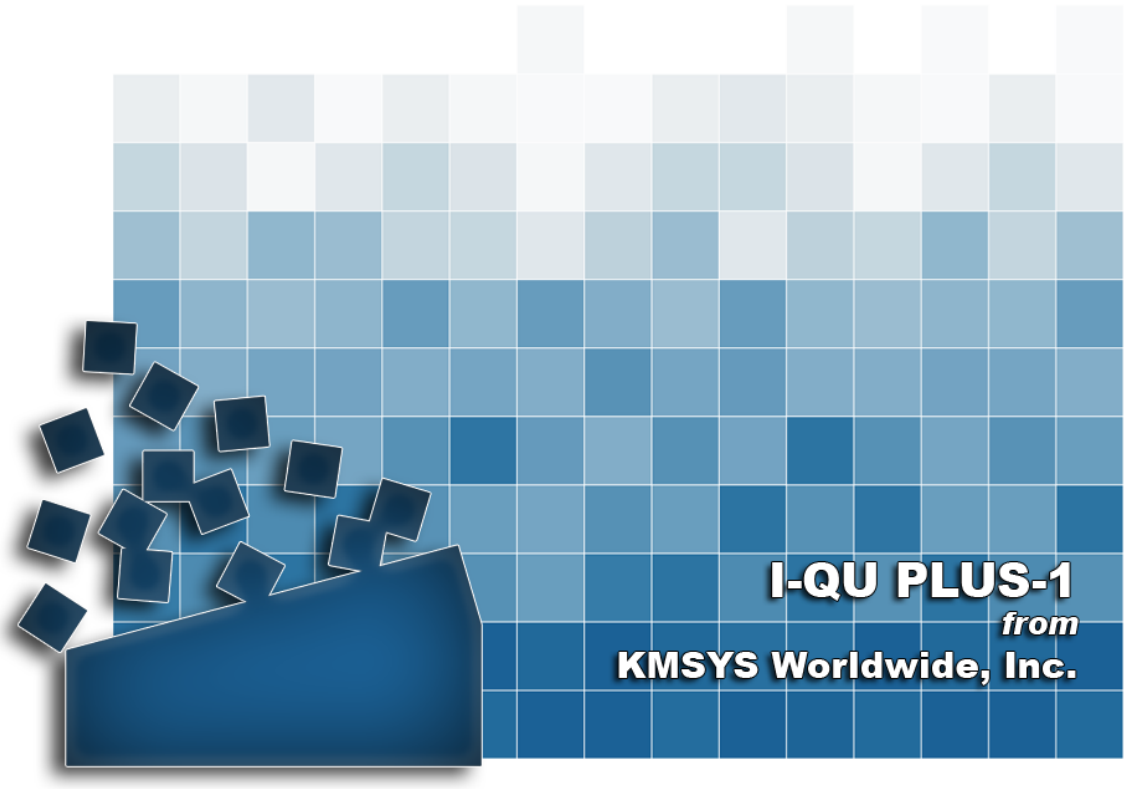

KMSYS
WORLDWIDE, INC

Installation Guide

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I-QU PLUS-1 Release 11R6, November 1999

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Important Notices!

For sites that are evaluating I-QU PLUS-1 for possible purchase, please see Section 1.5, "Quick Installation".

For those sites who are migrating from earlier release levels of I-QU PLUS-1, please read the README.TXT file found on the CD. Some of the differences described in that file may effect the I-QU PLUS-1 operating environment at your site.

Any I-QU PLUS-1 programs SAVEd in object form with earlier released levels of I-QU PLUS-1 must be recompiled to execute under this released level. KMSYS Worldwide, Inc. provides an SSG routine called "COMPILE-RUNS" which will automatically recompile all I-QU PLUS-1 programs. This routine can be found in the second I-QU PLUS-1 product file, SYSLIB*IQU-1 (default mode install). For other modes of installation, refer to the COMUS SRL after COMUS product registration.

With DMS 2200, level 9R1 or higher, the term, "DMR", is no longer used. Instead, Unisys documentation now refers to a logical data manager (LDM) for DMS running under Universal Data System (UDS) Control. I-QU PLUS-1 can interface with any number of LDMs through UDS Control. However, this documentation will continue to use the term, "DMR", in a generic fashion since I-QU PLUS-1 can interface with non-UDS DMS applications (e.g., 8R3) as well as DMS applications running under UDS Control.

Chapter 1: General Information

This manual contains technical information regarding the installation, support and operation of I-QU PLUS-1. The manual is intended for systems support personnel.

For sites that are evaluating I-QU PLUS-1 for possible purchase, please see Section 1.5, "Quick Installation."

1.1 Overview of Chapters

The manual is divided into six major chapters:

- Chapter 1 provides notes concerning the use of this publication, lists supporting software levels and minimum requirements, describes the release tape contents, and provides a quick installation procedure.
- Chapter 2 contains important information that should be considered prior to generating/installing I-QU PLUS-1.
- Chapter 3 shows the steps necessary to generate and install I-QU PLUS-1.
- Chapter 4 illustrates a simple procedure to verify the I-QU PLUS-1 installation.
- Chapter 5 provides a detailed description of I-QU PLUS-1's security facility and each SGS necessary to implement security.
- Chapter 6 contains information critical to generating a single-thread DMR to be collected with I-QU PLUS-1. This chapter is only required when a site does not wish to use the pre-generated single-thread DMR included on the I-QU PLUS-1 release tape (see Chapter 10, "DMS USERSGSs for Single-thread DMR").
- The remaining chapters contain considerations when installing and applying changes to subsequent installs.

1.2 Additional Documentation

The following manuals are available with the release of I-QU PLUS-1:

- I-QU PLUS-1 Applications Development User Guide
- I-QU PLUS-1 Programmer Reference
- I-QU PLUS-1 Database Reorganization User Guide
- I-QU PLUS-1 Database Reorganization Utility Reference

The two User Guides contain many examples illustrating I-QU PLUS-1 being used for applications development, prototyping, program testing, restructuring and database reorganization.

