPYRIGHT (C) 2001 COMPUTER ASSOCIATES INTL., INC.      *
//*      ALL RIGHTS RESERVED.                                    *
//*                                                              *
//*      THIS SOFTWARE IS PROPRIETARY INFORMATION AND ITS        *
//*      USE BY UNAUTHORIZED PERSONS IS PROHIBITED.              *
//*                                                              *
//*      THIS SOFTWARE MAY BE MODIFIED TO INSTALLATION NEEDS     *
//*      OR STANDARDS, AND MAY CONTAIN INSTRUCTIONS FOR BOTH     *
//*      NECESSARY OR OPTIONAL MODIFICATIONS.                    *
//*                                                              *
//*************** < DESCRIPTION END >**************************
//*************** < DOCUMENTATION BEGIN > **********************
//*                                                              *
//* FUNCTION  : UNLOAD CA-PANSQL PDF ARCHIVE                     *
//*                                                              *
//* OUTPUT/   : PDF ARCHIVE RESTORED FROM DISTRIBUTION MEDIA     *
//* OUTCOME                                                      *
//*                                                              *
//* SUMMARY : STEP NAME   DESCRIPTION/FUNCTION                   *
//*           ----------- ------------------------------         *
//*           DOWNLOAD    DOWNLOADS THE PDF ARCHIVE FILE FROM  *
//*                       TAPE                                    *
//*                                                              *
```

```
//******************** < DOCUMENTATION END >******************
//*
// SET   TAPE='CART'        /* GENERIC UNIT NAME FOR TAPE DRIVE
// SET TAPVOL='PS0203'      /* TAPE VOLSER * DO NOT CHANGE *
// SET   UNIT=SYSDA         /* GENERIC UNIT NAME FOR DATA SET
// SET VOLSER=VOLSER        /* VOLSER FOR DATASET
// SET    CAI='CAI.'        /* COMMON HI-LEVEL QUALIFIER
//*
//*  DOWNLOAD THE PDF ARCHIVE FILE FROM TAPE
//*
//DOWNLOAD  EXEC PGM=IEBGENER
//SYSPRINT  DD  SYSOUT=*
//SYSIN     DD  DUMMY
//SYSUT1    DD  DISP=(OLD,KEEP),DSN=CAI.PDF,
//              UNIT=&TAPE,VOL=(,RETAIN,SER=&TAPVOL),
//              LABEL=(27,SL)
//SYSUT2    DD  DSN=&CAI.CB2APDF,
//              DISP=(NEW,CATLG,DELETE),
//              UNIT=&UNIT,VOL=SER=&VOLSER,
//              SPACE=(CYL,(20,10),RLSE)
```

UNIX and LINUX

At the command prompt, enter:

```
dd if= tapedevice of= archivename.tar.z
```

Moving Compressed Archive File to Another Platform

This step is optional.

Once unloaded, you can move the compressed archive file to a platform that supports the Adobe Acrobat Reader.

Use a binary file transfer program and download the compressed archive file to the target platform. For example, use FTP with the binary option or IND$FILE with no translation (for z/OS and OS/390 clients).

Restoring PDF Files and Directory Structure

Uncompress the archive file on the target platform.

Windows 9x

If available, use WinZip 7.0 or above. Save the restored files to the drive and directory of your choice.

Windows NT and 2000

Use one of the following methods:

If available, use WinZip 7.0 or above. Save the restored files to the drive and directory of your choice.

Enter the following at a command prompt:

```
gzip -d archivename.tgz
pax -r -f archivename.tar
```

Move the files to the drive and directory of your choice.

Note: gzip is a nonstandard utility freely and easily available from www.gzip.org. The pax (Portable Archive Interchange) utility is standard.

UNIX

Use the following commands:

```
uncompress archivename.tar.z
tar xvf archivename.tar
```

Move the files to the drive and directory of your choice.

z/OS and OS/390 USS

Use the following commands:

```
gzip -d archivename.tgz
pax -r -f archivename.tar
```

Note: gzip is a nonstandard utility freely and easily available from www.gzip.org. The pax (Portable Archive Interchange) utility is standard.

Move the files to the drive and directory of your choice.

LINUX

Use the following commands:

```
gzip -d archivename.tgz
tar xvf archivename.tar
```

Note: gzip is a nonstandard utility freely and easily available from www.gzip.org. The tar utility is standard.

Move the files to the drive and directory of your choice.

Reading Documentation Files

You can use the HTML file supplied with the PDF files to select individual books in the downloaded set for the Computer Associates product. When you click on a title, your PC should launch Adobe Acrobat Reader and open the selected manual.

Alternately, start your Adobe Acrobat Reader with search capabilities to open one of the PDF files in the directory. You can download the Acrobat Reader at www.adobe.com.

Step 4: Complete Installation Worksheet

Following worksheet identifies the decisions you need to make for installation and helps you set consistent variable names in the remaining installation steps.

Complete the installation worksheet before beginning the installation process.

General Installation Parameters

Description	Parameter Name	Value
Install tape unit type. Default is TAPE=CART	TAPE	
Sysout unit for standard printed output Default is SYSOUT='*'	SYSOUT	
Disk unit type. Default is UNIT=SYSDA	UNIT	
Installation generic unit name for DASD devices. Default is PERMDA=DISK	PERMDA	
Installation generic unit name for temporary work DASD volumes. Default is WORK=VIO	WORK	

Description	Parameter Name	Value
Name of your System or User Procedure library	PROCLIB	
Disk VOLSER for CA-Pan/SQL SMPE/E files. Default is VOLSER=VOLSER	VOLSER	

CA-Pan/SQL SMP/E Parameters

Description	Parameter Name	Value
High-level qualifier for CA-Pan/SQL SMP/E files: LTS, SCDS, MTS, PTS, STS. Defaults are SMP='CAI'. and SMP='SMP'. (for LTS)	SMP	
Disk VOLSER for CA-Pan/SQL SMP/E SMPLTS datasets. Default is SMPSER=SMPSER	SMPSER	
High-level qualifier for CA-Pan/SQL SMP/E target, distribution and zone data sets. These are cataloged, permanent data sets. Default is CAI='CAI.'	CAI	
Disk VOLSER for CA-Pan/SQL SMP/E target data sets	TLIB	

SMP/E CSI VSAM Data Set Parameters

Description	Parameter Name	Value
Specify the full data set name of the new CSI that is to be created or the data set name of an existing CSI to be used for the CA-Pan/SQL installation. The low-level qualifier must be CSI	CSI	

Description	Parameter Name	Value
Specify the name of the SMP/E OPTIONS entry to be used for CA-Pan/SQL. Default is CAIOPT.	OPTIONS	
Specify the name of the CA-Pan/SQL Target Zone (Limited to 7 characters). Default is CAITGT.		
Specify the name of the CA-Pan/SQL Distribution Zone (Limited to 7 characters). Default is CAIDLIB.		

CA-Pan/SQL Installation Customization Parameters

Description	Parameter Name	Value
Specify the OwnerID for the CA-Pan/SQL views. Default is PANSQL24.	VWOWNER	
Specify the maximum number of non-cursor SQL statements. Default is 10.	MAXSTMT	
Specify the maximum number of SQL cursors that will be declared in a program or transaction. Default is 6.	MAXCUR	
Specify the maximum number secondary Auth IDs or Group Ids. Default is 1.	MAXGRP	
Specify the maximum number of SQL cursors that will be declared with the "WITH HOLD' option. Default is 6.	HLDCUR	
Specify the name of the CA-Pan/SQL DB2 plan. Default is DQPS024	PLAN	
Specify name of the DBRM generated with CA-Pan/SQL interface. Use site convention.	MEMBER	
Specify the isolation level of the CA-Pan/SQL DB2 plan. The default is CS (Cursor Stability).	ISOLATION	
Specify the DB2 Subsystem ID where the CA-Pan/SQL DB2 plan is to be bound	SYSTEM	

Description	Parameter Name	Value
Specify the name of the DB2 utility program DSNTIAD that is to be used for the DB2 bind function. Default is DSNTIAD.	PROGRAM	
Specify the name of the DB2 plan that is associated with the DB2 DSNTIAD PROGRAM. Default is DSNTIAD.	DSNTIAD PLAN	
Specify the name of the DB2 load library that contains the IBM DB2 system.	SSPGM	
Specify the name of the DB2 RUNLIB that contains the module specified in DSNTIAD PROGRAM.	LIB	
Specify the name of the CA-Pan/SQL DBRM library	DBRMLIB	
Specify the version and release level of your IBM DB2 product (VVR)	DB2REL	
Specify your DB2 SYSLIB	DB2.SDSNLOAD	
Specify your CICS SYSLIB	CICSSYS. SDFHLOAD	

Step 5: Edit and Run Install Jobs

The following is a summary of each install job:

Job#	Name	Description
1	CB2AALC (Batch) CC55ALC (CICS)	Allocate Target and Distribution Libraries
2	CAINITE	Allocates and initializes a set of private SMP/E data sets for all Computer Associates products in SMP/E format.
3	CB2ASMPE (Batch) CC55SMPE (CICS)	Customize the SMP/E Procedure. JCL model used in Receive, Apply and Accept.
4	CB2AREC (Batch) CC55REC (CICS)	Executes the SMP/E RECEIVE command for the CA-Pan/SQL product.

Job#	Name	Description
5	CB2AAPP (Batch) CC55APP (CICS)	Executes the SMP/E APPLY command for the CA-Pan/SQL product.
6 (CICS ONLY)	CC55LNK	Cross-Zone Link. Link common code from the batch install.
7	IJ3STGE1	Customizes CA-Pan/SQL Macro, creates views, assembles and pre-processes command program.
8	CB2ACMDL (Batch) CC55CMDL (CICS)	Link DB2 Interface Command Processor DQSMCMD
9	CB2AACC (Batch) CC55ACC (CICS)	Executes the SMP/E ACCEPT command for the CA-Pan/SQL product.

JOB 1: Allocate Target and Distribution Libraries

- Member CB2AALC allocates all the target and distribution libraries required by CA-Pan/SQL for installation and maintenance. Note that many Computer Associates products have common components and common libraries that might already have been installed. If a library has already been allocated, do not reallocate it; instead, specify DUMMY for the appropriate DD statement.
- Edit the JCL found in the SAMPJCL dataset to conform to your installation standards and the previously completed worksheet. The allocations given are the minimum required for installing CA-Pan/SQL. You might want to adjust these values to allow enough free space for maintenance; the more free space you allocate, the less often the libraries are compressed during maintenance. For common libraries already present, be sure there is sufficient space for CA-Pan/SQL.

  These jobs allocate the following data sets:

```
@CAI-HLQ@.CB2ALLD       - distribution load library
@CAI-HLQ@.CB2AMLD       - distribution macro library
@CAI-HLQ@.CAILIB        - target load library
@CAI-HLQ@.COMMON.CAILIB - target load library
@CAI-HLQ@.CAIMAC        - target macro library
```

```
Additionally, for CICS:
@CAI-HLQ@.CC55LLD       - distribution load library
@CAI-HLQ@.CC55SRD    - distribution source library
@CAI-HLQ@.CICSLOAD   - target load library
@CAI-HLQ@.CC55SRT    - target source library
```

where you provide the value for the data set prefix with @SMP-HLQ@.

```
@SMP-HLQ@.CB2A240.SMPLTS     - base target load library
Additionally, for CICS:
@SMP-HLQ@.CC55240.SMPLTS     - base target load library
```

Where you provide the value for the data set prefix with @SMP-HLQ@.

- Modify and submit member CB2AALC and review the output. Execution of JOB1 should complete with a return code of 0.
- If installing CICS, edit and run CC55ALC after verifying the results of CB2AALC.

JOB 2: Allocate Private SMP/E Libraries

Note: This step is not required if SMP/E data sets have already been created during the installation of another Computer Associates product.

Use member CAINITE to allocate and initialize a set of private SMP/E data sets for all Computer Associates products in SMP/E format. This keeps Computer Associates products distinct from other SMP/E data sets in case there are duplicate SMP/E element names. CAINITE also sets up CAI global, target, and distribution zones for Computer Associates products.

You can alter this step to allocate only new target and distribution libraries in an existing set of SMP/E libraries. If you do this, Computer Associates products must be installed into separate zones from IBM products.

- This job allocates the following data sets where you provide the value for the data set prefix with @SMP-HLQ@.

```
@SMP-HLQ@.SMPSCDS    - SMP Save Control Data Set
@SMP-HLQ@.SMPMTS     - SMP Macro Temporary Store
@SMP-HLQ@.SMPSTS     - SMP Source Temporary Store
```

```
@SMP-HLQ@.SMPPTS     - SMP PTS Data Set
```

- This job allocates the following data sets where you provide the value for the data set prefix with @SMPPSQL-HLQ@