1.3 Syntax Notation

The following conventions are used throughout this manual in the description of I-QU PLUS-1 commands:

- Changes to this document since its last publication are marked with a change bar (an elongated vertical bar) as shown to the right of this paragraph.
- Important notes and warnings are encased in a box as shown around this bullet.
- All words in UPPERCASE letters (not italicized) are reserved keywords and must be entered exactly as shown.
- All italicized words (mostly in lowercase letters) are to be substituted by a user supplied name or value.
- Ellipsis (…) implies allowable, but omitted, repetitions in the published syntax. Please note that the ellipsis is ***not*** allowed in the command or directive when parsed.
- A vertical bar (|) represents an "or" or "and/or" operator.
- Selections appearing within brackets, "[ ]", are lists of optional items of which one may be selected. In the following example, neither A nor B is required, but either one or the other may be selected:

  [A | B]
- An underlined word in optional brackets represents the default value when not entered.
- Selections appearing within braces, "{ }", are lists of items of which one and only one must be selected. In the following example, one of either C, D or E must be selected:

  {C | D | E}
- Selections appearing within double vertical bars, "||", are lists of items of which one or more may be selected. The items between vertical bars are referred to as permutations and may be selected in any order. In the following example, one or more of F, G, and/or H must be selected:

  ||F | G | H||

1.4 Supporting Software Levels

Any supported level of the following Unisys OS 2200 software products may be used for the installation and operation of I-QU PLUS-1:

ASCII COBOL
COMUS
ED
ELT
EXEC
MAP
MASM
PCIOS
PLUS
SORT
SSG
SYSLIB
UCSRTS
Or, any supported OS 2200 base release.

A number of issues may exist when using or interfacing with certain OS 2200 software. There is a discussion of these issues in Chapter 2, "Installation Guidelines". In addition, upcoming levels of software may require further considerations when running I-QU PLUS-1 Level 11. KMSYS Worldwide may issue additional release tapes or changes for Level 11 without reprinting this Installation Guide. Any changes and/or considerations after the publication of this document may be found in the first file (F0) of the release tape. Please read the element INFO/IQU11R6 prior to installing I-QU PLUS-1. The INFO/IQU11R6 element will be displayed (REGISTER,S) or @SYMed by COMUS during product registration.

Any currently supported levels of the following optional Unisys OS 2200 software products are only required for the installation and operation of I-QU PLUS-1 if a particular file system interface is desired:

DMS 2200 Interface:	DMS 2200
DTM Interface:	BIS
RDMS 2200 Interface:	RDMS 2200
SFS 2200 Interface:	SFS 2200

For sites running DMS 2200, single-thread DMR relocatables are provided on the I-QU PLUS-1 release tape (by agreement with Unisys) and are included in the default installation of -QU PLUS-1. Please see Section 1.5, below, and Chapter 10, "DMS USERSGSs for Single-thread DMR," in this guide.

1.5 Release Tape Contents

The following files are included on the I-QU PLUS-1 release tape:

File	Description
0	This is the COMUS utility file.
1	This file contains all base symbolic elements and fixed relocatable elements needed to generate I-QU PLUS-1.
2	This file contains any runstreams used in non-COMUS system generation and configuration.
3	This is the I-QU PLUS-1 permanent change file in program file format. It is used to apply changes to the base symbolic elements in file 2.
4	This file is initially empty. It will contain the generated relocatables, PROCs and MAP symbolics output from the generation process.
5	This file contains an initial I-QU PLUS-1 configuration generated at KMSYS Worldwide (see Section 1.5, "Quick Installation"). It will contain the generated I-QU PLUS-1 absolute program elements. This file is loaded when the COMUS INSTALL runstream is executed.
6	This file contains various I-QU PLUS-1 program examples and utilities. These examples may be examined, used as is or modified. This file is included for informational purposes only and is loaded when the COMUS INSTALL runstream is executed.
7	This file contains the base symbolic elements of the I-QU PLUS-1 database reorganization components.
8	This file is initially empty. It will be used for the I-QU PLUS-1 generation print file, if the "print to file" option is selected in the COMUS BUILD.
9	This file like the print file, is empty on the release tape but will be cumulative from gen to gen at your site. This file will contain the updated symbolics of any elements processed during BUILDs at your site. These symbolics can be used for input to CULL/IACULL if you wish such output.
10	For stability and update releases, this file contains a summary of changes since the previous base release.
11-12	These files are COMUS support files.
13-15	These files contain the complete relocatables and DMU absolutes for three (different sizes) 8R3J single-thread DMRs. See Chapter 1:, "DMS USERSGSs for Single-thread DMR", in this guide for a complete description of these DMRs. Any of these files can be loaded into a cataloged file and used as input when generating an I-QU PLUS-1 for use in database reorganizations. Each DMR contains the "IGNORE SET" fix required for use with the SCHUTL utility program. These files are only contained on the original distribution tape from KMSYS Worldwide; i.e., COMUS does not copy them to the build output master tape.

File numbers shown are relative to the beginning of the I-QU PLUS-1 files on the release tape.

1.6 Quick Installation

The initial configuration contained on the distribution tape can be installed without requiring an I-QU PLUS-1 generation. This configuration is for an I-QU PLUS-1 with full database reorganization capabilities. The single-thread DMR used has almost all features turned on, has table space to accommodate very large schemas and can support both TIP and EXEC areas and schemas. This configuration should be usable at most DMS 2200 sites. A listing of the I-QU PLUS-1 and DMS 2200 parameters used in the default generation will be found in Chapter 9, "Pre-GENed I-QU PLUS-1 Parameters", and Chapter 10, "DMS USERSGSs for Single-thread DMR", respectively.

The initial configuration is made available by KMSYS Worldwide in order to provide our customers with a means of quickly installing and using I-QU PLUS-1 without requiring a detailed understanding of the I-QU PLUS-1 generation parameters. Once you become more familiar with the product, you may want to tailor the I-QU PLUS-1 generation to the particular needs of your site.

> If you require features in the single-thread environment such as user-written database procedures or user CALC routines, you must build the product as described in this manual.

The default installation can be accomplished using the COMUS INSTALL. The following procedures outline the steps necessary for quick installation with COMUS:

1. Register the release tape as shown in Section 3.2, "STEP-1: REGISTER I-QU PLUS-1".
2. Use the COMUS CONFIGURE to establish a configuration set as shown in Section 3.3, "STEP-2: CONFIGURE for BUILD/INSTALL".
3. Enter the product license information on the "I-QU PLUS-1 Product License Information" screen.

   Be sure to enter the parameter values exactly as shown on the "I-QU Product License Key Information" sheet included with the release tape.
4. On the I-QU PLUS-1 environment screen, "Environmental Parameters for I-QU PLUS-1 Build/Install", set the I-QU PLUS-1 IBANK NAMEs and BDIs to "NONE" (eight parameters).
5. Exit the configuration process with the COMUS "E" command.
6. Follow the COMUS INSTALL procedure outlined in Section 3.5, "STEP-4: COMUS INSTALL". The MODE parameter shown on the INSTALL example is not required if using the default installation.
7. Use the COMUS CONFIGURE to issue the PROCESS command as described in Section 3.6, "STEP-5: Dynamic Runtime CONFIGURE".
8. Verify the installation as shown in the Chapter 4, "Installation Verification Procedure".

The I-QU processor call should be @IQU if the default installation was used.

The I-QU processor installed is a program-banked collection, which includes a single-thread DMR. If a common banked version of I-QU PLUS-1 is desired, the COMUS BUILD and INSTALL procedures must be followed as illustrated in the remaining chapters of this installation guide.

Chapter 2: Installation Guidelines

The Installation Guidelines Chapter will provide important information to be considered prior to installing I-QU PLUS-1.

2.1 Common Banks

The I-QU PLUS-1 Processor(s) may be configured to use common IBANKs. Configuring an I-QU PLUS-1 Processor to use common IBANKs is recommended, as common IBANKS can be shared by all users of that configuration. Only Alternate File Common Banks (AFCBs) and program banks are supported for I-QU PLUS-1 installations.

2.2 Bank Naming and Bank Descriptor Indexes (BDIs)

If you specify AFCBs, you must enter the names of the I-QU PLUS-1 common banks during the configuration process prior to doing a COMUS BUILD. The name given must be different for each I-QU PLUS-1 common bank used. These bank names will be discussed shortly.

The bank descriptor indexes (BDIs) for the I-QU PLUS-1 banks must be entered in the configuration information if you have selected to use AFCBs. The BDIs to use must not be used by any other software currently installed on your system. The default BDIs were chosen from a range reserved for non-Unisys software and are not used by other KMSYS Worldwide software. To determine which BDIs are currently installed on your system, you may look at element:

SYS$*DATA$.CO$INSTALL$/COMUS$

Unisys has allocated 816 out of a possible 4095 BDIs for site selection: indexes 0400300 through 0400323; starting with 0400400, the first 012 indexes of every 0100 (e.g., 0400700 through 0400711) up through 0403111; indexes 0403200 through 0403777; and indexes 0405500 through 0405777.

Bank names and BDIs are entered via the configuration screens for "Environmental Parameters for I-QU PLUS-1 Generation" (see Section 3.3, "STEP-2: CONFIGURE for BUILD/INSTALL").

2.3 Multiple DMS/RDMS Access

In many sites, more than one DMS 2200 and/or RDMS 2200 installation may be in use. A single version of the I-QU PLUS-1 processor can link to a maximum of nine (9) different multi-thread DMS/RDMS installations and one single-thread DMR (collected with I-QU PLUS-1 and used for database reorganizations). Access to the multi-thread environment may be dynamically configured into I-QU PLUS-1 without having to regenerate the product.

The linking to a particular DMS installation is accomplished through the standard COBLNK and LINKER relocatable routines supplied with the DMS or through a common-banked COBLNK relocatable element, CBEP$$DMS. For DMS installations under the Universal Data System (UDS), only the common-banked COBLNK option is allowed. In addition, since UDS uses ALIAS processing when linking a schema to a particular application group, only the default application group need be configured in I-QU PLUS-1. For more information regarding multiple application groups, see Chapter 8, "MCB Considerations".

Linking to a particular RDMS installation is accomplished by specifying the EXEC application group name under which the RDMS application executes.

2.4 Single-thread vs. Multi-thread DMR

The I-QU PLUS-1 processor DMS 2200 interface can be used with either a multi-thread or single-thread DMR; however, the database reorganization commands of the I-QU PLUS-1 processor will only operate with a single-thread DMR.

The single-thread DMR requirement is based on the need to guarantee that the I-QU PLUS-1 processor has absolute control over the page buffer during certain database reorganization functions. This also guarantees that no other run unit will have access to the areas in the process of being reorganized.

Note: These areas must be downed in the multi-thread (production) DMR while being reorganized under the single-thread DMR.

Chapter 3: Installing I-QU PLUS-1

3.1 Using COMUS

COMUS is required to generate, install and configure I-QU PLUS-1. Please refer to your OS 2200 COMUS End User Reference Manual, 7830 7758, for general instructions on using COMUS.

COMUS help screens are available for all I-QU PLUS-1 parameters by typing a question mark (?) on any prompt.

In general, the COMUS method of I-QU PLUS-1 installation will require the following steps:

1. REGISTER the I-QU PLUS-1 release tape into the COMUS database.
2. Set up your local configuration parameters using the COMUS CONFIGURE command (don't issue a PROCESS command yet). The COMUS configure interface provides a simple "fill in" format to complete the configuration. On-line help is available for every configuration parameter.
3. Perform a product BUILD.
4. INSTALL I-QU PLUS-1.
5. Establish the runtime configuration using the COMUS CONFIGURE and PROCESS commands.