```
@CSI-DSN@           - SMP CSI Vsam Data Set
@OPTIONS@           - Global Zone Options Name
@CAI-HLQ@.TGTZONE   - Name of Target Zone-Batch
@CAI-HLQ@.DLBZONE   - Name of Distribution Zone-Batch
@CAI-HLQ@.TGTZONE   - Name of Target Zone-CICS
@CAI-HLQ@.DLBZONE   - Name of Distribution Zone-CICS
```

- An Options entry is added to the global zone of the CSI with a default name of CAIOPT. The Options entry defines the utilities that are to be used by SMP/E. The utility defaults are: Assembler – ASMA90, Linkage Editor –IEWL and Superzap – IMASPZAP. Verify the parameters specified for these utilities.
- Target and distribution zones are also added to the global zone with names that you specify with prefix @CAI-HLQ@. Default names for the batch target and distribution libraries are CAITGT and CAIDLIB, respectfully and C55TGT and C55DLIB for CICS.
- A ZONEDESCRIPTION OF CA-Pan/SQL Release 2.4 is also added.
- Update the JCL 'SET=' values at the beginning of the member.
- Manual changes are required in this job stream to update SYSIN portions beyond the control the procedure's substitutional parameters. Both the IDCAMS and the UCLIN must be manually changed to reflect your chosen CSI name and volume. All lines requirement changes are flagged with <===.
- If not installing CA-Pan/SQL for CICS, all the references to C55DLIB and C55TGT zones may be removed if desired.
- If this job completes with a return code greater than 4, review the output, correct the problem, and resubmit.

Job 3: Customize the SMP/E Procedure

Member CB2ASMPE is the model JCL procedure.

Select the member and modify the JCL to conform to your installation standards and the previously completed worksheet. You should then place this procedure into a system or user procedure library as CB2ASMPE, or save it to be used as instream execution. You might use this procedure in later installation steps.

For CICS, follow the same procedure for CC55SMPE.

Job 4: SMP/E Receive

Member CB2AREC receives all the batch components (functional SYSMODs) of CA-Pan/SQL.

The SYSMOD required for CA-Pan/SQL Release 2.4 is CB2A240 for Batch components and CC55240 for CICS components.

If installing CA-Pan/SQL CICS option, a second JOB, CC55REC, can be run **OR** the FMID, CC55240, can be added to the SELECT statement found in CB2AREC and both products will be downloaded at the same time.

Read all JCL comments before proceeding, and then edit the JCL to conform to your installation standards and the previously completed worksheet. Submit the job and review the output to verify that the RECEIVE processing ran successfully.

If the RECEIVE completes with an SMP/E return code greater than 0, review the output, correct the problem, and resubmit the job.

Note: This step requires one tape drive.

Job 5: SMP/E Apply

Member CB2AAPP applies all the components (functional SYSMODs) of CA-Pan/SQL to the target libraries. SMP/E does not require the distribution libraries to be allocated during APPLY processing.

Read all JCL comments before proceeding, and then edit the JCL to conform to your installation standards and the previously completed worksheet. Submit the job and review the output to verify that the APPLY processing ran successfully.

Execution of this job should complete with a return code of 4. The actual linkage editor return code will be 8 because of unresolved external references taken care of by subsequent processing. Besides informational messages, expected messages from the linkage editor will be IEW2456E, IEW2454W, IEW2646W and IEW2651W.

If the APPLY completes with an SMP/E return code greater than 4, review the output, correct the problem, and resubmit the job.

For CICS sites, once the base product has been run with the predicted results, the CICS CC55APP can be run. This JOB will produce the same type of results.

Job 6: Cross-Zone Link (for CICS ONLY)

Member CC55LNK links the common code from the batch install.

Read all JCL comments before proceeding, and then edit the JCL to conform to your installation standards and the previously completed worksheet. Submit the job and review the output to verify that the LINK processing ran successfully.

Again, the SMP return code is 4 but the linkage editor/binder return code is 8 because of an unresolved module DQSCMD.

If LINK completes with an SMP/E return code greater than 4, review the output, correct the problem, and resubmit the job.

Job 7: Customize CA-Pan/SQL and DB2

This job, IJ3STGE1, creates the views that are used by CA-Pan/SQL, generates the Interface Command Processor, binds the plan for the interface, and authorizes public access on the plan. Care should be taken, prior to the execution of this job, that the necessary CA-Pan/SQL customization parameters and DB2 access authority is granted. For more information, see Non-SMP/E Procedures and Notes.

To run this job successfully, modify the members of your CAIMAC library as follows:

- CTGVIEWS - Supply DB2 system name, PLANNAME and DB2 run library.
- DQBNDPLN - Supply DB2 system name, PLANNAME and DB2 run library.
- OMSMCMD2 - Supply DB2 Release and other variables you wish to update in the DQSMCMD processor.

Also, update the JCL PROC values at the beginning of the member.

For more information, see Non-SMP/E Procedures and Notes.

The job should complete with a return code of 0.

Job 8: Link DQSMCMD

Member CB2ACMDL contains the JCL to link the DB2 Interface Command Processor into several modules. The link is followed by a compress.

The linkage editor control statements are found in the CAIMAC library. Update the CAI prefix with the prefix of the CB2ALLT CAILIB.

This is a non-SMP/E job that yields a return code of 4 from the linkage editor because of AMODE warnings.

For a CICS install, additionally modify and run CC55CMDL. The job should complete with a return code of 0.

Job 9: SMP/E Accept

Member CB2AACC accepts all the components (functional SYSMODs) of CA-Pan/SQL to the distribution libraries.

Read all JCL comments before proceeding, and then edit the JCL to conform to your installation standards and the previously completed worksheet. Submit the job and review the output to verify that the ACCEPT processing ran successfully.

If the ACCEPT completes with an SMP/E return code greater than 0, review the output, correct the problem, and resubmit the job.

After verification, the CICS Job CC55ACC should be run. Also, giving zero condition codes.

SAMPJCL Library Members

Additional SAMPJCL library members are:

CB24BMGR—Contains all the JCL to download documentation in BOOKMANAGER format.

CB2APDF—Contains all the JCL to download documentation in PDF format.

SQLINST4—JCL to install CA-Pan/SQL for an alternate DB2 for z/OS or OS/390 Subsystem (optional).

z/OS and OS/390 Maintenance Procedures

SMP/E maintenance jobs are provided on the maintenance tape. When a maintenance tape is available, you receive a letter that identifies the SYSMOD IDs for the various CA-Pan/SQL components. You must then provide the SYSMOD ID in the JCL that corresponds to the components installed at your site.

Non-SMP/E Procedures and Notes

The following section describes non-SMP/E installation procedures.

Create CA–Pan/SQL Views

Step CTGVIEWS of job IJ3STGE1 creates the views that are used by CA-Pan/SQL.

You can execute the CREATE VIEW statements if you (the user ID on the JOB statement) have System Administrator (SYSADM) authority or SELECT privilege on every table or view named in the CREATE VIEW statements.

Whether you use the default @OWNERID@ of PANSQL24 or select another, the following conditions must be met:

- A DB2 for z/OS or OS/390 System Administrator (SYSADM authority) must grant the owner ID the SELECT privilege on the DB2 for z/OS or OS/390 system catalog tables by executing the following GRANT commands:

  ```
  GRANT SELECT ON SYSIBM.SYSCOLUMNS  TO ownerid WITH GRANT OPTION
  GRANT SELECT ON SYSIBM.SYSSYNONYMS TO ownerid WITH GRANT OPTION
  GRANT SELECT ON SYSIBM.SYSTABLES   TO ownerid WITH GRANT OPTION
  GRANT SELECT ON SYSIBM.SYSTABAUTH  TO ownerid WITH GRANT OPTION
  ```

  where *ownerid* has the same value as @OWNERID@ as defined in the SMP/E installation procedures.

- You must provide a user ID with SYSADM authority on the JOB statement or use the owner ID of the catalog views. The user ID provided on the JOB statement becomes the owner ID of the CA-Pan/SQL interface plan. The plan name is provided on the PLAN parameter, which is input to the ASMMACR.SYSIN statement of the installation job.
- The user ID on the JOB statement must have BINDADD authority.

The source statements in IJ3STGE1 that create the catalog views also contain the DB2 for z/OS and OS/390 GRANT statements to grant the SELECT privilege on all of these views to PUBLIC. If you do not want to grant public access to these views, delete the GRANT statements. Individual access must then be granted as needed.

CA-Pan/SQL Interface Command Processor

Steps ASMMACR, DB2COMP, and ASMCMDP of job IJ3STGE1 generate the Interface Command Processor. Step DB2BIND binds the plan for the interface and authorizes public access on the plan. You must specify seven installation options to generate the Interface Command Processor. These are specified in the SMP/E installation process, but are described in the following:

- Maximum number of non-cursor statements
- Maximum number of cursors declared in any task
- A name for the interface plan
- The owner ID of the catalog views
- The version and release level of your site's IBM DB2 for z/OS or OS/390 program product
- Maximum number of group IDs (secondary authorization IDs) that can be defined for any DB2 for z/OS or OS/390 user
- Maximum number of "Hold" cursors declared in any task

MAXSTMT

This option specifies the maximum number of non-cursor SQL statements that will be defined for the execution of a given user task, transaction, or program. This parameter affects only the dynamic execution of programs. If too small a value is specified, the performance of a user program may be affected due to the repetitive dynamic PREPARE of statements. Any value between 1 and 99 is valid. The default is 10.

MAXCUR

This value specifies the maximum number of cursors that will be defined for the execution of any user task, transaction, or program. This parameter affects only the dynamic execution of the programs. If too small of a value is specified, programs may fail execution, and a warning message is reported at the end of compile phase processing. The user must then specify a larger value for this option and reinstall the interface.

A value between 1 and 99 is valid. The default value is 6. This means that no user program can use more than 6 cursors for execution. The value that is specified affects the size of the CA-Pan/SQL Interface Command Processor, its plan, and each interface module.

PLAN

This value specifies the name for the interface plan. The owner ID of the plan defaults to the user ID specified on the JOB statement. The default plan name is DQPS024.

CA-Pan/SQL obtains the name of the interface plan from the Interface Command Processor, which is link-edited with the various modules of the interface. Therefore, the plan name provided for the generation of the Command Processor must be the same name specified for the plan name in the DB2 BIND statement.

OWNERID

This value specifies the owner ID of the CA-Pan/SQL catalog views. It must match the owner ID specified in the CREATE VIEW statements of source member DQCTGVWS. The default value is PANSQL24.

DB2REL

This value specifies the version (*vv*) and release level (*r*) of the IBM DB2 program product that is used for installing the CA-Pan/SQL interface. The default value is 023. This parameter applies to an z/OS or OS/390 environment only.

The CA-Pan/SQL DB2 for z/OS and OS/390 command processor macro generates the SQL statements that are supported by the SQL interface. Some SQL statements are dependent upon the version/release level of the IBM DB2 for z/OS and OS/390 product.

One such statement is the SET CURRENT SQLID command. This statement is generated only for a DB2REL (version/release) set greater than 051 (*vvr*).

MAXGRP

This value specifies the maximum number of group IDs (secondary authorization IDs) that can be assigned to any DB2 for z/OS and OS/390 user. A value between 1 and 150 is valid. The default value is 10.

Note: If your site does not have secondary authorization implemented or does not have the Computer Associates CA-Easytrieve/IQ product installed, **a value of 1 should be used**.

HLDCUR

This value specifies the maximum number of cursors defined with the With Hold option that will be defined for the execution of a given task, transaction, or program. This parameter is valid only for DB2 for z/OS or OS/390 Release 2.3 or greater.

ENV

This value identifies the environment of the SQL database with which you are going to communicate. Valid values are OS/390, z/OS, OS2, and AIX.

If you are installing CA-Pan/SQL to execute on your z/OS or OS/390 mainframe, but connect to SQL running on an OS/2 or AIX system, then specify OS2 or AIX for this parameter.

The ENV parameter determines which SQL statements are generated by the CA-Pan/SQL Interface Command Processor.

Modify JCL or TSO Logon Procedure

When the installation of the CA-Pan/SQL interface completes, see the *Getting Started* of the Computer Associates product or products that use CA-Pan/SQL. Incorporate the CA-Pan/SQL interface batch load library and the required IBM DB2 for z/OS and OS/390 libraries into the product's runtime JCL or user's TSO procedure.

Note: Under TSO, you must add the SQL interface batch load library and the IBM DB2 for z/OS and OS/390 libraries to each user's TSO logon PROC or in the LNKLST*xx* member of SYS1.PARMLIB.

Under TSO/ISPF, you must add these libraries to the ISPLLIB file statement of your allocation CLIST.

CA-Pan/SQL for CICS

To complete the installation CA-Pan/SQL for CICS:

- Rename the CA-Pan/SQL modules (optional)
- Update the CICS PPT
- Update the RCT
- Modify CICS startup JCL

These steps are described next.

Rename the CA-Pan/SQL Modules (Optional)

The CA-Pan/SQL modules exist in the interface CICS LOAD library with a prefix of DQSPS. If this naming convention conflicts with existing CICS modules at your site, Computer Associates CA-Easytrieve/ESP and CA-General/OL products let you rename the interface modules.

Since CA-Pan/SQL is a common SQL interface product whose modules are shared by several Computer Associates products, you must follow the instructions for each host product to accommodate the renamed modules.

See the *Getting Started* for each host product for the correct installation procedure for renamed CA-Pan/SQL modules.

Update the CICS PPT

The following entries must be added to your CICS Program Processing Table. These table entries can be found in member CICSPPT of the CA-Pan/SQL source library. If you renamed the CA-Pan/SQL modules, then the program names specified in the PPT entries must be changed to reflect the new names.

```
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCF,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCG,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCV,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXM,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSMELT,PGMLANG=ASSEMBLER
```

Update the RCT

If your site has not implemented dynamic plan allocation, then you must define an RCT entry for each Computer Associates product that is using CA-Pan/SQL in the z/OS or OS/390 /CICS environment. The following is a sample RCT entry:

```
DSNCRCT TYPE=ENTRY,TXID=xxxx,PLAN=DQPS024,AUTH=USERID
```

where *xxxx* is the CICS transaction code of the Computer Associates product.

Note: If you are installing CA-Pan/SQL for a product that runs under CA-Easytrieve/ESP, the RCT entry transaction code is **ESP**. The value for PLAN is the plan name of the SQL interface. This is the name specified for the installation job IJ3STGE1; the default plan name is **DQPS024**.

Most RCT parameters are dependent on your standards and environment.

Note: See the host product *Getting Started* for more information about the RCT entry and additional required entries.

Modify CICS Startup JCL

When the installation of CA-Pan/SQL completes, modify your CICS startup JCL to add the CA-Pan/SQL interface CICS load library (*_your.pansql.cics.load.library_*) to the DFHRPL DD statement.

See the *Getting Started* of the Computer Associates host product for additional changes to the CICS startup JCL.

Installing CA-Pan/SQL for an Alternate DB2 for z/OS and OS/390 Subsystem (Optional)

Member SQLINST4 in the source library contains the JCL to install CA-Pan/SQL in an alternate DB2 for z/OS and OS/390 system. You need to install only the interface catalog views and bind the interface plan. Modify the JCL as described in the following. Where a name is required, specify the same parameter value that you provided for job IJ3STEGE1.

- Modify the JOB statement to conform to your site's standards.
- Provide authorization for the alternate DB2 for z/OS and OS/390 subsystem to the owner ID selected for the views. See Create CA–Pan/SQL Views.
- Provide the name of your CA-Pan/SQL source library that contains DQCTGVWS, the source statements for creating the catalog views.
- Provide the name of your IBM DB2 for z/OS and OS/390 subsystem program library that contains module DSNTIAD.
- Provide the name of your DBRM library that contains the DBRM for the Interface Command Processor created by job IJ3STGE1.
- Provide the alternate DB2 for z/OS and OS/390 subsystem ID (ssid2) for the CTGVIEWS and DB2BIND SYSTSIN statements.
- Provide the name of your IBM DB2 for z/OS and OS/390 run library for both the CTGVIEWS and DB2BIND SYSTSIN statements.
- Provide the name of the interface DBRM that was created by job IJ3STGE1 for the DBRMNAME variable.
- Provide the name of the interface plan that was created by job IJ3STGE1 for the PLANNAME variable. This name **must** be the same plan name specified for the IJ3STGE1 job.

All steps should complete with a condition code **zero**.

Installing CA-Pan/SQL for a Remote SQL System

If you are using CA-Pan/SQL to communicate with SQL running on an OS/2 or AIX system, then you must install the CA-Pan/SQL views defined in member DQCTGVW2 on your alternate SQL system. Member DQCTGVW2 is unloaded from the installation tape to your CA-Pan/SQL installation source library.

You modified source member DQCTGVWS for your z/OS or OS/390 installation, where you changed the owner ID of the views, then you must modify source member DQCTGVW2, changing the owner ID of the views to the same value. No other changes should be made to the views except to change the *ownerid* value.

Remote Binds

If you are installing the CA-Pan/SQL interface on remote SQL systems that communicate with your z/OS or OS/390 system, then you must bind the CA-Pan/SQL DBRM for each remote location.

The following DB2 for z/OS and OS/390 commands can be used as a sample for binding the CA-Pan/SQL DBRM into packages for two remote locations. The two packages, along with the mainframe DBRM, are bound into a single plan on the mainframe.

```
DSN SYSTEM (dsn)
 BIND  PACKAGE(location-1.pansql-package) MEMBER(pansql-dbrm)
-
 ACT(REPLACE) ISOLATION(CS)
 BIND  PACKAGE(location-2.pansql-package) MEMBER(pansql-dbrm)
-
 ACT(REPLACE) ISOLATION(CS)
 BIND PLAN(pansql-plan) PKLIST(location-1.pansql-package.*,
-
                                location-2.pansql-package.*)
-
    MEMBER(pansql-dbrm)
-
    ACT(REPLACE) ISOLATION(CS)
```

Oracle

This section describes how to install the Computer Associates SQL interface option (CA-Pan/SQL) for the Oracle Relational Database in z/OS or OS/390. This CA-Pan/SQL interface was developed using the Oracle "Call Interface," which allows for the execution of dynamic SQL.

The installation procedure transfers CA-Pan/SQL from the installation tape to disk files at your site. You should install CA-Pan/SQL in a separate load library from the Computer Associates product or products using CA-Pan/SQL. You **must** install the CA-Pan/SQL interface for Oracle in a separate library from any other CA-Pan/SQL interface load libraries since all CA-Pan/SQL interface modules are named the same across relational databases. This separate load library must then be supplied in the JCL or TSO STEPLIB required to execute the host product or products. For JCL modifications, see the *Getting Started* for each product.

All CA-Pan/SQL interface modules are link-edited in the load library with a prefix of DQSPS. All modules are re-entrant.

The installation procedure consists of loading a PDS from the installation tape and executing a link-edit job. The CA-Pan/SQL interface for Oracle executes in the TSO and batch environments only.

Installing CA-Pan/SQL for Oracle

The steps to install CA-Pan/SQL for Oracle in z/OS or OS/390 are:

1. Determine DASD requirements for CA-Pan/SQL libraries.
2. Retrieve UNLOAD JCL.
3. Edit and run UNLOAD JCL.
4. Install CA-Pan/SQL for TSO and batch.

Step 1. Determine DASD Requirements for CA-Pan/SQL Libraries

The CA-Pan/SQL installation procedure unloads the installation components to two libraries:

- Source library
- TSO/batch library

Use the following table as a guideline for determining the amount of DASD space required.

Library	Kbs	Directory Blocks
Source	100	5
Load (TSO/batch)	800	5

Step 2. Retrieve UNLOAD JCL

The CA-Pan/SQL installation tape has an external label identifying the operating system as z/OS or OS/390. The files are in IEBCOPY format. Use the following IEBGENER job to retrieve the UNLOAD JCL from FILE01 of the installation tape:

```
//LOAD    EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//SYSUT1   DD DISP=(OLD,KEEP),
//            DSN=CAI.SAMPJCL,
//            UNIT=VTAPE,
//            VOL=SER=250360,
//            LABEL=(9,SL),
//            DCB=DEN=4
//SYSUT2   DD DISP=(NEW,CATLG,DELETE),
//            DSN=your.PANSQL24.SAMPJCL,
//            STORCLAS=TSO,
//            SPACE=(3120,(40,20,10)),
//            DCB=(LRECL=80,BLKSIZE=3120,RECFM=FB)
//SYSUT3   DD UNIT=SYSDA,
//            SPACE=(TRK,(5,5))
//SYSUT4   DD UNIT=SYSDA,
//            SPACE=(TRK,(5,5))
//SYSIN    DD DUMMY
```

Step 3. Edit and Run UNLOAD JCL

Modify the UNLOAD JCL as described in the following.

- Change the JOB statement to conform to your site's standards.
- Provide the volume serial number of the installation product tape or cartridge for the TAPEVOL parameter.
- Specify the device type of the product medium as TAPE or CART for the TAPEUNIT parameter.
- Provide the disk volume serial number where the CA-Pan/SQL product data sets are to be installed for the DISKVOL parameter.
- Specify the disk unit type for the DISKUNIT parameter.
- Modify the space allocation for the two libraries created by step CRTELIB, if necessary. The install JCL reflects DASD allocation for a 3380 disk drive.
- Set the name of the source library in the PSQLSRC parameter.
- Set the name of the TSO/batch load library in the PSQLTSO parameter.

The UNLOAD job allocates the libraries necessary for CA-Pan/SQL installation. Prior to the allocation of the libraries, a SCRATCH step exists that allows you to rerun this job if needed. The remaining steps unload the files from the tape to the libraries specified.

Submit the UNLOAD JCL and review the results. Each step should complete with a condition code of zero.

The UNLOAD job transfer the following files:

File	Library	Member	Description
FILE02	SOURCE	LINKTSO	Control statements to link CA-Pan/SQL for the TSO and batch environment
	SOURCE	SQLINST1	JCL to install CA-Pan/SQL for the TSO and batch environment
FILE03	TSOLOAD	TQSPSxxx	Load modules for the TSO and batch environment

Step 4. Install CA-Pan/SQL for TSO and Batch

To install CA-Pan/SQL for batch:

- Modify and run job SQLINST1
- Modify JCL for host product or TSO logon PROC

Modify and Run Job SQLINST1

Job SQLINST1 (member SQLINST1 of the SOURCE library) installs CA-Pan/SQL for TSO/batch. This job simply executes a link step. Before submitting this job for execution, modify the JCL as described in the following.

- Modify the JOB statement to conform to your site's standards.
- Specify the name of your CA-Pan/SQL TSO/batch load library in the PSQLTSO parameter. This is the name of the TSO/batch library specified in the UNLOAD job.
- Specify the name of the CA-Pan/SQL source library in the PSQLSRC parameter. This library contains the link control statements (member LINKTSO) required for the link step.

- Specify the name of your Oracle SQL library in the OSQLLIB parameter. This library should contain the Oracle Call Interface module HLISTUB.

Submit job SQLINST1 and verify the results. The link step should complete with a condition code of zero.

Modify JCL or TSO Logon Procedure

When the installation of the CA-Pan/SQL interface for Oracle completes, see the *Getting Started* of the Computer Associates product or products using the SQL Oracle interface. Incorporate the CA-Pan/SQL interface Oracle load library and any required Oracle libraries into the product's runtime JCL or user's TSO procedure.

CA-Datacom/DB

This section describes how to install the Computer Associates SQL interface option (CA-Pan/SQL) for CA-Datacom/DB in z/OS or OS/390. This installation procedure transfers CA-Pan/SQL from the installation tape to disk files at your site.

You should install CA-Pan/SQL in a separate load library from the Computer Associates product or products that are using the SQL interface. This CA-Pan/SQL load library must then be supplied in the TSO STEPLIB or JCL that is required to execute the host product or products. For JCL modifications, see the *Getting Started* for each product.

All CA-Pan/SQL interface modules are link-edited in the load library with a prefix of DQSPS. All modules are re-entrant.

The complete installation procedure installs the following components:

- Batch interface
- Default plan options module for batch

- CICS interface
- Default plan options module for CICS

Installing CA-Pan/SQL for CA-Datacom/DB

The steps to install CA-Pan/SQL for CA-Datacom/DB in z/OS or OS/390 are:

1. Retrieve UNLOAD JCL
2. Edit and run UNLOAD JCL
3. Install CA-Pan/SQL for TSO/batch
4. Create default plan options module for TSO/batch (optional)
5. Install CA-Pan/SQL for CICS
6. Create default plan options module for CICS (optional)

Step 1. Retrieve UNLOAD JCL

The CA-Pan/SQL installation tape has an external label identifying the operating system as z/OS or OS/390. The files are in IEBCOPY format. Use the following IEBGENER job to retrieve the UNLOAD JCL from FILE01 of the installation tape:

```
//SQLGENR JOB (acct info),'UNLOAD PAN/SQL JCL',CLASS=x,
//  MSGCLASS=x,MSGLEVEL=(1,1),REGION=2048K
//*************************************************************
//*
//*   STEP1:  UNLOAD PAN/SQL INSTALL JCL
//*
//*************************************************************
//STEP1    EXEC  PGM=IEBGENER
//SYSUT1   DD  DSN=FILE01,DISP=(OLD,KEEP),UNIT=uuuu,
//             LABEL=(1,SL),VOL=SER=ssssss
//SYSUT2   DD
DISP=(NEW,CATLG,DELETE),DSN=pansql.install.unload.jcl,
//             UNIT=SYSDA,SPACE=(TRK,(1,1)),VOL=SER=xxxxx
//SYSUT3   DD  UNIT=SYSDA,SPACE=(TRK,(1,1))
//SYSUT4   DD  UNIT=SYSDA,SPACE=(TRK,(1,1))
//SYSPRINT DD  SYSOUT=*
//SYSIN    DD  DUMMY
//*
```

Step 2. Edit and Run UNLOAD JCL

The UNLOAD job allocates the libraries necessary for CA-Pan/SQL installation. Prior to the allocation of the libraries, a SCRATCH step exists that lets you rerun this job, if necessary. The remaining steps unload the files from the tape to the specified libraries:

- Source library
- TSO/batch load library
- CICS LOAD library

The space allocations for these three libraries are based on a 3380 disk drive.

Before submitting the UNLOAD job for execution, you must modify the JCL as follows:

- Change the JOB statement to conform to your site's standards.
- Provide the volume serial number of the installation product tape or cartridge for the TAPEVOL parameter.
- Specify the device type of the product medium as TAPE or CART for the TAPEUNIT parameter.
- Provide the disk volume serial number where the CA-Pan/SQL product data sets are to be installed for the DISKVOL parameter.
- Specify the disk unit type for the DISKUNIT parameter.
- Set the name of the source library in the PSQLSRC parameter
- Set the name of the TSO/batch load library in the PSQLTSO parameter
- Set the name of the CICS load library in the PSQLCIC parameter.
- Modify the space allocation for the three libraries created by step CRTELIB, if necessary. The install JCL reflects DASD allocation for a 3380 disk drive.

Submit the UNLOAD JCL and review the results. Each step should complete with a condition code of 0.

The UNLOAD job transfers the following files:

File	Library	Member	Description
FILE02	SOURCE	CICSPPT	CICS PPT entries for the CA-Pan/SQL modules
		DQPLNOPT	Macro for generating plan option modules
		LINKCICS	Control statements to link CA-Pan/SQL for the CICS environment
		LINKTSO	Control statements to link CA-Pan/SQL for the TSO and batch environment
		PSQLVRSN	Data control statements identifying the version/release and genlevel of the CA-Pan/SQL interface
		SQLINST1	JCL to install CA-Pan/SQL for the TSO and batch environment
		SQLINST2	Create plan options module for TSO/batch
		SQLINST3	JCL to install CA-Pan/SQL for the CICS environment
		SQLINST4	Create plan options module for CICS
		SQLUNLD	A copy of the UNLOAD JCL from FILE01

File	Library	Member	Description
FILE03	TSOLOAD	TQSPS*xxx*	Load modules for the TSO environment
FILE04	CICSLOAD	TQSPS*xxx*	Load modules for the CICS environment

Step 3. Install CA-Pan/SQL for TSO/Batch

To install CA-Pan/SQL for batch:

- Modify and run SQLINST1
- Modify JCL for host product or TSO logon PROC

Modify and Run SQLINST1

Job SQLINST1, which exists in your CA-Pan/SQL source library, installs CA-Pan/SQL for TSO/batch. This job simply executes a link step.

Before submitting this job for execution, modify the JCL as follows:

1. Modify the JOB statement to conform to your site's standards.
2. Specify the name of your CA-Pan/SQL TSO/batch load library in the PSQLTSO parameter of the PROC statement. This is the name of the TSO/batch library specified for the UNLOAD job.
3. Specify the name of your CA-Pan/SQL source library in the PSQLSRC parameter of the PROC statement. This library contains link-edit control statements (member LINKTSO) required for this link step.

4. Submit job SQLINST1 and verify the results. The link step completes with a condition code of eight due to message:

   ```
   IEW0132 DBMSCBL
   IEW0132 ERROR-SYMBOL PRINTED IS AN UNRESOLVED EXTERNAL
   REFERENCE
   ```

   or

   ```
   IEW2456E SYMBOL DBMSCBL UNRESOLVED
   ```

   depending on your linkage-editor.

5. Depending on your release of z/OS or OS/390, the link-edit of each CA-Pan/SQL module can result in the following warning message, which can be ignored:

```
IEW2651W 511C ESD AMODE 24 CONFLICTS WITH USER SPECIFIED AMODE
ANY FOR ENTRY POINT module-name.
```

Step 4. Create Default Plan Options Module for TSO/Batch

The CA-Pan/SQL interface for CA-Datacom/DB creates a plan for each user application program during the compile or preprocessing phase. All of the SQL statements for the given user program are grouped into a single plan. When a plan is created, certain attributes are defined. These attributes then apply to all SQL statements that are inserted (compiled) into the plan.

The CA-Pan/SQL interface is installed with a default plan options module named DQSMPLN@. A separate default module exists for the CICS environment and batch environment. The attributes of these plan options modules are the default values listed for each option described in the following.

If you want to generate a different set of attributes for your site's default batch plan options module, you can execute the SQLINST2 job, providing a PLANNME of DQSMPLN@.

Job SQLINST4 can be used to create a new plan for the CICS environment.

Before submitting SQLINST2 for execution, you must decide on the attributes of your plan options module. The plan options that you can specify correspond to the CA-Datacom/DB SQL precompiler options. These options are explained in detail in the CA-Datacom/DB *SQL Programming Guide and Reference*.

The following is a brief description of each option.

CBSIO

Specifies an I/O limit interrupt value for all SQL commands that creates a set. This option enables application environments to establish their own maximums in I/O and set processing relative to their own requirements.

Valid entries are 0 - 65535. The value specified is multiplied by 8 by CA-Datacom/DB. The actual maximum value is 524280.

Default value: 1

PRTY

Specifies the priority of the SQL requests from the plan within the Multi-User Facility. The lowest priority is 1; the highest priority is 15. See your database administrator for the correct setting of this parameter.

Default value: 7

WAITMIN and WAITSEC

Specifies the exclusive control wait time limit in minutes (WAITMIN) and seconds (WAITSEC).

This option permits a program to wait or not wait for an explicit amount of time when another job is holding a requested record under exclusive control. If this time is exceeded, the application program receives a -117 value in the SQLCODE of the SQL Communication Area and a CA-Datacom/DB return code of 61 to inform the user that the record was not available.

Specifying a zero-value for both WAITMIN and WAITSEC means that there is no time limit, and without a limit on the wait time, a "wait forever" condition is possible. A zero-value for both WAITMIN and WAITSEC is not valid.

Default value: WAITMIN=0,WAITSEC=1

PLANCLS

Specifies when the plan and user requirements tables are to be closed.

A value of T indicates that the plan and user requirements tables are to be closed when the transaction ends, that is, when an SQL COMMIT WORK, SQL ROLLBACK WORK, or a CA-Datacom/CICS Services DEQUE is executed.

A value of R indicates that the plan and user requirements tables are to be closed when the run unit ends or when a CA-Datacom/DB CLOSE command is issued.

The T option is recommended for the CICS environment and the R option is recommended for the batch environment.

Default value: T for CICS; R for batch

ISOL

Specifies the isolation level or the degree to which a unit of recovery in your application is isolated from the updating operations of other units of recovery.

A value of U (for uncommitted data) indicates no locks are acquired for any rows updated.

A value of C (for cursor stability) indicates that locks are acquired for all rows accessed.

Default value: C

SQLMODE

Specifies the mode in which to process the program.

Valid values are ANSI, FIPS, and DATACOM.

If you specify ANSI or FIPS, then all of your SQL statements must be coded according to ANSI or FIPS standards. Names for tables, columns, views, synonyms, and cursors must be 1 to 18 characters in length.

If you specify DATACOM, your program is processed in extended mode which means CA-Datacom/DB extensions to the standards are permitted in your SQL statements. Names for tables, columns, views, synonyms and cursors can be 1 to 32 characters in length. The CA-Pan/SQL interface currently has a 30-character limit for cursor names.

Default value: DATACOM

PRMSGS and EXMSGS

Specifies the level of messages you want generated by the SQL optimizer at preprocess time and execution time.

Valid values for each category of message follow:

- **D** means detail level messages
- **S** means summary level messages
- **N** means no messages

Default values: PRMSGS=N; EXMSGS=N

OPTMODE

Specifies the join optimization mode.

Valid values are P and M. A value of P specifies normal join optimization. A value of M (manual join order) indicates that you want tables joined as they are listed in the FROM clause of your SQL statement. This results in a nested loop join.

Default value: P

TIME

Specifies the output format for columns of data type TIME.

Valid values follow:

	Output Form	Standard
ISO	hh.mm.ss	International Standards Organization
EUR	hh.mm.ss	IBM European Standard
JIS	hh:mm:ss	Japanese Industrial Standard
USA	hh.mm AM or PM	IBM USA Standard

Default value: The value specified in the Multi-User Facility's TIME Startup Option

DATE

Specifies the output format for columns of data type DATE.

Valid values follow:

	Output Form	Standard
ISO	yyyy-mm-dd	International Standards Organization
EUR	dd.mm.yyyy	IBM European Standard
JIS	yyyy-mm-dd	Japanese Industrial Standard
USA	mm/dd/yyyy	IBM USA Standard

Default Value: the value specified in the Multi-User Facility's DATE Startup Option.

PLANNME

Specifies the name of your plan options module. A valid eight-character load module name must be specified.

Default value: no default

Modify and Run SQLINST2

Before submitting job SQLINST2 for execution, you must make the following JCL modifications:

- Modify the JOB statement to conform to your site's standards.
- Specify the name of *your.pansql.source.library* for the PSQLSRC parameter of the PROC statement. This library was unloaded from the product installation tape and contains the macro DQPLNOPT.
- Specify the name of *your.pansql.tso.load.library* for the PSQLTSO parameter of the PROC statement. This library contains the new link-edited plan options module.
- Specify the name of the new plan options module for the PLANNME parameter of the PROC statement. If you want to create a new default module that is used for all plans, then name the module DQSMPLN@.
- If you want to create a new plan options module that is to override the default module, and the host product that you are running supports this feature, then specify a name other than DQSMPLN@.
- The name you specify for the procedure parameter PLANNME must be the same as the name specified for PLANNME on the DQPLNOPT macro statement.
- Specify the new plan options name for the PLANNME parameter of the DQPLNOPT macro statement of the ASMMACR.SYSIN DD statement.

Submit job SQLINST2. Verify the output for any macro or assembly errors.

Step 5. Install CA-Pan/SQL for CICS

To install CA-Pan/SQL for CICS:

- Modify and run SQLINST3.
- Rename the CA-Pan/SQL modules (optional).
- Update PPT.
- Modify CICS startup JCL.

Modify and Run SQLINST3

Job SQLINST3, which exists in your CA-Pan/SQL source library, installs CA-Pan/SQL for CICS. This job simply executes a link step.

Before submitting this job for execution, modify the JCL as follows:

- Modify the JOB statement to conform to your site's standards.
- Specify the name of your CA-Pan/SQL CICS load library in the PSQLCIC parameter of the PROC statement. This is the name of the CICS library specified for the UNLOAD job.
- Specify the name of your CA-Pan/SQL source library in the PSQLSRC parameter of the PROC statement. This library contains the link control statements (member LINKCICS) required for this link step.
- Specify the name of your IBM CICS load library that contains module DFHEAI0 for the CICSLOAD parameter of the PROC statement.

Submit job SQLINST3 and verify the results. The link step should complete with a condition code of 0.

Rename the CA-Pan/SQL Modules (Optional)

The CA-Pan/SQL modules exist in the interface CICS load library with a prefix of DQSPS. If this naming convention conflicts with existing CICS modules at your site, the Computer Associates CA-Easytrieve/ESP and CA-General/OL products permit you to rename the interface modules.

Since CA-Pan/SQL is a common SQL interface product whose modules are shared by several Computer Associates products, you must follow the instructions for each host product to accommodate the renamed modules.

See the *Getting Started* for each host product as to the correct installation procedure for renamed CA-Pan/SQL modules.

Update the CICS PPT

The following entries must be added to your CICS Program Processing Table. These table entries can be found in member CICSPPT of the CA-Pan/SQL source library. If you renamed the CA-Pan/SQL modules, then the program names specified in the PPT entries must be changed to reflect the new names.