Many of the I-QU PLUS-1 parameters can be changed without the necessity of performing a BUILD and INSTALL. By using the runtime configuration step (see Section 3.6, "STEP-5: Dynamic Runtime CONFIGURE"), these parameters can be changed as often as necessary without incurring unnecessary downtime. Runtime parameters that may be changed dynamically in this release are:

DMS 2200 access
Data name inclusion on INVOKE
DMS 2200 rollback upon exit
D$WORK NTRX for large PA/IPA loads
Significant characters when specifying area/record/set names
Single-thread DMR access
Single-thread reorg features
Single-thread DMR release level
Single-thread default schema file
Single-thread default schema
Multi-thread DMR access (up to 9 DMRs may be configured)
Common-banked or Non-common-banked COBLNK file/elt/ver
LINKER file/elt/ver for non-common-banked COBLNKs
Default schema files
Default schema names
RDMS 2200 access

RDMS 2200 applications (up to 9 applications may be configured)
CBEP$$RSA file name
RDMS/RSA PLUS stack size
RSA workspace
RDMS 2200 rollback upon exit
RDMS 2200 step advance if no END_THREAD
BIS DTM access
EXEC/FCSS/TIPDMS direct I/O
User/account security lists for:
I-QU PLUS-1 utilities
DMS 2200 schemas
DMS 2200 subschemas
DMS 2200 schema files
DMS 2200 DMRs
Default DMR
PCIOS files
PCIOS file types
RDMS 2200 applications
BIS DTM queues
DIO commands
DIO file types
Application group names (up to 9 may be configured)
MCB CBEP$$MCB file names
SFS 2200 CBEP$$SFS file names
Record delivery area (RDA) size
Initial operating mode
Default printer site
Five alternate printer sites
Alphabetic character range
Default value for high-values
Default source/object library qualifier
Decimal point type (period or comma)

The dynamic runtime configuration parameters, listed above, are not used during the generation process.

All other I-QU PLUS-1 parameters are entered using the COMUS CONFIGURE feature prior to the BUILD (see Section 3.3, “STEP-2: CONFIGURE for BUILD/INSTALL”). Once the BUILD process has been completed, the parameters may not be changed again without performing another BUILD.

3.2 STEP-1: REGISTER I-QU PLUS-1

The first step in installing I-QU PLUS-1 is to register the I-QU PLUS-1 product release tape with your COMUS database. You may register I-QU PLUS-1 with an existing COMUS database, or use COINIT to create a separate COMUS database for I-QU PLUS-1. The following is an example of an I-QU PLUS-1 COMUS registration using a separate COMUS database that has already been initialized. User input is shown in boldface font.

```
▶@qual qkms                    .  Or your COMUS database qualifier
▶I:002333 QUAL complete.
▶@comus
▶COMUS 6R8D (060816 1323:09) 2007 Apr 18 Wed 1321:58
▶Copyright (c) 1995-2006 Unisys Corporation.
▶COMMAND ? ▶register,s reel=116000 product=iqu,11r6
▶DATABASE DOES NOT CONTAIN A KEYWORD DICTIONARY.  NO KEYWORDS INSERTED.
▶REGISTER PRODUCT 'IQU 11R6' - <Y>/N/E(END) ?   ▶Y
▶
▶************ PRODUCT INFO FOR 'IQU 11R6' ***************************
```

Because the "S" option was used on the REGISTER command, a series of screens containing current I-QU PLUS-1 installation information will be displayed. You should read this information carefully. Note: This same information is contained on the first file (F0) of the release tape in the element, "INFO/11R6" (the version name will change with each subsequent release level; e.g., 11R6A, 11R6B, etc.). Once you have browsed through the information pertaining to this release level, you should see the following:

```
▶******************** END INFO ************************************
▶HIT TRANSMIT TO CONTINUE OR T(TOP) ▶
▶@BRKPT PRINT$/122192095934  .
▶@SYM 122192095934.,,PR .
▶@CO$COS$PF.COMUS,ZT ,KMS
▶ TASK COMPLETED ************************
▶COMMAND ?   ▶exit
▶END COMUS
```

The print file above shows the COMUS registration process, and is of little use to the user. The responses shown above may vary at your site due to differences in your COMUS default settings or COMUS release level.

> The COMUS BUILD and CONFIGURE facility provides a significant, ease-of-use method for building and configuring I-QU PLUS-1. If at your site, the primary COMUS database is unavailable to the person(s) maintaining I-QU PLUS-1, you may choose to set up an alternate COMUS database to be used for I-QU PLUS-1 build and configuration activities. These functions will not generally require special privileges and will in no way interfere with the operations using the site's primary database.

3.3 STEP-2: CONFIGURE for BUILD/INSTALL

While portions of I-QU PLUS-1 can be configured dynamically after its installation, several parameters can only be set prior to building the product (see Section 3.4, "STEP-3: COMUS BUILD"). The COMUS CONFIGURE for I-QU PLUS-1 is used to create all BUILD parameters interactively. The following pages show the configuration screens containing the parameters, which must be set prior to performing a COMUS BUILD.

A detailed explanation of each parameter affecting the COMUS BUILD can be found by typing a question mark (?) over the first position of a particular parameter and transmitting.

3.3.1 Entering the CONFIGURE Menus

To begin setting up your product configuration under COMUS you must first enter the COMUS CONFIGURE command. The following is an example of executing the CONFIGURE command:

```
▶@qual qkms
▶I:002333 QUAL complete.
▶@comus
▶COMUS 6R8D (060816 1323:09) 2007 Apr 18 Wed 1321:58
▶Copyright (c) 1995-2006 Unisys Corporation.
▶COMMAND ?   ▶configure mode=update
```

At this point, COMUS should go into full-screen mode. If your terminal is not in full-screen mode, type "\SCR" and transmit. This command will give you full-screen capability if your terminal type supports full-screen operations (UTS compatible terminals).

In full-screen mode, COMUS will display the first configuration menu. However, if no user set names are present in the COMUS database, it will be necessary to create one by using one of the COMUS COPY commands shown below.

For a new configuration set with KMSYS Worldwide release level defaults for all parameters, create a set for the new I-QU PLUS-1 release level using the following command:

COPY PRODUCT=IQU LEVEL=11r6 TO=*your-set-name*

If the set name (your-set-name) already exists in the COMUS database and contains a previous configuration of I-QU PLUS-1, the previously configured parameter values will be replaced by the release defaults; i.e., any site-specific values must be re-entered (see the COPY MERGE command below).

For a new configuration set that retains existing (i.e., site specified) parameter values, create a set for the new I-QU PLUS-1 release level using the COPY MERGE command:

COPY MERGE FROM=*old-set-name* TO=*new-set-name* PRODUCT=IQU LEVEL=11r6

The COPY MERGE retains any settings of existing configuration parameters and establishes the default values for any new parameters. This command will allow you to migrate from one release level to another, without having to re-enter parameter values that were set for the previous release level.

The COPY MERGE command can also be used to provide another execution level of I-QU PLUS-1; e.g., 11R5 can be used for production while 11R6 is being examined. If a second execution level is desired, a separate installation mode must be used so that both versions of I-QU PLUS-1 can co-exist (see the MODE parameter illustrated in Section 3.5.2, "Performing the INSTALL").

When you are ready to put the new release level into production, you can use the COMUS COPY command to copy from the test configuration set to the production set and use the COMUS DELETE command to delete the test set. This procedure will require a reinstallation of I-QU PLUS-1 utilizing the production installation mode. In addition, the product file name on the "Basic I-QU PLUS-1 dynamic configuration parameters" screen should be changed back to the original product file name.

From the opening menu, select the user set you wish to configure. In this case, three I-QU PLUS-1 configuration sets exist for three different release levels. The set named IQU11R6 has been selected. Change any parameter values shown on the screens of this set and then use the COMUS BUILD command to generate a BUILD runstream. During the BUILD dialog, answer the configuration query with this configuration SET name and the BUILD will extract your parameter choices from the COMUS database and use them to tailor an I-QU PLUS-1 for your site's particular needs.

```
5

     Set Name(s)                    Select the set you wish to use.
   1 QLINK6R3
   2 IQU11R4
   3 QLINK6R5
   4 IQU11R5
   5 IQU11R6
   6 QLINK6R6
```

Next, selecting product IQU will cause the main I-QU PLUS-1 configuration menu to be displayed.

```
1

 Master Menu for Set=IQU11R6      Select the product you wish to configure
     PRODUCT       LEVEL        UPDATED
   1 IQU           11R6         *
```

3.3.2 I-QU PLUS-1 Main Configuration Menu

Configuration processing through COMUS replaces the usage of generation SGSs for configuring the I-QU PLUS-1 processor and utilities. While some I-QU PLUS-1 parameters are still generation dependent (COMUS BUILD), all configuration information is entered via COMUS configure screens. The BUILD process will extract the generation time configuration information from the COMUS database in order to tailor table sizes and other BUILD dependent information. Many I-QU PLUS-1 parameters are dynamically configurable and can be changed by the system administrator without requiring a reBUILD. The parameters in the default configuration set should provide a minimally functional I-QU PLUS-1. You can and should tailor this configuration to your site's requirements as you become familiar with the product.

```
1



                                                                SCREEN: MAIN
 This is the main menu for updating the configuration parameters for I-QU
 release 11R6 systems. You may view or modify the configuration information
 for the generation and the runtime changeable parameters. You may use COMUS
 commands such as PROCESS, EXIT, OMIT, BACK, MODE=UPDATE, and '?',  or
 enter a number to select from the following categories:

    1) I-QU Product License Information                    SCREEN: LICENSE
    2) Environmental Parameters for I-QU BUILD/INSTALL     SCREEN: ENVIRON
    3) Basic Parameters for I-QU Generation                SCREEN: BUILD
    4) DMS1100 Parameters for I-QU Generation              SCREEN: DMSBLD

       Configuration for ( SYS$LIB$*IQU )
    5) Basic I-QU Dynamic Configuration Parameters         SCREEN: BASIC
    6) Applic. Group, MCB & SFS Entrypoint Configuration   SCREEN: APPLGROUP
    7) Global Dynamic Parameters for DMS1100 Access        SCREEN: DMS
    8) DMR Names and Unique Information                    SCREEN: DMR1
    9) RSA/RDMS Application Names and Unique Information   SCREEN: RSA1
```

Normally, the first parameter values to enter are those required to validate operation of the software for the licensed computer system. Selection 1 will present the screen for "I-QU PLUS-1 Product License Information".

> Since a COMUS BUILD is required prior to processing the dynamic runtime configuration parameters (the COMUS CONFIGURE PROCESS command), the selections required for a BUILD (1 through 4) will be covered first in this guide.

A detailed explanation of each parameter affecting the COMUS BUILD can be found by typing a question mark (?) over the first position of a particular parameter and transmitting.

3.3.3 I-QU Product License Information

This information is used by I-QU PLUS-1 to validate operation of the software for the licensed computer system. You have received a unique product license key sheet for each computer system for which you have been licensed for this software package. Please contact KMSYS Worldwide if the product key information you have received does not agree with the hardware configuration, which you utilize for operation of this software package, or if you have any questions concerning the setup of this information. The entries in these fields MUST match the product license key information you received with the product unless you are advised otherwise by KMSYS Worldwide personnel.

```
display screen=environ

                                                          SCREEN: LICENSE
 These parameters define the computer system and conditions under which
 operation of this product is licensed by KMSystems. Enter the information
 EXACTLY as it is printed on the product key sheet which was included with
 your distribution tape. Please contact KMSystems if you have any questions
 concerning this information.

 SITE NAME
 1100/2200 SYSTEM TYPE
 SITE ID CONFIGURED IN THE EXEC
 LICENSE EXPIRATION (YYYY-MM-DD)              NONE
 I-QU PRODUCT SERIAL NUMBER                   1010999
 I-QU PRODUCT VALIDATION KEY
```

The DISPLAY command can be used to access the next screen if the screen name is known, or use the BACK command to return to the main menu.