```
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCF,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCG,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCV,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXM,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXR,PGMLAND=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSMELT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSMPLN@,PGMLANG=ASSEMBLER
```

Note: If you create a new plan options module for CICS, then you must add a PPT entry for it.

It is assumed that you have a functioning SQL Option installed for your CA-Datacom/DB in your CICS region. If not, see your CA-Datacom/DB manuals for the proper installation and verification of the SQL Option. CA-Pan/SQL should not be used to verify your CA-Datacom/DB SQL option.

Modify CICS Startup JCL

When the installation of CA-Pan/SQL completes, modify your CICS startup JCL to include the CA-Pan/SQL interface CICS load library (*your.pansql.cics.load.library*).

See the *Getting Started* of the Computer Associates host product for additional changes to the CICS startup JCL.

Step 6. Create Default Plan Options Module for CICS

Installation job SQLINST4 can be used to create a new plan options module or change the attributes of default plan options module DQSMPLN@ for the CICS environment.

Before submitting SQLINST4 for execution, you must decide on the attributes of your plan options module for the CICS. These options are explained in the SQLINST2 portion of the installation.

Modify and Run SQLINST4

Before submitting Job SQLINST4 for execution, you must make the following JCL modifications:

- Modify the JOB statement to conform to your site's standards.
- Specify the name of *your.pansql.source.library* for the PSQLSRC parameter of the PROC statement. This library was unloaded from the product installation tape and contains the macro DQPLNOPT.

- Specify the name of *your.pansql.cics.load.library* for the PSQLCIC parameter of the PROC statement. This library contains the new link-edited plan options module.
- Specify the name of the new plan options module for the PLANNME parameter of the PROC statement. If you want to create a new default module that is used for all plans, then name the module DQSMPLN@.
- If you want to create a new plan options module that is to override the default module, and the host product that you are running supports this feature, then specify a name other than DQSMPLN@.
- The name you specify for the procedure parameter PLANNME must be the same as the name specified for PLANNME on the DQPLNOPT macro statement.
- Specify the new plan options name for the PLANNME parameter of the DQPLNOPT macro statement of the ASMMACR.SYSIN DD statement.
- Submit job SQLINST4. Verify the output for any macro or assembly errors.
- If you are creating a new plan options module with a name other than DQSMPLN@, then you must add the new name to the CICS PPT.

CA-IDMS with SQL

This section describes how to install the Computer Associates SQL interface option (CA-Pan/SQL) for CA-IDMS with SQL in z/OS or OS/390. This installation procedure transfers CA-Pan/SQL from the installation tape to disk files at your site.

You should install CA-Pan/SQL in a separate load library from the Computer Associates product or products that are using the SQL interface. This CA-Pan/SQL load library must then be supplied in the TSO STEPLIB or JCL that is required to execute the host product or products. For JCL modifications, see the *Getting Started* for each product.

All CA-Pan/SQL interface modules are link-edited in the load library with a prefix of DQSPS. All modules are re-entrant.

The complete installation procedure installs the following components:

- Batch interface
- CICS interface

Installing CA-Pan/SQL for CA-IDMS with SQL

The steps to install CA-Pan/SQL for CA-IDMS with SQL in z/OS or OS/390 are:

1. Retrieve UNLOAD JCL
2. Edit and run UNLOAD JCL
3. Install CA-Pan/SQL for TSO/batch
4. Install CA-Pan/SQL for CICS

Step 1. Retrieve UNLOAD JCL

The CA-Pan/SQL installation tape has an external label identifying the operating system as z/OS and OS/390. The files are in IEBCOPY format. Use the following IEBGENER job to retrieve the UNLOAD JCL from FILE01 of the installation tape:

```
//SQLGENR JOB (acct info),'UNLOAD PAN/SQL JCL',CLASS=x,
//  MSGCLASS=x,MSGLEVEL=(1,1),REGION=2048K
//*************************************************************
//*
//*   STEP1:  UNLOAD PAN/SQL INSTALL JCL
//*
//*************************************************************
//STEP1    EXEC  PGM=IEBGENER
//SYSUT1   DD  DSN=FILE01,DISP=(OLD,KEEP),UNIT=uuuu,
//             LABEL=(1,SL),VOL=SER=ssssss
//SYSUT2   DD
DISP=(NEW,CATLG,DELETE),DSN=pansql.install.unload.jcl,
//             UNIT=SYSDA,SPACE=(TRK,(1,1)),VOL=SER=xxxxx
//SYSUT3   DD  UNIT=SYSDA,SPACE=(TRK,(1,1))
//SYSUT4   DD  UNIT=SYSDA,SPACE=(TRK,(1,1))
//SYSPRINT DD  SYSOUT=*
```

```
//SYSIN    DD  DUMMY
//*
```

Step 2. Edit and Run UNLOAD JCL

The UNLOAD job allocates the libraries necessary for CA-Pan/SQL installation. Prior to the allocation of the libraries, a SCRATCH step exists that lets you rerun this job, if necessary. The remaining steps unload the files from the tape to the specified libraries:

- Source library
- Object library
- TSO/batch load library
- CICS load library

The space allocations for these libraries are based on a 3380 disk drive.

Before submitting the UNLOAD job for execution, you must modify the JCL as follows:

- Change the JOB statement to conform to your site's standards.
- Provide the volume serial number of the installation product tape or cartridge for the TAPEVOL parameter.
- Specify the device type of the product medium as TAPE or CART for the TAPEUNIT parameter of the PROC statement.
- Provide the disk volume serial number where the CA-Pan/SQL product data sets are to be installed for the DISKVOL parameter.
- Specify the disk unit type for the DISKUNIT parameter.
- Set the name of the source library in the PSQLSRC parameter.
- Set the name of the object library in the PSQLOBJ parameter.
- Set the name of the TSO/batch load library in the PSQLTSO parameter.

- Set the name of the CICS load library in the PSQLCIC parameter.
- Modify the space allocation for the libraries created by step CRTELIB, if necessary. The install JCL reflects DASD allocation for a 3380 disk drive.

Submit the UNLOAD JCL and review the results. Each step should complete with a condition code of 0.

The UNLOAD job transfers the following files:

File	Library	Member	Description
FILE02	SOURCE	CICSPPT	CICS PPT entries for the CA-Pan/SQL modules
		LINKCICS	Control statements to link CA-Pan/SQL for the CICS environment
		LINKTSO	Control statements to link CA-Pan/SQL for the TSO and batch environment
		PSQLVRSN	Data control statements identifying the version/release and genlevel of the CA-Pan/SQL interface
		SQLINST1	JCL to install CA-Pan/SQL for the TSO and batch environment
		SQLINST2	JCL to install CA-Pan/SQL for the CICS environment
		SQLUNLD	A copy of the UNLOAD JCL from FILE01

File	Library	Member	Description
FILE03	OBJECT	OMSCMD05	Object deck for Interface Command Processor defined to support 3 non-cursor statements and 5 cursors
		OMSCMD10	Object deck for Interface Command Processor defined to support 6 non-cursor statements and 10 cursors
		OMSCMD20	Object deck for Interface Command Processor defined to support 12 non-cursor statements and 20 cursors
		OMSCMD30	Object deck for Interface Command Processor defined to support 18 non-cursor statements and 30 cursors
		OMSCMD50	Object deck for Interface Command Processor defined to support 14 non-cursor statements and 50 cursors
		OMSCMD63	Object deck for Interface Command Processor defined to support 1 non-cursor statement and 63 cursors
FILE04	TSOLOAD	TQSPS*xxx*	Load modules for the TSO and batch environment
FILE05	CICSLOAD	TQSPS*xxx*	Load modules for the CICS environment

Step 3. Install CA-Pan/SQL for TSO/Batch

This section details the procedure for installing CA-Pan/SQL for TSO/Batch.

SQLINST1

To install CA-Pan/SQL for batch:

- Modify link control statements for TSO/batch
- Modify and run SQLINST1
- Modify JCL for host product or TSO l logon PROC

Modify Link Control Statements for TSO/Batch

The installation object library contains several object members named OMSCMD*xx*, which are various versions of the Interface Command Processor.

The Interface Command Processor module contains the static SQL statements needed for processing your application SQL program for the CA-IDMS SQL database. Several versions of this program exist in your object library. See the following list for the object modules and the statements they support.

For example, module OMSCMD10 contains the necessary statements to support the processing of a maximum of 10 cursors and 6 non-cursor statements. Cursor statements are the DECLARE cursor statements; non-cursor statements are the INSERT, DELETE, and UPDATE statements. The module is limited to the processing of 10 cursors, but it is really not limited to 6 non-cursor statements. Non-cursor statements can be reused by the interface, but cursor statements cannot. You must choose a Command Processor module that suits the processing requirements of your site.

The Command Processor is limited to a maximum of 64 statements (that is, a combination of cursor and non-cursor statements).

The installation source library contains member LINKTSO, which consists of the link control statements for linking the CA-Pan/SQL interface modules for the TSO and batch environment. Before submitting job SQLINST1 for execution, you must modify the link control statements to incorporate the required Command Processor object deck. The default used by the link control statements is member OMSCMD10. If you need a different module, you must change this control statement to reflect the correct module. Otherwise, you can use the link control statements as they are.

Listed in the following are the link control statements for the TSO/batch environment. The INCLUDE for member OMSCMD10 can be modified but not removed. Be sure to change the name in all occurrences.

```
(Source member LINKTSO)
INCLUDE OBJLIB(OMSCMD10)          (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSCC)
ENTRY DQSPSCC
NAME DQSPSCC(R)
INCLUDE SYSLMOD(TQSPSCF)
ENTRY DQSPSCF
NAME DQSPSCF(R)
INCLUDE OBJLIB(OMSCMD10)           (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSCG)
ENTRY DQSPSCG
NAME DQSPSCG(R)
INCLUDE OBJLIB(OMSCMD10)           (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSCI)
ENTRY DQSPSCI
NAME DQSPSCI(R)
INCLUDE SYSLMOD(TQSPSCR)
ENTRY DQSPSCR
NAME DQSPSCR(R)
INCLUDE OBJLIB(OMSCMD10)           (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSCS)
ENTRY DQSPSCS
NAME DQSPSCS(R)
INCLUDE OBJLIB(OMSCMD10)           (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSCT)
ENTRY DQSPSCT
NAME DQSPSCT(R)
INCLUDE OBJLIB(OMSCMD10)           (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSXC)
ENTRY DQSPSXC
```

```
NAME DQSPSXC(R)
INCLUDE OBJLIB(OMSCMD10)           (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSXI)
ENTRY DQSPSXI
NAME DQSPSXI(R)
INCLUDE SYSLMOD(TQSPSXM)
ENTRY DQSPSXM
NAME DQSPSXM(R)
INCLUDE OBJLIB(OMSCMD10)           (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSXR)
ENTRY DQSPSXR
NAME DQSPSXR(R)
INCLUDE OBJLIB(OMSCMD10)           (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSXS)
ENTRY DQSPSXS
NAME DQSPSXS(R)
INCLUDE OBJLIB(OMSCMD10)           (member name can be modified)
INCLUDE IDMSLIB(IDMS)
INCLUDE SYSLMOD(TQSPSXT)
ENTRY DQSPSXT
NAME DQSPSXT(R)
INCLUDE SYSLMOD(TQSMELT)
ENTRY DQSMELT
NAME DQSMELT(R)
```

Modify and Run SQLINST1

Job SQLINST1, which exists in your CA-Pan/SQL source library, installs CA-Pan/SQL for TSO/batch. This job simply executes a link step.

Before submitting this job for execution, modify the JCL as follows:

- Modify the JOB statement to conform to your site's standards.
- Specify the name of your CA-Pan/SQL TSO/batch load library in the PSQLTSO parameter of the PROC statement. This is the name of the TSO/batch library specified for the UNLOAD job.
- Specify the name of your CA-Pan/SQL source library in the PSQLSRC parameter of the PROC statement. This library contains the link-edit control statements (member LINKTSO) required for this link step.

- Specify the name of your CA-Pan/SQL object library in the PSQLOBJ parameter of the PROC statement. This library contains the various versions of the Interface Command Processors.
- Specify the name of your CA-IDMS load library for the IDMSLIB parameter. This library contains module IDMS.
- Submit job SQLINST1 and verify the results. The link step should complete with a condition code of 0. Depending on your release of z/OS or OS/390, the link-edit of each CA-Pan/SQL module can result in the following warning message, which can be ignored:

```
IEW2651W 511C ESD AMODE 24 CONFLICTS WITH USER SPECIFIED
AMODE ANY FOR ENTRY POINT module-name
```

Step 4. Install CA-Pan/SQL for CICS

This section details the installation procedure for CA-Pan/SQL for CICS.

SQLINST2

To install CA-Pan/SQL for CICS:

- Modify link control statements for CICS
- Modify and run SQLINST2
- Rename the CA-Pan/SQL modules (optional)
- Update PPT
- Modify CICS startup JCL

Modify Link Control Statements for CICS

As stated in the explanation of Modify Link Control Statements for TSO/Batch, the same modifications are valid for the CICS environment. Listed in the following are the link control statements for the CICS environment. If you must choose a different member for the Interface Command Processor, change the name for all occurrences.