The values entered on the product license screen are required for BUILD/INSTALL and runtime processing. If they are not entered exactly as shown on the product key sheet packaged in the release shipment, validation errors will occur. These errors may occur at any stage (generation, installation or execution). If an error occurs, first check the information entered on this screen against the product key sheet for correctness. If it appears to be correct, determine the system type and site-id of your system (as generated in the EXEC) by entering the following SSG runstream:

```
@SSG
SKEL
*DISPLAY 'SITE=([SYSTEM$,1,1,2]) SYSTEM TYPE = ([SYSTEM$,1,3,1])'
@EOF
@EOF
```

If you have taken the steps described above and are still unable to execute I-QU PLUS-1, please call KMSYS Worldwide for assistance.

If you need to BUILD I-QU PLUS-1 on a system other than the one licensed for operation, please refer to Chapter 11, "Installing I-QU PLUS-1 Across Systems".

3.3.4 Environmental Parameters for I-QU BUILD/INSTALL

The parameters on the following screens may only be changed with an I-QU PLUS-1 generation (BUILD). Their values are used to supply the generation process with the location of the permanent SGSs and relocatable files. They also provide the bank names, bank descriptor indexes (BDIs) and optional processor names used for installation.

Enter your choices for the parameter values shown on these screens, and then use the COMUS BUILD command to create a generation runstream and the COMUS INSTALL command to create an installation runstream. By entering the name of the COMUS configuration set during the BUILD and INSTALL dialogs, COMUS will extract your parameter choices from the COMUS database and use them to tailor an I-QU PLUS-1 for your site's particular needs.

```
+
Enter + or - to view continuations of this screen.
                                                          SCREEN: ENVIRON
 These parameters define information which can only be changed by an I-QU
 system generation. Enter a question mark (?) in any field and transmit for
 information on how to configure that parameter. Other generation parameters
 can be viewed with selections #3 and #4 from the main menu (use the BACK
 command). Other related parameters will be found on page two of this screen
 sequence.
 FILENAME OF MISC PARAMETERS FLT
 ELEMENT NAME OF MISC PARAMETERS
 OBJECT COMPUTER TYPE                          THIS SYSTEM
 USE COMMON BANKED SORT LIBRARY                THIS SYSTEM
 ACOB LIBRARY CBEP$$ACOB FILE                  THIS SYSTEM
 ACOB C$DML BANK TYPE                          THIS SYSTEM
 ACOB C$DML BANK SIZE                          THIS SYSTEM
 QWIZZ PRODUCT FILE                            NONE
 INSTALL NAME FOR I-QU PROGRAM
 INSTALL NAME FOR QINDEX PROG
 INSTALL NAME FOR PFIX PROG
 INSTALL NAME FOR PBLD PROG
 INSTALL NAME FOR SCHUTL PROG
 INSTALL NAME FOR QRYSCH PROG
```

Five of the generation parameters (those circled above) have a default value of "THIS SYSTEM". When set to "THIS SYSTEM", the generation process will automatically determine the operating environment for I-QU PLUS-1.

If you are migrating from an earlier release level and you used the COMUS COPY MERGE to retain the parameter settings of the earlier configuration set, you may set these parameters to "THIS SYSTEM" in order to simplify the generation process.

If you desire to use this automated feature, make sure that you do not have a permanent SGS that points to an ACOB library (e.g., INCLUDE or EXTRALIB) left over from a previous BUILD of I-QU PLUS-1. This permanent SGS may have been entered when the products defaults were defined during a previous COMUS BUILD session. You may view and/or reenter any permanent SGSs entered in this manner by using the "Q" option on the COMUS BUILD. Another place that permanent SGSs may reside is in the "MISC PARAMETERS" element, which may have been named on this same screen.

If you are building on one system to be installed on another system, you must ensure either that the configuration of these five parameters will not be different between the two systems, or you must explicitly fill in these parameters for the system on which I-QU PLUS-1 will execute.

The parameters, "FILENAME OF MISC PARAMETER ELT" and the "ELEMENT NAME OF MISC PARAMETERS", are used to point to the element containing the permanent SGSs that may be required for I-QU PLUS-1 generation. See Section 3.4.1, "Permanent SGSs". You must place these SGSs in this element prior to starting the I-QU PLUS-1 generation runstream.

The following screen is a continuation of the "ENVIRON" screen shown previously.

```
disp scr=build
 Enter + or - to view continuations of this screen.
                                                              SCREEN: ENVIR2
  These parameters define information which can only be changed by an I-QU
  system generation. Enter a question mark (?) in any field and transmit for
  information on how to configure that parameter. Other generation parameters
  can be viewed with selections #3 and #4 from the main menu (use the BACK
  command). Other related parameters will be found on page one of this screen
  sequence.
  I-QU EXECUTION COMMON IBANK NAME              IQUIBANK1
  I-QU EXECUTION COMMON IBANK BDI               0401100
  I-QU EDITING COMMON IBANK NAME                IQUIBANK2
  I-QU EDITING COMMON IBANK BDI                 0401101
  I-QU DMS I/F COMMON BANK NAME                 IQUIBANK3
  I-QU DMS I/F COMMON BANK BDI                  0401102
  I-QU FEATURE COMMON BANK NAME                 IQUIBANK4
  I-QU FEATURE COMMON BANK BDI                  0401103

  DTM PROC FILE
  DTM SCHDLR INTERFACE BDI                      0403133
  I-QU DBANK START ADDRESS                      0154000
  DB4 PRODUCT LIBRARY FILE                      NONE
```

The next section covers the basic parameters required to build I-QU PLUS-1. An abbreviated form of the DISPLAY command is used in this example to present the screen for the "Basic Parameters for I-QU PLUS-1 Generation."

3.3.5 Basic Parameters for I-QU Generation

These parameters must be changed with an I-QU PLUS-1 system generation (BUILD). Their values are used to determine the amount of table space required for I-QU PLUS-1.

```
disp scr=dmsbld

                                                              SCREEN: BUILD
 These parameters define information which can only be changed by an I-QU
 system generation. Enter a question mark (?) in any field and transmit for
 information on how to configure that parameter. DMS1100 related parameters
 can be viewed with selection #2 from the main menu (use the BACK command).


 MAX VARIABLE NAMES                          100
 DATA STORAGE AREA (DOUBLE WORDS)            400
 PROGRAM STORAGE SIZE (COMMANDS)             200
 MAXIMUM LABELS IN A PROGRAM                 205
 MAXIMUM FILES (DEF F DIRECTIVES)            10
```

Following this section are the DMS 2200 related parameters required for the I-QU PLUS-1 BUILD. An abbreviated form of the DISPLAY command is used to present the screen containing the "DMS2200 Parameters for I-QU Generation".

3.3.6 DMS2200 Parameters for I-QU Generation

These parameters may only be changed with an I-QU PLUS-1 generation (BUILD). Their values are used to provide the generation process with the location of DMS 2200 relocatable elements used to include DMS CALC simulation routines, a single-thread DMR and user-written program-banked database procedures for the single-thread DMR interface.

```
e

                                                                SCREEN: DMSBLD
These parameters define information which can only be changed by an I-QU
system generation. Enter a question mark (?) in any field and transmit for
information on how to configure that parameter.


DMS1100 CALC ROUTINE(S) FILE
DMSCALC SIMULATION                          TRUE
RANDENTIAL SIMULATION                       TRUE

GENERATE SINGLE-THREAD DMR                  FALSE
SINGLE-THREAD DMS FILE
SINGLE-THREAD COBLNK FILE
SINGLE-THREAD LINKER FILE
SINGLE-THREAD LINKER ELT/VERSION
SINGLE-THREAD PROG BANK DBP(S)              FALSE
SINGLE-THREAD DBP CONFIG SOURCE
```

Three single-thread DMR relocatable files (for a small, medium or large DMR) are included on the I-QU PLUS-1 release tape by agreement with Unisys. One of these files (see Section 1.4, "Release Tape Contents") may be copied to mass storage and configured on this screen for inclusion during I-QU PLUS-1 collection.

Once all of the parameters required for an I-QU PLUS-1 build have been entered, the COMUS "E" command can be used to terminate the COMUS configuration process in preparation for performing the COMUS BUILD. Note: the EXIT command will terminate the COMUS session.

3.4 STEP-3: COMUS BUILD

Once I-QU PLUS-1 is registered with COMUS, you may proceed with the BUILD process. This process will generate I-QU PLUS-1 for installation in your environment. Before beginning the COMUS BUILD, you will need to create your local I-QU PLUS-1 configuration SGSs that will be requested during the COMUS BUILD. These SGSs are described below.

3.4.1 Permanent SGSs

The first group of SGSs defines the default processors and libraries to be used in the generation. These SGSs should be placed in the miscellaneous parameters element described earlier in this chapter (see Section 3.3.4, "Environmental Parameters for I-QU Build/Install"). Alternately, they could be supplied as permanent SGSs when COMUS queries for the permanent SGSs during the BUILD process. The defaults for the processor SGSs are:

```
CO$ACOBPROCESSOR CALL NAME IS ''ACOB'' ;
            OPTIONS ARE ''CES'' ;
            LIBRARY FILE IS ''SYS$LIB$*ACOB''
CO$EDPROCESSOR CALL NAME IS ''ED'' ;
            OPTIONS ARE ''N''
CO$ELTPROCESSOR CALL NAME IS ''ELT'' ;
            OPTIONS ARE ''LV''
CO$MAPPROCESSOR CALL NAME IS ''MAP'' ;
            OPTIONS ARE ''S''
CO$MASMPROCESSOR CALL NAME IS ''MASM'' ;
            OPTIONS ARE ''SEVY''
CO$PDPPROCESSOR CALL NAME IS ''PDP'' ;
            OPTIONS ARE ''L''
CO$PLSPROCESSOR CALL NAME IS ''PLS'' ;
            OPTIONS ARE ''SEF'' ;
            LIBRARY FILE IS ''SYS$LIB$*PLS''
CO$SSGPROCESSOR CALL NAME IS ''SSG''
CO$TCONPROCESSOR CALL NAME IS ''NOT''
CO$DCONPROCESSOR CALL NAME IS ''NOT''
CO$MCONPROCESSOR CALL NAME IS ''NOT''
CO$SORTPROCESSOR CALL NAME IS ''NONE'' ;
            OPTIONS ARE ''NONE'' ;
            LIBRARY FILE IS ''SYS$LIB$*SORT''
CO$SRTPROCESSOR CALL NAME IS ''NONE'' ;
            OPTIONS ARE ''NONE'' ;
            LIBRARY NAME IS ''SYS$*SRT$PAR''
CO$TIPPROCESSOR CALL NAME IS ;
            ''TIP$*TIPRUN$.SUPUR'' ;
            OPTIONS ARE ''NONE''
CO$PCIOSPROCESSOR CALL NAME IS ''NONE'' ;
            OPTIONS ARE ''NONE''
CO$SYSLIBPROCESSOR CALL NAME IS ''NONE'' ;
            OPTIONS ARE ''NONE'' ;
            LIBRARY FILE IS ;
            ''SYS$LIB$*SYSLIB''
CO$UCSRTSPROCESSOR CALL NAME IS ''NONE'' ;
            OPTIONS ARE ''NONE'' ;
            LIBRARY FILE IS ;
            ''SYS$LIB$*UCSRTS''
```

If these are not correct for your system, add permanent SGSs to your COMUS BUILD parameters to specify the correct files. Replace only those SGSs that must be different at your site.

Before continuing, please refer to Chapter 8, "MCB Considerations."

There are many different ways to install the ACOB processor and library at a given site which can affect the way I-QU PLUS-1 is installed. Please refer to Chapter 7, "ACOB Library Considerations," before continuing.

ACOB "extra options" can be specified by placing them in the second sub-field of the "OPTIONS ARE xxxx" clause, e.g., "OPTIONS ARE CES,NR".

If your site uses the ACOB "flagging" compiler (Unisys COBOL extensions are disabled), the "N" and "R" extra options must be specified in order to compile the I-QU PLUS-1 programs.

The CO$SRTPROCESSOR is only used if you are not using common banked SORT libraries.