```
(Source member LINKCICS)
\\INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE OBJLIB(OMSCMD10)          (member name may be modified)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSCC)
ORDER DFHEAI,DQSPSCC
NAME DQSPSCC(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE SYSLMOD(TQSPSCF)
ORDER DFHEAI,DQSPSCF
NAME DQSPSCF(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE OBJLIB(OMSCMD10)           (member name may be modified)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSCG)
ORDER DFHEAI,DQSPSCG
NAME DQSPSCG(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE OBJLIB(OMSCMD10)           (member name may be modified)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSCI)
ORDER DFHEAI,DQSPSCI
NAME DQSPSCI(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSCR)
ORDER DFHEAI,DQSPSCR
NAME DQSPSCR(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)           (member name may be modified)
INCLUDE OBJLIB(OMSCMD10)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSCS)
ORDER DFHEAI,DQSPSCS
NAME DQSPSCS(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE OBJLIB(OMSCMD10)           (member name may be modified)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSCT)
```

```
ORDER DFHEAI,DQSPSCT
NAME DQSPSCT(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE OBJLIB(OMSCMD10)            (member name may be modified)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSXC)
ORDER DFHEAI,DQSPSXC
NAME DQSPSXC(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)            (member name may be modified)
INCLUDE SYSLMOD(TQSPSXM)
ORDER DFHEAI,DQSPSXM
NAME DQSPSXM(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE OBJLIB(OMSCMD10)            (member name may be modified)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSXI)
ORDER DFHEAI,DQSPSXI
NAME DQSPSXI(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE OBJLIB(OMSCMD10)            (member name may be modified)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSXR)
ORDER DFHEAI,DQSPSXR
NAME DQSPSXR(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE OBJLIB(OMSCMD10)            (member name may be modified)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSXS)
ORDER DFHEAI,DQSPSXS
NAME DQSPSXS(R)
INCLUDE CICSLIB(DFHEAI)
INCLUDE CICSLIB(DFHEAI0)
INCLUDE OBJLIB(OMSCMD10)            (member name may be modified)
INCLUDE IDMSLIB(IDMSCINT)
INCLUDE SYSLMOD(TQSPSXT)
ORDER DFHEAI,DQSPSXT
NAME DQSPSXT(R)
INCLUDE SYSLMOD(TQSMELT)
ENTRY DQSMELT
NAME DQSMELT(R)
```

Modify and Run SQLINST2

Job SQLINST2, which exists in your CA-Pan/SQL source library, installs CA-Pan/SQL for CICS. This job simply executes a link step.

Before submitting this job for execution, modify the JCL as follows:

- Modify the JOB statement to conform to your site's standards.
- Specify the name of your CA-Pan/SQL CICS load library in the PSQLCIC parameter of the PROC statement. This is the name of the CICS library specified for the UNLOAD job.
- Specify the name of your CA-Pan/SQL source library in the PSQLSRC parameter of the PROC statement. This library contains the link control statements (member LINKCICS) required for this link step.
- Specify the name of the object library in the PSQLOBJ parameter.
- Specify the name of your IBM CICS load library that contains module DFHEAI0 for the CICSLOAD parameter of the PROC statement.
- Specify the name of your CA-IDMS load library for the IDMSLIB parameter. This library contains module IDMSCINT.

Submit job SQLINST2 and verify the results. The link step should complete with a condition code of zero.

Rename the CA-Pan/SQL Modules (Optional)

The CA-Pan/SQL modules exist in the interface CICS load library with a prefix of DQSPS. If this naming convention conflicts with existing CICS modules at your site, the Computer Associates CA-Easytrieve/ESP and CA-General/OL products allow for the interface modules to be renamed.

Since CA-Pan/SQL is a common SQL interface product whose modules are shared by several Computer Associates products, you must follow the instructions for each host product to accommodate the renamed modules.

See the *Getting Started* for each host product as to the correct installation procedure for renamed CA-Pan/SQL modules.

Update the CICS PPT

The following entries must be added to your CICS Program Processing Table. These table entries can be found in member CICSPPT of the CA-Pan/SQL source library. If you renamed the CA-Pan/SQL modules, then the program names specified in the PPT entries must be changed to reflect the new names.

```
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCF,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCG,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCV,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXM,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXR,PGMLAND=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSMELT,PGMLANG=ASSEMBLER
```

Note: We assume that you have a functioning SQL option installed for your CA-IDMS in your CICS region. If not, see your CA-IDMS manuals for the proper installation and verification of the SQL option. CA-Pan/SQL should not be used to verify your CA-IDMS SQL option.

Modify CICS Startup JCL

When the installation of CA-Pan/SQL completes, modify your CICS startup JCL to include the CA-Pan/SQL interface CICS load library (*your.pansql.cics.load.library*).

See the *Getting Started* of the Computer Associates host product for additional changes to the CICS startup JCL.

Chapter

4

VSE Installation

This chapter describes how to install CA-Pan/SQL for each SQL database management system it supports in the VSE environment:

- DB2 Server for VSE
- CA-Datacom/DB (VSE)
- CA-IDMS with SQL (VSE)

DB2 Server for VSE

This chapter describes how to install the Computer Associates SQL interface option (CA-Pan/SQL) in VSE. The installation procedure transfers CA-Pan/SQL from the installation tape to disk files at your site.

You should install CA-Pan/SQL in a separate phase library from the Computer Associates product or products using CA-Pan/SQL. This separate phase library must then be supplied in the JCL required to execute the host product or products. For JCL modifications, see the *Getting Started* for each host product.

All CA-Pan/SQL interface modules are link-edited in the phase library with a prefix of **DQSPS**. All modules are re-entrant.

The complete installation procedure installs the following components:

- CA-Pan/SQL Message Extract Program
- CA-Pan/SQL Views
- CA-Pan/SQL Interface Command Processor
- Interface for batch
- Interface for CICS

These components are described on the following pages.

CA-Pan/SQL Message Extract Program

The IBM DB2 Server for VSE system help tables contain the error messages associated with SQL error codes. CA-Pan/SQL installation requires preprocessing of **DQSMMTB**, the module that extracts the error messages from the IBM DB2 Server for VSE tables. DQSMMTB builds a module that is link-edited with both the batch and CICS versions of CA-Pan/SQL.

CA-Pan/SQL Views

CA-Pan/SQL uses *views* to obtain data from the DB2 Server for VSE system catalogs. Authorization can then be granted on the views rather than on the system catalog tables.

CA-Pan/SQL Interface Command Processor

CA-Pan/SQL module DQSMCMD is referred to as the *Interface Command Processor*. CA-Pan/SQL installation requires that this module be preprocessed and assembled at your site. The source code for DQSMCMD is distributed with CA-Pan/SQL. Assembly of the Command Processor creates an object deck that is link-edited with both the batch and CICS versions of CA-Pan/SQL.

Batch Interface

CA-Pan/SQL installation for batch consists of a link-edit step. This link-edit includes the object deck produced by the assembly of the Interface Command Processor and the message table.

CICS Interface

CA-Pan/SQL installation for CICS consists of a link-edit step and updating of the CICS tables. The link-edit includes the object decks produced by assembly of the Interface Command Processor and the message table.

Installing CA-Pan/SQL for DB2 Server for VSE

The steps to install CA-Pan/SQL for DB2 Server for VSE are to:

1. Determine DASD requirements for CA-Pan/SQL libraries.
2. Retrieve installation files from the tape.
3. Edit and run RESTORE JCL.
4. Install CA-Pan/SQL message extract program.
5. Install CA-Pan/SQL views.
6. Install CA-Pan/SQL Interface Command Processor.
7. Modify and run installation JCL.
8. Install CA-Pan/SQL for batch.
9. Install CA-Pan/SQL for CICS.

Step 1. Determine DASD Requirements for CA-Pan/SQL Libraries

CA-Pan/SQL installation restores the interface components to three sublibraries: a **common** source and object library, a **batch** phase and object library, and a **CICS** phase and object library. You must define separate phase and object libraries for batch and CICS because the interface modules are identically named in both environments.

Use the following table to determine the DASD space required libraries and work data sets.

Library	KBs
Common source and object	250
Batch phase and object	1600
CICS phase and object	1600
Work space	4000

Approximately seventy-five 3380 tracks are required for libraries and eighty-five tracks required for work data sets.

Step 2. Retrieve Installation Files from the Tape

Retrieve the first four files from the installation tape. These files contain the JCL to install CA-Pan/SQL for VSE batch and CICS.

File	Block Size	Description
01	80	Executes the Librarian RESTORE command to create the CA-Pan/SQL library and load the sublibraries
01	80	JCL to install the message extract program, Interface Command Processor, and interface catalog views
03	80	JCL to install CA-Pan/SQL for batch

File	Block Size	Description
04	80	JCL to install CA-Pan/SQL for CICS

Step 3. Edit and Run RESTORE JCL

Retrieve the JCL in FILE01 of the tape, and modify the JCL as shown in the following.

- Change the JOB statement to conform to your site's standards.
- Set the file ID of *your.sql.interface.library* for the SQLLIB DLBL.
- Change the VOLSER on the EXTENT statement to point to the correct volume.
- Provide a name for the sublibrary that is to contain the common source and object for SQLLIB.common.
- Provide a name for the sublibrary that is to contain the interface batch object and phase modules for SQLLIB.batch.
- Provide a name for the sublibrary that is to contain the interface CICS object and phase modules for SQLLIB.cics.
- Change *ttt* on the ASSGN statement to the tape unit number for your installation.
- Provide a valid EOJ statement.

Submit the RESTORE JCL and review the results. The following files and libraries should now exist at your site:

File	Sublibrary	Member	Description
01		SQLRSTR	JCL to restore the CA-Pan/SQL libraries
02		SQLINST1	JCL to install message extract program, CA-Pan/SQL views and Interface Command Processor
03		SQLINST2	JCL to install CA-Pan/SQL for batch
04		SQLINST3	JCL to install CA-Pan/SQL for CICS
05	COMMON	DQCTGVWS	Create catalog view statements
		DQSMMTB	Interface message extract program for DB2 Server for VSE Version 2.1 or lower. This program supports uppercase English message text.
		DQSMMTB3	Interface message extract program for DB2 Server for VSE Version 2.2 or greater. This program supports the American mixed case message text, **langkey='S001'**.
		DQSMCMD	Interface Command Processor Program for DB2 Server for VSE Version 1 or 2
		DQSMCMD3	Interface Command Processor Program for DB2

File	Sublibrary	Member	Description
			Server for VSE Version 3
		LNKV*xx*	Control statements to link interface for batch
		LNKS*xx*	Control statements to link interface for CICS
		CICSPPT	CICS PPT entries for the CA-Pan/SQL modules
		PSQLVRSN	Data control statement identifying the version, release, and genlevel of CA-Pan/SQL
06	BATCH	OMS*xxxxx*	Object modules for batch
07	CICS	OMS*xxxxx*	Object modules for CICS

Step 4. Install Message Extract Program

Job SQLINST1 in FILE02 installs the message extract program, the interface catalog views, and the Interface Command Processor.

The source code for the message extract program is distributed with CA-Pan/SQL and transferred to your SQLLIB.*common* sublibrary as DQSMMTB*x*, where common specifies the name of your common sublibrary and *x* specifies the various versions of the source program.

This module contains the SQL statements that retrieve the text data from the IBM SQLDBA.SYSTEXT2 help table that is associated with DB2 Server for VSE error codes.

Currently, two versions of the source program are specific to the DB2 Server for VSE version and release installed at your site.

Source member DQSMMTB must be installed if your site has DB2 Server for VSE version 2.1 or lower. Source member DQSMMTB3 must be installed if your site has DB2 Server for VSE version 2.2 or greater. The appropriate source member name must be specified in the installation job SQLINST1 step PREMTB.

Note: The CA-Pan/SQL message extract programs support only the English language.

Before SQLINST1 can be submitted for execution, you must do the following:

- Verify that the IBM DB2 Server for VSE help tables are installed.
- Provide the help table name-to-message extract program DQSMMTB.
- Supply password for the SQLDBA user ID for the CONNECT statement of message extract program DQSMMTB.

These tasks are described next.

Verify Installation of Help Tables

CA-Pan/SQL reports the SQL errors that a user can encounter during edit/compile or execution phase processing. CA-Pan/SQL obtains the error message text from the IBM DB2 Server for VSE help tables. Before you can install CA-Pan/SQL, you must verify that these help tables are installed. The tables are:

- SQLDBA.SYSTEXT1
- SQLDBA.SYSTEXT2

To verify the installation of these help tables, enter **help** followed by an SQL error code in an ISQL session. For example, enter:

```
help -101
```

for verification similar to the following:

```
TOPIC NAME:  -101

-101  SQL COMMAND EXCEEDS 8192 POSITIONS OR AN INTERNAL
LIMITATION OF THE SYSTEM. SEPARATE SQL COMMAND INTO SMALLER
COMMANDS.
```

See IBM's *SQL/Data System Planning and Administration for VSE* for a description of the help tables.

Provide the Help Table Name

Because DQSMMTB*x* contains the SQL statements to select data from the help text table, the message extract program explicitly references the table by the name of SQLDBA.SYSTEXT2. If the IBM help table is installed with a name other than SQLDBA.SYSTEXT2, then you must modify the source code for module DQSMMTB*x* to reflect the correct table name.

The table name is located at approximately line 114 in the source code:

```
*************************************************************
MESSAGE   DS   0H
        EXEC SQL                                             X
        DECLARE C1 CURSOR FOR                                X
              SELECT ITEM, "SQL/DS HELP"                     X
              FROM  SQLDBA.SYSTEXT2                          X
              WHERE ITEM >= :WKITEM
*************************************************************
```

Supply User ID and Password

DQSMMTB*x* must also contain the SQL CONNECT statement. DQSMMTB*x* uses a user ID of SQLDBA and a password of SQLDBAPW when executing the CONNECT statement. Job SQLINST1 also uses a user ID and password of SQLDBA and SQLDBAPW for all preprocess steps. To install DQSMMTBx, you must do one of the following:

- Supply the correct password for the SQLDBA user ID in the DQSMMTBx source code and the installation JCL for job SQLINST1

- Temporarily change the password for the SQLDBA user ID to SQLDBAPW for the duration of the CA-Pan/SQL installation. This eliminates the necessity of source code modifications and reduces the number of JCL modifications.

Through either method, the user ID and password provided for the CONNECT statement variables in DQSMMTB*x* must be the same as the user ID and password specified in the JCL for PREMTB.

The source statements containing the user ID and password for the CONNECT statement are located at approximately lines 573 and 574 in source member DQSMMTB, and lines 1021 and 1022 in source member DQSMMTB3:

```
         EXEC SQL BEGIN DECLARE SECTION
CPYWRGHT DC     H'30000'
CMDITEM  DC     H'19099'
CMDSEQNO DC     H'0'
WKITEM   DC     H'19099'
ITEM205  DC     H'20205'
USERID   DC     CL8'SQLDBA  '
PASSWORD DC     CL8'SQLDBAPW'
         DC     C'CMDMSG'
CMDMSTXT DC     CL60' '
         EXEC SQL END DECLARE SECTION
```

Step 5. Install the CA-Pan/SQL Views

Step CTGVIEWS of job SQLINST1 creates the **views** that are used by CA-Pan/SQL. Source member DQCTGVWS contains the SQL statements to create these views.

The owner ID of the views is SQLDBA. Because the Interface Command Processor module **must** be preprocessed with an owner ID of SQLDBA, the owner ID of the views named in the Interface Command Processor defaults to SQLDBA. Therefore, the CREATE VIEW statements must **not** be modified.

The SQL statements to create the interface catalog views are shown in the following. The first statement is a CONNECT statement. You may need to modify the password for the SQLDBA user ID on the CONNECT statement.

```
CONNECT SQLDBA IDENTIFIED BY SQLDBAPW;
DROP   VIEW SQLDBA.DQUSERID;
SET ERRORMODE OFF;
DROP   VIEW SQLDBA.DQTBLECOLS;
SET ERRORMODE OFF;
DROP   VIEW SQLDBA.DQUSERTPRV;
SET ERRORMODE OFF;
DROP   VIEW SQLDBA.DQSYNONYMS;
SET ERRORMODE OFF;
CREATE VIEW SQLDBA.DQUSERID
   (USERID)
AS SELECT
   SQLDBA.SYSUSERLIST.NAME
FROM
   SQLDBA.SYSUSERLIST;
CREATE VIEW SQLDBA.DQTBLECOLS
   (TBLOWNER,
   TBLNAME,
   COLNAME,
   DATATYPE,
   UNIQUEVALUES,
   COLPOS,
   DATALEN,
   SYSLENGTH,
   NULLS,
   LABEL)
AS SELECT
   SYSTEM.SYSCOLUMNS.CREATOR,
   SYSTEM.SYSCOLUMNS.TNAME,
   SYSTEM.SYSCOLUMNS.CNAME,
   SYSTEM.SYSCOLUMNS.COLTYPE,
   SYSTEM.SYSCOLUMNS.COLCOUNT,
   SYSTEM.SYSCOLUMNS.COLNO,
   SYSTEM.SYSCOLUMNS.LENGTH,
   SYSTEM.SYSCOLUMNS.SYSLENGTH,
   SYSTEM.SYSCOLUMNS.NULLS,
   SYSTEM,SYSCOLMNS.LABEL
 FROM
   SYSTEM.SYSCOLUMNS;
CREATE VIEW SQLDBA.DQUSERTPRV
   (GRANTEE,
   TBLOWNER,
   TBLNAME,
   GRANTOR,
   UPDATECOLS,
   SELECTPRIV,
   INSERTPRIV,
   DELETEPRIV,
   UPDATEPRIV,
   TBLTYPE,
   TBLDESCR)
AS SELECT
   SYSTEM.SYSTABAUTH.GRANTEE,
   SYSTEM.SYSTABAUTH.TCREATOR,
   SYSTEM.SYSTABAUTH.TTNAME,
   SYSTEM.SYSTABAUTH.GRANTOR,
   SYSTEM.SYSTABAUTH.UPDATECOLS,
```

```
                SYSTEM.SYSTABAUTH.SELECTAUTH,
                SYSTEM.SYSTABAUTH.INSERTAUTH,
                SYSTEM.SYSTABAUTH.DELETEAUTH,
                SYSTEM.SYSTABAUTH.UPDATEAUTH,
                SYSTEM.SYSCATALOG.TABLETYPE,
                SYSTEM.SYSCATALOG.REMARKS
              FROM
                SYSTEM.SYSTABAUTH,
                SYSTEM.SYSCATALOG
             WHERE
                SYSTEM.SYSTABAUTH.TCREATOR =
SYSTEM.SYSCATALOG.CREATOR AND
SYSTEM.SYSTABAUTH.TTNAME   = SYSTEM.SYSCATALOG.TNAME;
          CREATE VIEW SQLDBA.DQSYNONYMS
              (USERID,
               ALTNAME,
               TBLOWNER,
               TBLNAME)
          AS SELECT
               SYSTEM.SYSSYNONYMS.USERID,
               SYSTEM.SYSSYNONYMS.ALTNAME,
               SYSTEM.SYSSYNONYMS.CREATOR,
               SYSTEM.SYSSYNONYMS.TNAME
          FROM
               SYSTEM.SYSSYNONYMS;
          GRANT SELECT ON SQLDBA.DQUSERID TO PUBLIC;
          GRANT SELECT ON SQLDBA.DQTBLECOLS TO PUBLIC;
          GRANT SELECT ON SQLDBA.DQUSERTPRV TO PUBLIC
```

Step 6: Install CA-Pan/SQL Interface Command Processor

The source code for the Interface Command Processor is distributed with CA-Pan/SQL as source member DQSMCMD*x*, where *x* indicates the various versions of the program.

Currently, two versions of the source program are specific to the DB2 Server for VSE version and release installed at your site. Source member DQSMCMD3 must be installed if your site is running DB2 Server for VSE version 3.0 or greater. Otherwise, source member DQSMCMD must be installed. The appropriate source member name must be specified in the installation job SQLCMD, step PRECMD.

The source code must not be modified in any way. Assembly of the Command Processor creates an object deck, which is link-edited with both the batch and CICS interface modules.

Step 7. Modify and Run SQLINST1

Job SQLINST1 creates two object modules that are cataloged in the common sublibrary. These object decks are link-edited with both the batch and CICS versions of CA-Pan/SQL.

Before submitting job SQLINST1, you must make the JCL modifications in the following.

JOB SQLINST1

1. Change the JOB statement to conform to your site's standards. Job SQLINST1 contains three JOB statements. All three jobs must be executed in the same partition and require the successful completion of the previous job step.
2. In step PREMTB (which preprocesses the message extract program):
   - Change the SQLLIB DLBL, EXTENT, and LIBDEF statements to reference *your.sql.interface.library* and common sublibrary. The SQLLIB library was created as part of the initial RESTORE job.
   - Change the IBMLIB DLBL, EXTENT, and LIBDEF statements to reference the library containing the program ARIPRPA.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSPH and SYSPCH statements to identify an output disk data set. The size of the file has to be able to hold 2000 KB bytes, approximately thirty-five 3380 tracks.
   - Provide the name of CA-Pan/SQL message extract program source member on the EXEC SQL INCLUDE statement. If you are running a DB2 Server for VSE Version 2.1 or lower, specify DQSMMTB. If you are running DB2 Server for VSE Version 2.2 or greater, specify DQSMMTB3.
   - Provide the password for the SQLDBA user ID.

3. In step ASMMTB (which assembles the output of the message extract program):
   - Change the CUU on the CLOSE SYSPCH statement to point back to the original address for SYSPCH.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSIN and SYSIPT statements to identify the data set created in the PREMTB step of this JCL.
4. In step LNKMTB (which links the output of the assembly of the message extract program):
   - Change the SQLLIB DLBL, EXTENT, and LIBDEF statements to reference *_your.sql.interface.library_* and common sublibrary. The SQLLIB library was created as part of the initial RESTORE job.
   - Change the IBMLIB DLBL, EXTENT, and LIBDEF statements to reference *your.ibm.sql.object.library* that includes ARIPRDID.
5. In step CLOSE, change the CUU on the CLOSE SYSIPT statement to point back to the original address for SYSIPT.
6. In step EXCMTB (which executes the message extract program):
   - Change the IBMLIB DLBL, EXTENT, and LIBDEF statements to reference *your.ibm.sql.phase.library*.
   - Change the SQLLIB DLBL, EXTENT, and LIBDEF statements to reference *your.sql.interface.library* and common sublibrary.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSPH and SYSPCH statements to identify an output disk data set. Approximately 2000 KB bytes or thirty-five 3380 tracks are needed.
7. In step CLOSE, change the CUU on the CLOSE SYSPCH statement to point back to the original address for SYSPCH.
8. In step ASMTEXT (which assembles the assembly file output produced by the EXTRACT program):

- Change the file name, VOLSER, and starting track address and length on the IJSYSIN and SYSIPT statements to identify the data set created in the EXCMTB step of this JCL.
- Change the file name, VOLSER, and starting track address and length on the IJSYSPH and SYSPCH statements to identify an output disk data set. Approximately 2000 KB bytes or thirty-five 3380 tracks are needed.

9. In step CTLTEXT (which catalogs the object deck produced by the assembly):
   - Change the CUU on the CLOSE SYSIPT statement to point back to the original address for SYSIPT.
   - Change the CUU on the CLOSE SYSPCH statement to point back to the original address for SYSPCH.
   - Change the SQLLIB DLBL and EXTENT statements to reference *your.sql.interface.library*.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSIN and SYSIPT statements to identify the data set created in the ASMTEXT step of this JCL.
   - Change the name of sublibrary on the EXEC LIBR statement to reference the SQL common sublibrary.
10. In step CLOSE, change the CUU on the CLOSE SYSIPT statement to point back to the original address for SYSIPT.
11. Provide a valid EOJ statement.

JOB CTGVIEW

1. Change the JOB statement to conform to your site's standards.
2. In step SRCVIEW (which copies the source for creating the views for the CA-Pan/SQL catalog facility):
   - Change the SQLLIB DLBL, EXTENT, and LIBDEF statements to reference *your.sql.interface.library* and common sublibrary. The SQLLIB library is created as part of the initial RESTORE job.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSPH and SYSPCH statements to identify an output disk data set. Approximately fifteen 3380 tracks are needed.
3. In step CTGVIEW (which creates the views for the CA-Pan/SQL interface catalog facility):
   - Change the CUU on the CLOSE SYSPCH statement to point back to the original address for SYSPCH.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSIN and SYSIPT statements to identify the data set created in the SRCVIEW step of this JCL.
4. In step CLOSE, change the CUU on the CLOSE SYSIPT statement to point back to the original address for SYSIPT.
5. Provide a valid EOJ statement.

JOB SQLCMD

1. Change the JOB statement to conform to your site's standards.
2. In step PRECMD (which preprocesses the Interface Command Processor):
   - Change the SQLLIB DLBL, EXTENT, and LIBDEF statements to reference *your.sql.interface.library* and common sublibrary. The SQLLIB library was created as part of the initial RESTORE job.

- Change the IBMLIB DLBL, EXTENT, and LIBDEF statements to reference the phase library containing the program ARIPRPA.
- Change the file name, VOLSER, and starting track address and length on the IJSYSPH and SYSPCH statements to identify an output disk data set. Approximately seventy-five 3380 tracks are needed.
- Provide the password for the SQLDBA user ID.
- Assign a PREPNAME for the Interface Command Processor. The default is DQPS024.
- Provide the name of the CA-Pan/SQL Interface Command Processor source member on the EXEC SQL INCLUDE statement. If you are running a DB2 Server for VSE version lower than 3.0, specify DQSMCMD. If you are running a DB2 Server for VSE version 3.0 or greater, specify DQSMCMD3.

3. In step ASMCMD (which assembles the output of the SQL preprocessor):
   - Change the CUU on the CLOSE SYSPCH statement to point back to the original address for SYSPCH.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSIN and SYSIPT statements to identify the data set created in the PRECMD step of this JCL.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSPH and SYSPCH statements to identify an output disk data set. Approximately fifteen 3380 tracks are required.
4. In step CTLCMD (which catalogs the object deck produced by the assembly):
   - Change the CUU on the CLOSE SYSIPT statement to point back to the original address for SYSIPT.
   - Change the CUU on the CLOSE SYSPCH statement to point back to the original address for SYSPCH.

- Change the SQLLIB DLBL and EXTENT statements to reference *your.sql.interface.library*. The SQLLIB library was created as part of the initial RESTORE job.
- Change the file name, VOLSER, and starting track address and length on the IJSYSIN and SYSIPT statements to identify the data set created in the ASMCMD step of this JCL.
- Change the name of the sublibrary on the EXEC LIBR statement to reference the SQL common sublibrary.

5. In step GRANT (which grants execution access on the command processor to the public):
   - Change the CUU on the CLOSE SYSIPT statement to point back to the original address for SYSIPT.
   - Provide the password for the SQLDBA user ID.
   - Provide the name of the Interface Command Processor access module that was created by step PRECMD of this job. This must be the same name provided for PREPNAME of step PRECMD.
6. Provide a valid EOJ statement.

Step 8. Install CA-Pan/SQL for Batch

To install CA-Pan/SQL for batch:

- Modify and submit the JCL of job SQLINST2 in FILE03 of the tape.
- Modify the JCL of the host product.

These tasks are described in the following.

Modify and Run SQLINST2

In job SQLINST2, change the JOB statement to conform to your site's standards.

In step LNKBTCH:

- Change the SQLLIB DLBL and EXTENT to reference *your.sql.interface.library*. This SQLLIB library was created by the initial RESTORE job.
- Change the IBMLIB DLBL, EXTENT and LIBDEF OBJ statements to reference *your.ibm.sql.object.library* that includes module ARIPRDID.
- Change the LIBDEF OBJ statement to reference the SQL interface common and batch sublibraries.
- Change the LIBDEF PHASE statement to reference *your.sql.interface.batch.sublib* that was created by the initial RESTORE job.
- Provide a valid EOJ statement.

Submit the job and verify the results.

Modify JCL of Host Product

When the installation of CA-Pan/SQL completes, see the *Getting Started* of the Computer Associates product or products using CA-Pan/SQL. Incorporate the CA-Pan/SQL interface batch sublibrary and the required IBM DB2 Server for VSE libraries into the product's runtime JCL.

Step 9. Install CA-Pan/SQL for CICS

To install CA-Pan/SQL for CICS:

- Modify and submit the JCL of job SQLINST3 in FILE04 of the tape.
- Modify the JCL of the host product

- Rename the CA-Pan/SQL modules (optional)
- Update the CICS PPT
- Modify the CICS startup JCL

These tasks are described in the following.

Modify SQLINST3

In job SQLINST3, change the JOB statement to conform to your site's standards.

In step LNKCICS:

- Change the SQLLIB DLBL and EXTENT to reference *your.sql.interface.library*. This SQLLIB library was created by job SQLRSTR.
- Change the CICSLIB DLBL, EXTENT and LIBDEF OBJ statements to reference *your.ibm.cics.object.library* that includes module DFHEAI.
- Change the IBMLIB DLBL, EXTENT and LIBDEF OBJ statements to reference *your.ibm.sql.object.library* that includes module ARIRRTED.
- Change the LIBDEF OBJ statement to reference the SQL Interface common and CICS sublibraries, which contain the link control statements LNKS*xx*, the common object modules OMSMMTB1, OMSMCMD1, and the interface CICS modules.
- Change the LIBDEF PHASE statement to reference your SQL interface CICS sublibrary that was created by job SQLRSTR.
- Provide a valid EOJ statement.

Modify JCL of Host Product

When the installation of CA-Pan/SQL completes, see the *Getting Started* of the Computer Associates product or products using CA-Pan/SQL. Incorporate the CA-Pan/SQL interface CICS sublibrary and the required IBM DB2 Server for VSE libraries into the product's runtime JCL.

Rename the CA-Pan/SQL Modules (Optional)

The CA-Pan/SQL modules exist in the phase library with a prefix of DQSPS. If this naming convention conflicts with existing CICS modules at your site, CA-Easytrieve/ESP and CA-General/OL products allow for the interface modules to be renamed. See the *Getting Started* for each host product as to the correct installation procedure for renamed CA-Pan/SQL modules.

Update the CICS PPT

The following entries must be added to your CICS Program Processing Table. These table entries can be found in member CICSPPT of the CA-Pan/SQL common sublibrary. If you renamed the CA-Pan/SQL interface modules, then the PPT entries must be changed to reflect the new names.

```
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCF,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCG,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCV,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXM,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSMELT,PGMLANG=ASSEMBLER
```

Modify CICS Start-up JCL

When the installation of CA-Pan/SQL completes, modify your CICS startup JCL to include the CA-Pan/SQL interface CICS sublibrary (SQLLIB.cics).

See the *Getting Started* of the Computer Associates product using CA-Pan/SQL for additional changes to the CICS startup JCL.

CA-Datacom/DB (VSE)

The installation of CA-Pan/SQL assumes that you have a functioning CA-Datacom/DB with the SQL option and that you are familiar with SQL programming for CA-Datacom/DB.

This chapter describes how to install the Computer Associates SQL interface (CA-Pan/SQL) in VSE. The installation procedure transfers CA-Pan/SQL from the installation tape to disk files at your site.

You should install CA-Pan/SQL in a separate library from the Computer Associates product or products that use CA-Pan/SQL. This separate library must then be supplied in the JCL required to execute the host product or products. For JCL modifications, see the *Getting Started* for each host product.

All CA-Pan/SQL interface modules are link-edited in the Phase library with a prefix of DQSPS. All modules are re-entrant.

The complete installation procedure installs the following components:

- Batch interface
- Default plan options module for batch
- CICS interface
- Default plan options module for CICS

Installing CA-Pan/SQL for CA-Datacom/DB

The steps to install CA-Pan/SQL for CA-Datacom/DB in VSE are:

1. Determine DASD requirements for CA-Pan/SQL libraries
2. Retrieve installation files from the tape
3. Edit and run RESTORE JCL
4. Install CA-Pan/SQL for batch
5. Create default plan options module for batch (optional)
6. Install CA-Pan/SQL for CICS
7. Create default plan options module for CICS (optional)

Step 1. Determine DASD Requirements for CA-Pan/SQL Libraries

CA-Pan/SQL installation restores the interface components to three sublibraries: a **common** source and object library, a **batch** phase and object library, and a **CICS** phase and object library. You must define separate phase and object libraries for batch and CICS because the interface modules are identically named in both environments.

Use the following table to determine the DASD space required for each library.

Library	KBs
Common source and object	150
Batch phase and object	1600
CICS phase and object	1600

Step 2. Retrieve Installation Files from the Tape

Retrieve the first five files from the installation tape. These files contain the JCL to install CA-Pan/SQL for VSE batch and CICS.

File	Block Size	Description
01	80	Executes the Librarian RESTORE command to create and load the CA-Pan/SQL library
02	80	JCL to install CA-Pan/SQL for batch
03	80	JCL to create a plan options module for batch
04	80	JCL to install CA-Pan/SQL for CICS
05	80	JCL to create a plan options module for CICS

Step 3. Edit and Run RESTORE JCL

Retrieve the JCL in FILE01 of the tape, and modify the JCL as shown in the following.

- Change the JOB statement to conform to your site's standards.
- Set the file ID of *your.pansql.datacom.interface.library* for the SQLLIB DLBL.
- Change the VOLSER on the EXTENT statement to point to the correct volume.
- Provide a name for the sublibrary that is to contain the common source and object for SQLLIB.common.
- Provide a name for the sublibrary that is to contain the interface batch object and phase modules for SQLLIB.batch.
- Provide a name for the sublibrary that is to contain the interface CICS object and phase modules for SQLLIB.cics.
- Change *ttt* on the ASSGN statement to the tape unit number for your installation.

- Provide a valid EOJ statement.

Submit the RESTORE JCL and review the results. The following files and libraries should now exist at your site:

File	Sub-library	Member	Description
01		SQLRSTR	JCL to restore the CA-Pan/SQL libraries
02		SQLINST1	JCL to install CA-Pan/SQL for batch
03		SQLINST2	JCL to install plan options module for batch
04		SQLINST3	JCL to install CA-Pan/SQL for CICS
05		SQLINST4	JCL to create plan options module for CICS
06	COMMON	LNKV*xx*	Control statements to link interface for batch
		LNKS*xx*	Control statements to link interface for CICS
		CICSPPT	CICS PPT entries for the CA-Pan/SQL modules
		DQPLNOPT	Macro to generate plan options module
		PSQLVRSN	Data control statement identifying the version, release, and genlevel of CA-Pan/SQL
07	BATCH	OMS*xxxxx*	Object modules for batch
08	CICS	OMS*xxxxx*	Object modules for CICS

Step 4. Install CA-Pan/SQL for Batch

To install CA-Pan/SQL for batch:

- Modify and run SQLINST1
- Modify the JCL for the host product

Modify and Run SQLINST1

Job SQLINST1, which exists in your CA-Pan/SQL common library, installs CA-Pan/SQL for TSO/batch. This job simply executes a link step.

Modify the JCL for the Host Product

Before submitting this job for execution, modify the JCL as follows:

- Modify the JOB statement to conform to your site's standards.
- Change the SQLLIB DLBL and EXTENT statements to reference *your.pansql.datacom.interface.library*. This SQLLIB library was created as part of the initial RESTORE job.
- Change the LIBDEF OBJ statements to reference your CA-Pan/SQL interface common and batch sublibraries.
- Change the LIBDEF PHASE statement to reference your CA-Pan/SQL interface batch sublibrary.
- Provide a valid EOJ statement.

Submit job SQLINST1 and verify the results. All link steps should complete with a return code of 0, except for phase DQSMURT. This link completes with a return code of 4 and an unresolved external reference for DBMSCBL.

Step 5. Create Default Plan Options Module for Batch

The CA-Pan/SQL interface for CA-Datacom/DB creates a plan for each user application program during the compile or preprocessing phase. All of the SQL statements for the given user program are grouped into a single plan. When a plan is created, certain attributes are defined. These attributes then apply to all SQL statements that are inserted (compiled) into the plan.

The CA-Pan/SQL interface is installed with a default plan options module named DQSMPLN@. A separate default module exists for the CICS environment and batch environment. The attributes of these plan options modules are the default values listed for each option described in the following. To generate a different set of attributes for your site's default batch plan options module, you can execute the SQLINST2 job, providing a PLANNME of DQSMPLN@.

Job SQLINST4 can be used to create a new plan for the CICS environment.

Before submitting SQLINST2 for execution, you must decide on the attributes of your plan options module. The plan options that you can specify correspond to the CA-Datacom/DB SQL precompiler options. These options are explained in detail in the CA-Datacom/DB *SQL Programming Guide and Reference*.

The following is a brief description of each option.

CBSIO

Specifies an I/O limit interrupt value for all SQL commands that will create a set. This option allows application environments to establish their maximums in I/O and set processing relative to their requirements.

Valid entries are 0 to 65535. The value specified is multiplied by 8 by CA-Datacom/DB. The actual maximum value is 524280.

Default value: 1

PRTY

Specifies the priority of the SQL requests from the plan within the Multi-User Facility. The lowest priority is 1; the highest priority is 15. You should see your database administrator for the correct setting of this parameter.

Default value: 7

WAITMIN and WAITSEC

Specifies the exclusive control wait time limit in minutes (WAITMIN) and seconds (WAITSEC).

This option permits a program to wait or not wait for an explicit amount of time when another job is holding a requested record under exclusive control. If this time is exceeded, the application program receives a -117 value in the SQLCODE of the SQL Communication Area and a CA-Datacom/DB return code of 61 to inform the user that the record was not available.

Specifying a zero-value for both WAITMIN and WAITSEC means that there is no time limit, and without a limit on the wait time, a "wait forever" condition is possible. A zero-value for both WAITMIN and WAITSEC is not valid.

Default value: WAITMIN=0,WAITSEC=1

PLANCLS

Specifies when the plan and user requirements tables are to be closed.

A value of T indicates that the plan and user requirements tables are to be closed when the transaction ends, that is, when an SQL COMMIT WORK, SQL ROLLBACK WORK, or a CA-Datacom/CICS Services DEQUE is executed.

A value of R indicates that the plan and user requirements tables are to be closed when the run unit ends or when a CA-Datacom/DB CLOSE command is issued.

The T option is recommended for the CICS environment and the R option is recommended for the batch environment.

Default value: T for CICS; R for batch

ISOL

Specifies the isolation level or the degree to which a unit of recovery in your application is isolated from the updating operations of other units of recovery.

A value of U (for uncommitted data) indicates no locks are acquired for any rows updated.

A value of C (for cursor stability) indicates that locks are acquired for all rows accessed.

Default value: C

SQLMODE

Specifies the mode in which to process the program.

Valid values are ANSI, FIPS, and DATACOM.

If you specify ANSI or FIPS, then all of your SQL statements must be coded according to ANSI or FIPS standards. Names for tables, columns, views, synonyms, and cursors must be 1 to 18 characters in length.

If you specify DATACOM, your program is processed in extended mode which means CA-Datacom/DB extensions to the standards are allowed in your SQL statements. Names for tables, columns, views, synonyms and cursors can be 1 to 32 characters in length. The CA-Pan/SQL interface currently has a 30-character limit for cursor names.

Default value: DATACOM

PRMSGS and EXMSGS

Specifies the level of messages you want generated by the SQL optimizer at preprocess time and execution time.

Valid values for each category of message follow:

- **D** means detail level messages
- **S** means summary level messages
- **N** means no messages.

Default values: PRMSGS=N; EXMSGS=N

OPTMODE

Specifies the join optimization mode.

Valid values are P and M. A value of P specifies normal join optimization. A value of M (manual join order) indicates that you want tables joined as they are listed in the FROM clause of your SQL statement. This results in a nested loop join.

Default value: P

TIME

Specifies the output format for columns of data type TIME.

Valid values follow:

	Output Form	Standard
ISO	hh.mm.ss	International Standards Organization
EUR	hh.mm.ss	IBM European Standard
JIS	hh:mm:ss	Japanese Industrial Standard
USA	hh.mm AM or PM	IBM USA Standard

Default value: the value specified in the Multi-User Facility's TIME startup option.

DATE

Specifies the output format for columns of data type DATE.

Valid values follow:

	Output Form	Standard
ISO	yyyy-mm-dd	International Standards Organization
EUR	dd.mm.yyyy	IBM European Standard
JIS	yyyy-mm-dd	Japanese Industrial Standard
USA	mm/dd/yyyy	IBM USA Standard

Default value: the value specified in the Multi-User Facility's DATE startup option.

PLANNME

Specifies the name of your plan options module. A valid eight-character load module name must be specified.

Default value: no default

Modify and Run SQLINST2

Before submitting job SQLINST2 for execution, you must make the following JCL modifications:

1. Modify the JOB statement to conform to your site's standards.
2. In step MACRO:
   - Change the SQLLIB DLBL and EXTENT statements to reference *your.pansql.datacom.interface.library*. This SQLLIB library was created as part of the initial RESTORE job.
   - Change the LIBDEF source statement to reference *your.pansql.interface.COMMON.sublib*.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSPCH and SYSPCH statements to identify an output disk data set. A length of 15 tracks is adequate.

- Provide the new attributes for the plan options module on the DQPLNOPT macro statement.
- Specify the new plan options name for the PLANNME parameter of the DQPLNOPT macro statement. This name must match the PHASE statement of the ASMOPTS step.

3. In step ASMOPTS:
   - Change the CUU on the CLOSE SYSPCH statement to point back to the original address for SYSPCH.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSIN and SYSIPT statements to identify the data set created in step MACRO.
   - Specify the name of the plan options module for the PHASE statement. This name must match the name specified for the PLANNME parameter of the DQPLNOPT macro statement.
   - Change the SQLLIB DLBL, EXTENT and LIBDEF statements to reference *your.pansql.datacom.interface.library* and batch sublibrary.
   - Change the CUU on the CLOSE SYSIPT statement to point back to the original address for SYSIPT.
   - Provide a valid EOJ statement.

Submit job SQLINST2. Verify the output for any macro or assembly errors.

Step 6. Install CA-Pan/SQL for CICS

To install CA-Pan/SQL for CICS:

- Modify and run SQLINST3.
- Rename the CA-Pan/SQL modules (optional)..
- Update the CICS PPT.
- Modify CICS startup JCL.

Modify and Run SQLINST3

Job SQLINST3, which exists in your CA-Pan/SQL source library, installs CA-Pan/SQL for CICS. This job simply executes a link step.

Before submitting this job for execution, modify the JCL as follows:

- Modify the JOB statement to conform to your site's standards.
- Change the SQLLIB DLBL and EXTENT statements to reference *your.pansql.datacom.interface.library*. This SQLLIB library was created as part of the initial RESTORE job.
- Change the CICSLIB DLBL, EXTENT and LIBDEF OBJ statements to reference *your.ibm.cics.object.library* that include module DFHEAI.
- Change the LIBDEF OBJ statements to reference *your.pansql.interface.COMMON* and CICS sublibraries.
- Change the LIBDEF PHASE statement to reference *your.pansql.interface.CICS.sublib*.
- Provide a valid EOJ statement.

Submit job SQLINST3 and verify the results. The link step should complete with a condition code of zero.

Rename the CA-Pan/SQL Modules (Optional)

The CA-Pan/SQL modules exist in the PHASE library with a prefix of DQSPS. If this naming convention conflicts with existing CICS modules at your site, CA-Easytrieve/ESP and CA-General/OL products allow for the interface modules to be renamed. See the *Getting Started* for each host product as to the correct installation procedure for renamed CA-Pan/SQL modules.

Update the CICS PPT

The following entries must be added to your CICS Program Processing Table. These table entries can be found in member CICSPPT of the CA-Pan/SQL common sublibrary. If you renamed the CA-Pan/SQL interface modules, then the PPT entries must be changed to reflect the new names.

```
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCF,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCG,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCV,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXM,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSMELT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSMPLN@,PGMLANG=ASSEMBLER
```

Note: If you created a new plan options module for CICS, then you **must** add a PPT entry for the module.

It is assumed that you have a functioning SQL option installed for your CA-Datacom/DB in your CICS region. If not, see your CA-Datacom/DB manuals for the proper installation and verification of the SQL option.

CA-Pan/SQL should not be used to verify your CA-Datacom/DB SQL option.

Modify CICS Start-up JCL

When the installation of CA-Pan/SQL completes, modify your CICS startup JCL to include the CA-Pan/SQL interface CICS sublibrary (SQLLIB.cics).

See the *Getting Started* of the Computer Associates product using CA-Pan/SQL for additional changes to the CICS startup JCL.

Step 7. Create Default Plan Options Module for CICS

Installation job SQLINST4 can be used to create a new plan options module or change the attributes of default plan options module DQSMPLN@ for the CICS environment.

Before submitting SQLINST4 for execution, you need to decide on the attributes of your plan options module for the CICS. These options are explained in Step 5. Create Default Plan Options Module for Batch.

Modify and Run SQLINST4

Before submitting job SQLINST4 for execution, you must make the following JCL modifications:

1. Modify the JOB statement to conform to your site's standards.
2. In step MACRO:
   - Change the SQLLIB DLBL and EXTENT statements to reference *your.pansql.datacom.interface.library*. This SQLLIB library was created as part of the initial RESTORE job.
   - Change the LIBDEF source statement to reference *your.pansql.interface.COMMON.sublib*.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSPCH and SYSPCH statements to identify an output disk data set. A length of 15 tracks is adequate.
   - Provide the new attributes for the plan options module on the DQPLNOPT macro statement.
   - Specify the new plan options name for the PLANNME parameter of the DQPLNOPT macro statement. This name must match the PHASE statement of the ASMOPTS step.

3. In step ASMOPTS:
   - Change the CUU on the CLOSE SYSPCH statement to point back to the original address for SYSPCH.
   - Change the file name, VOLSER, and starting track address and length on the IJSYSIN and SYSIPT statements to identify the data set created in step MACRO.
   - Specify the name of the plan options module for the PHASE statement. This name must match the name specified for the PLANNME parameter of the DQPLNOPT macro statement.
   - Change the SQLLIB DLBL, EXTENT and LIBDEF statements to reference *your.pansql.datacom.interface.library* and CICS sublibrary.
   - Change the CUU on the CLOSE SYSIPT statement to point back to the original address for SYSIPT.
   - Provide a valid EOJ statement.

Submit job SQLINST4. Verify the output for any macro or assembly errors.

- If you are creating a new plan options module with a name other than DQSMPLN@, then you must add the new name to the CICS PPT.

CA-IDMS with SQL (VSE)

The installation of CA-Pan/SQL assumes that you have a functioning CA-IDMS with SQL and that you have a good understanding of SQL programming for CA-IDMS.

This chapter describes how to install the Computer Associates SQL interface (CA-Pan/SQL) in VSE. The installation procedure transfers CA-Pan/SQL from the installation tape to disk files at your site.

You should install CA-Pan/SQL in a separate library from the Computer Associates product or products that use it. This separate library must then be supplied in the JCL required to execute the host product or products. For JCL modifications, see the *Getting Started* for each host product.

All CA-Pan/SQL interface modules are link-edited in the PHASE library with a prefix of DQSPS. All modules are re-entrant.

The complete installation procedure installs the following components:

- Batch interface
- CICS interface

Installing CA-Pan/SQL for CA-IDMS

Complete the following steps to install CA-Pan/SQL for CA-IDMS in VSE:

1. Determine DASD requirements for CA-Pan/SQL libraries
2. Retrieve installation files from the tape
3. Edit and run RESTORE JCL
4. Install CA-Pan/SQL for batch
5. Install CA-Pan/SQL for CICS

Step 1. Determine DASD Requirements for CA-Pan/SQL Libraries

CA-Pan/SQL installation restores the interface components to three sublibraries: a common source and object library, a batch phase and object library, and a CICS phase and object library. You must define separate phase and object libraries for batch and CICS because the interface modules are identically named in both environments.

Use the following table to determine the DASD space required for each library.

Library	KBs
Common source and object	50
Batch phase and object	1500
CICS phase and object	1500

Step 2. Retrieve Installation Files from the Tape

Retrieve the first three files from the installation tape. These files contain the JCL to install CA-Pan/SQL for VSE batch and CICS.

File	Block Size	Description
01	80	Executes the Librarian RESTORE command to create and load the CA-Pan/SQL libraries
02	80	JCL to install CA-Pan/SQL for batch
03	80	JCL to install CA-Pan/SQL for CICS

Step 3. Edit and Run RESTORE JCL

Retrieve the JCL in FILE01 of the tape, and modify the JCL as shown in the following.

- Change the JOB statement to conform to your site's standards.
- Set the file ID of *your.pansql.idms.interface.library* for the SQLLIB DLBL.
- Change the VOLSER on the EXTENT statement to point to the correct volume.
- Provide a name for the sublibrary that is to contain the common source and object for SQLLIB.common.

- Provide a name for the sublibrary that is to contain the interface batch object and phase modules for SQLLIB.batch.
- Provide a name for the sublibrary that is to contain the interface CICS object and phase modules for SQLLIB.cics.
- Change *ttt* on the ASSGN statement to the tape unit number for your installation.
- Specify the names of the common, batch, and CICS sublibraries on the RESTORE statements.
- Provide a valid EOJ statement.

Submit the RESTORE JCL and review the results. The following files and libraries should now exist at your site:

File	Sublibrary	Member	Description
01		SQLRSTR	JCL to restore CA-Pan/SQL libraries
02		SQLINST1	JCL to install CA-Pan/SQL for batch
03		SQLINST2	JCL to install CA-Pan/SQL for CICS
04	COMMON	LNKV*xx*	Control statements to link interface for batch
		LNKS*xx*	Control statements to link interface for CICS
		CICSPPT	CICS PPT entries for the CA-Pan/SQL modules
		PSQLVRSN	Data control statement identifying version, release and genlevel of CA-Pan/SQL
		OMSCMD05	Object deck for Interface Command Processor to support 3 non-cursor and 5 cursor statements

File	Sublibrary	Member	Description
		OMSCMD10	Object deck for Interface Command Processor to support 6 non-cursor and 10 cursor statements
		OMSCMD20	Object deck for Interface Command Processor to support 12 non-cursor and 20 cursor statements
		OMSCMD30	Object deck for Interface Command Processor to support 18 non-cursor and 30 cursor statements
		OMSCMD50	Object deck for Interface Command Processor to support 14 non-cursor and 50 cursor statements
		OMSCMD63	Object deck for Interface Command Processor to support 1 non-cursor and 63 cursor statements
05	BATCH	OMS*xxxxx*	Object modules for batch
06	CICS	OMS*xxxxx*	Object modules for CICS

Step 4. Install CA-Pan/SQL for Batch

To install CA-Pan/SQL for batch:

- Modify link control statements for batch
- Modify and run SQLINST1
- Modify the JCL for the host product

Modify Link Control Statements for Batch

The CA-Pan/SQL batch sublibrary contains several object members named OMSCMD*xx*, which are various versions of the Interface Command Processor.

The Interface Command Processor module contains the static SQL statements that are needed for processing your application SQL program for the CA-IDMS SQL database. Several versions of this module exist in your batch sublibrary. See the following list for the object modules and the statements they support.

For example, module OMSCMD10 contains the necessary statements to support the processing of a maximum of 10 cursors and 6 non-cursor statements. Cursor statements are the "DECLARE" cursor statements; non-cursor statements are the INSERT, DELETE, and UPDATE statements. The module is limited to the processing of 10 cursors, but it is not really limited to the 6 non-cursor statements. Non-cursor statements can be reused by the interface, but cursor statements cannot. You must choose a Command Processor module that suits the processing requirements of your site.

The Command Processor is limited to a maximum of 64 statements (that is, a combination of cursor and non-cursor statements).

The installation common sublibrary contains members LNKV*xx* and LNKS*xx* which are the link control statements for linking the CA-Pan/SQL interface modules for the batch and CICS environments. Before submitting job SQLINST1 for execution, you can modify the link control statements to incorporate the required Command Processor object deck.

The default module used is OMSCMD10. If you need a different module, you must change the appropriate control statement to reflect the correct name. Otherwise, you can use the link control statements as they are.

Listed in the following are the link control statements for the batch environment. The INCLUDE for member OMSCMD10 can be modified but not removed. Be sure to change the name of the module for all occurrences.

```
Source member LNKVCC
  INCLUDE OM#PSCC
  INCLUDE OMSCCHKI
  INCLUDE OMSCTKN
  INCLUDE OMSCCTBI
  INCLUDE OMSMBDAI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMMSGI
  INCLUDE OMSMELM
  INCLUDE OMSMELF
  INCLUDE OMSMQLDV
  INCLUDE IDMS
Source member LNKVCF (no modification required)
  INCLUDE OM#PSCF
  INCLUDE OMSCSEMI
  INCLUDE OMSCCCK
  INCLUDE OMSCSTM
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSG
  INCLUDE OMSMQLDV
Source member LNKVCG

  INCLUDE OM#PSCG
  INCLUDE OMSCCTG
  INCLUDE OMSCCTPI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMGTM
  INCLUDE OMSMGIX
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMQLDV
  INCLUDE OMSMMSGI
  INCLUDE IDMS
Source member LNKVCI
  INCLUDE OM#PSCI
  INCLUDE OMSCINTI
  INCLUDE OMSCMD10 (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDV
  INCLUDE IDMS
Source member LNKVCR (no modification required)
  INCLUDE OM#PSCR
  INCLUDE OMSCRSTI
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSG
  INCLUDE OMSMQLDV
```

```
Source member LNKVCS
  INCLUDE OM#PSCS
  INCLUDE OMSCSQLI
  INCLUDE OMSCTKN
  INCLUDE OMSCCTBI
  INCLUDE OMSCCTM
  INCLUDE OMSCDTM
  INCLUDE OMSMBDAI
  INCLUDE OMSCMD10 (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDV
  INCLUDE IDMS
Source member LNKVCT
  INCLUDE OM#PSCT
  INCLUDE OMSCTRMI
  INCLUDE OMSCMD10 (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSG
  INCLUDE OMSMQLDV
  INCLUDE IDMS
Source member LNKVXC
  INCLUDE OM#PSXC
  INCLUDE OMSXCNTI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSG
  INCLUDE OMSMQLDV
  INCLUDE IDMS
Source member LNKVXM  (no modification required)
  INCLUDE OM#PSXM
  INCLUDE OMSMMSGI
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMQLDV
Source member LNKVXI
  INCLUDE OM#PSXI
  INCLUDE OMSXINTI
  INCLUDE OMSCMD10 (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDV
  INCLUDE IDMS
Source member LNKVXR
  INCLUDE OM#PSXR
  INCLUDE OMSXRSTI
  INCLUDE OMSCMD10 (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSG
  INCLUDE OMSMQLDV
  INCLUDE IDMS
```

```
Source member LNKVXS
  INCLUDE OM#PSXS
  INCLUDE OMSXSQLI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMBDAI
  INCLUDE OMSMGTM
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDV
  INCLUDE IDMS
Source member LNKVXT
  INCLUDE OM#PSXT
  INCLUDE OMSXTRMI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDV
  INCLUDE IDMS
Source member LNKVELT (no modification required)
  INCLUDE OMSMELT
Source member LNKVCV (no modification required)
  INCLUDE OMSCVRSI
```

Modify and Run SQLINST1

Job SQLINST1, which exists in your CA-Pan/SQL common sublibrary and as FILE02 of the installation tape, installs CA-Pan/SQL for batch. This job simply executes several link steps.

Modify the JCL for the Host Product

Before submitting this job for execution, modify the JCL as follows:

- Modify the JOB statement to conform to your site's standards.
- Change the SQLLIB DLBL and EXTENT statements to reference *your.pansql.idms.interface.library*. This SQLLIB library was created by the SQLRSTR job.
- Change the IDMSLIB DLBL and EXTENT statements to reference *your.idms.system.library*. This library should contain member IDMS.

- Change the LIBDEF OBJ statement to reference your CA-Pan/SQL interface common and batch sublibraries, and your CA-IDMS system library.
- Change the LIBDEF PHASE statement to reference your CA-Pan/SQL interface batch sublibrary.
- Provide a valid EOJ statement.

Submit job SQLINST1 and verify the results. The link steps should complete with a condition code of 0 or 2.

Step 5: Install CA-Pan/SQL for CICS

To install CA-Pan/SQL for CICS:

- Modify link control statements for CICS
- Modify and run SQLINST2
- Rename the CA-Pan/SQL modules (optional)
- Update the CICS PPT
- Modify CICS startup JCL

Modify Link Control Statements for CICS

As stated in the explanation of Modify Link Control Statements for Batch, the same modifications are valid for the CICS environment. Listed in the following are the link control statements for CICS. If you must choose a different member for the Interface Command Processor, change the name for all occurrences.

Link Control Statements for CICS

```
Source member LNKSCC
  INCLUDE DFHEAI
  INCLUDE OM#PSCCS
  INCLUDE OMSCCHKI
  INCLUDE OMSCTKN
  INCLUDE OMSCCTBI
```

```
  INCLUDE OMSMBDAI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMELM
  INCLUDE OMSMELF
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSCF (no modification required)
  INCLUDE DFHEAI
  INCLUDE OM#PSCFS
  INCLUDE OMSCSEMI
  INCLUDE OMSCCCK
  INCLUDE OMSCSTM
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSG
  INCLUDE OMSMQLDS
 Source member LNKSCG
  INCLUDE DFHEAI
  INCLUDE OM#PSCGS
  INCLUDE OMSCCTG
  INCLUDE OMSCCTPI
  INCLUDE OMSCMD10 (you can change member name)
  INCLUDE OMSMGTM
  INCLUDE OMSMGIX
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSCI
  INCLUDE DFHEAI
  INCLUDE OM#PSCIS
  INCLUDE OMSCINTI
  INCLUDE OMSCMD10 (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSCR  (no modification required)
  INCLUDE DFHEAI
  INCLUDE OM#PSCRS
  INCLUDE OMSCRSTI
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSG
  INCLUDE OMSMQLDS
Source member LNKSCS
  INCLUDE DFHEAI
  INCLUDE OM#PSCSS
  INCLUDE OMSCSQLI
  INCLUDE OMSCTKN
  INCLUDE OMSCCTBI
  INCLUDE OMSCCTM
  INCLUDE OMSCDTM
  INCLUDE OMSMBDAI
```

```
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSCT
  INCLUDE DFHEAI
  INCLUDE OM#PSCTS
  INCLUDE OMSCTRMI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSXC
  INCLUDE DFHEAI
  INCLUDE OM#PSXCS
  INCLUDE OMSXCNTI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSXM  (no modification required)
  INCLUDE DFHEAI
  INCLUDE OM#PSXMS
  INCLUDE OMSMMSGI
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMQLDS
Source member LNKSXI
  INCLUDE DFHEAI
  INCLUDE OM#PSXIS
  INCLUDE OMSXINTI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSXR
  INCLUDE DFHEAI
  INCLUDE OM#PSXRS
  INCLUDE OMSXRSTI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSXS
  INCLUDE DFHEAI
  INCLUDE OM#PSXSS
  INCLUDE OMSXSQLI
```

```
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMBDAI
  INCLUDE OMSMGTM
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSXT
  INCLUDE DFHEAI
  INCLUDE OM#PSXTS
  INCLUDE OMSXTRMI
  INCLUDE OMSCMD10  (you can change member name)
  INCLUDE OMSMELF
  INCLUDE OMSMELM
  INCLUDE OMSMMSGI
  INCLUDE OMSMQLDS
  INCLUDE IDMSCINT
Source member LNKSELT  (no modification required)
  INCLUDE OMSMELT
Source member LNKSCV  (no modification required)
  INCLUDE OMSCVRSI
```

Modify and Run SQLINST2

Before submitting job SQLINST2 for execution, you must make the following JCL modifications:

- Job SQLINST2, which exists in your CA-Pan/SQL common sublibrary and as FILE03 of the installation tape, installs CA-Pan/SQL for CICS.
- This job simply executes several link steps.
- Modify the JCL as follows:
  - Modify the JOB statement to conform to your site's standards.
  - Change the SQLLIB DLBL and EXTENT statements to reference *your.pansql.idms.interface.library*. This SQLLIB library was created by the SQLRSTR job.
  - Change the IDMSLIB DLBL and EXTENT statements to reference *your.idms.system.library*. This library should contain member IDMSCINT.
  - Change the CICSLIB DLBL and EXTENT statements to reference *your.cics.system.library*. This library should contain member DFHEAI.

- Change the LIBDEF OBJ statement to reference your CA-Pan/SQL interface common and CICS sublibraries, your CA-IDMS system library, and your IBM CICS system library.
- Change the LIBDEF PHASE statement to reference your CA-Pan/SQL interface CICS sublibrary.
- Provide a valid EOJ statement.

Submit job SQLINST2 and verify the results. The link steps should complete with a condition code of 0 or 2.

Rename the CA-Pan/SQL Modules (Optional)

The CA-Pan/SQL modules exist in the PHASE library with a prefix of DQSPS. If this naming convention conflicts with existing CICS modules at your site, CA-Easytrieve/ESP and CA-General/OL allow for the interface modules to be renamed. See the *Getting Started* for each host product as to the correct installation procedure for renamed CA-Pan/SQL modules.

Update the CICS PPT

The following entries must be added to your CICS Program Processing Table. These table entries can be found in member CICSPPT of the CA-Pan/SQL common sublibrary. If you renamed the CA-Pan/SQL interface modules, then the PPT entries must be changed to reflect the correct names. You can only rename modules that begin with the five-character prefix of DQSPS.

```
CICS PPT Entries
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCF,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCG,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSCV,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXC,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXI,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXM,PGMLANG=ASSEMBLER
```

```
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXR,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXS,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSPSXT,PGMLANG=ASSEMBLER
DFHPPT TYPE=ENTRY,PROGRAM=DQSMELT,PGMLANG=ASSEMBLER
```

Note: We assume that you have a functioning SQL option installed for your CA-IDMS system for your CICS. If not, see your CA-IDMS manuals for the proper installation and verification of SQL for CA-IDMS. CA-Pan/SQL should not be used to verify your CA-IDMS SQL.

Modify CICS Start-up JCL

When the installation of CA-Pan/SQL completes, modify your CICS startup JCL to include the CA-Pan/SQL interface CICS sublibrary (SQLLIB.cics).

See the *Getting Started* of the Computer Associates product that uses CA-Pan/SQL for additional changes to the CICS startup JCL.

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