I-QU PLUS-1 uses GSA for its input parsing and message generation. It is not necessary to have GSA installed for I-QU PLUS-1 configuration and operation. If you have GSA level 5R1 installed and you must reprocess the GSA source modules used within I-QU PLUS-1, the CO$xCONPROCESSOR SGSs must define the location of the TCON, MCON and DCON processors. Only 5R1 may be used. An attempt to use any other level will cause severe errors. In addition, the 'LIB FILE IS' clause on the CO$TCONPROCESSOR SGS must specify the file containing the updated source to the GSA library routines (normally GSA is installed in SYSLIB*GSA).

If your libraries are installed in a non-standard manner and you require additional libraries to be searched and properly included in the I-QU PLUS-1 collections, use the EXTRALIB SGS:

EXTRALIB || *qual-1*file-1* | *qual-2*file-2* | … *qual-n*file*n* ||

The INCLUDE SGS provides the means for including specific elements in the I-QU PLUS-1 collections. This SGS is normally only used to include elements such as CERU$ (pre-COMUS libraries) or CBEP$$xxxx elements.

INCLUDE || *qual-1*file-1*,*elt-1* | *qual-2*file-2*,*elt-2* | … *qual-n*file-n*,*elt-n* ||

There may be only one INCLUDE SGS used in an I-QU PLUS-1 generation. If multiple elements are to be included, you may continue this SGS on a new line by using the semicolon (;) continuation character as in the following example:

```
INCLUDE QUAL*PF,ELT1 ;
        QUAL*PF,ELT2
```

The NOT SGS allows the exclusion of elements which may be in your default library search path from the I-QU PLUS-1 collections. As with the INCLUDE SGS, there may be only one NOT SGS used in an I-QU PLUS-1 generation. If multiple elements are to be excluded, you may continue this SGS on a new line by using the semicolon (;) continuation character as illustrated in the previous example.

NOT || [*qual-1*file-1,*]*elt-1* | [*qual-2*file-2,*]*elt-2* | … [*qual-n*file-n,*]*elt-n* ||

If you wish to alter the listing and extra options fields of the CO$xyzPROCESSOR SGSs, you may override both these fields by listing the processor type on an USEOPT SGS. Additionally, options for the @HDG statement may be specified here:

USEOPT || *processor-name-1,options-1,extra-options-1* | ;
processor-name-2,options-2,extra-options-2 | ;
… *processor-name-n,options-n,extra-options-n* ||

For example:

```
USEOPT ACOB,CES,K ELT,N MAP MASM,E PDP
```

3.4.2 Database Procedure SGSs

The DBP SGS is required only when generating the I-QU PLUS-1 processor for use with a single-thread DMR which will use database procedures (DBPs). This SGS is used to specify parameters necessary in the creation of the BDI list, bank definition elements, and MAP directives to be used in the generation of I-QU PLUS-1 with program banked DBPs. The generation procedure will follow the conventions documented in the DMS 2200 System Support Functions manual. The DBP SGSs must be placed in the file and element specified on the SINGLE-THREAD DBP CONFIG SOURCE parameter found on the DMSBLD screen (see Section 3.3.6, "DMS 2200 Related Parameters for I-QU PLUS-1 Generation").

Format:

DBP *transfer-area-size* {COBOL | MASM} *DBP-relocatable-file* ;
{*DBP-library-1* … [*DBP-library-n*] | NONE} ;
IBANK-relocatable-elt[,*DBANK-relocatable-elt*] ;
IBANK-name,DBANK-name ;
|| *DBP-name-1,entry-point-1* | ;
DBP-name-2,entry-point-2 | ;
… *DBP-name-n,entry-point-n* ||

The semicolon (;) is a continuation symbol and is only required when the DBP SGS will not fit on one line.

> There must be one DBP SGS for each DBP bank to be included.

The *DBP-library* must contain either a library name(s) or the literal "NONE". Specify a library name(s) only if the DBP is COBOL (these should be the COBOL relocatable runtime libraries).

The *DBANK-relocatable-elt* is only allowed for COBOL DBPs.

> The DMS 2200 database procedure implementation scheme does **not** allow the use of common-banked COBOL relocatable runtime libraries with database procedures functioning in the single-thread DMR environment.

DBP SGS Examples:

In this example, two DBP IBANKS and two DBP DBANKS will be generated. The first will be for a COBOL DBP containing two CALC routines. The second will be an access control DBP written in MASM.

```
DBP   100   COBOL   DBP*REL-FILE ;
    SYS$LIB$*ACOB6R2C,TIP$*TIPLIB$,SYS$LIB$*UCSRTS ;
      CALRTN,CALRTNSYSDTA DBPIB1,DBPDB1 ;
```

```
          CALC-1,CALC1 CALC-2,CALC2

DBP   1000  MASM    DBP*REL-FILE ;
    NONE ;
      ACCESSC1   DBPIB2,DBPDB2 ;
        ACCTL-A,ACCTL
```

Before accessing any schema that specifies database procedures through an I-QU PLUS-1 processor generated with program-banked DBPs, the schema absolute must be modified using the DBPGEN program supplied with DMS 2200. A runstream will automatically be generated and placed in the I-QU PLUS-1 product file (default, SYSLIB*IQU.) at installation time. The element name is DBPGEN. The values inserted into the runstream are dependent upon the values entered on the DPB SGSs.

This runstream should be copied to a file and modified with the names of the input schema file, output schema file, input schema and output schema. The names to be modified are enclosed in angled brackets (<<< >>>) as shown in the example, below.

The runstream should always be run against a fresh copy of the schema absolute; i.e., one not altered by any other DBPGEN.

The following runstream will be automatically generated by including the above DBP SGSs:

```
@RUN,D DBPGEN,,DBPGEN
@.
@.  This is an example DBPGEN run customized for this I-QU build configuration.
@.  For each schema which you wish to process you must update this runstream
@.  with the schemafile names (2 places) and the schema absolute element
@.  name (2 places).  It must be run on a 'fresh' copy of the schema (i.e., one
@.  which has never been DBPGEN'd before.  You must then use the modified
@.  schema when INVOKE'ing for the single-thread DMR.
@.
@ASG,A QKMS*DMSSTLIB .  NEED DBPGEN RELOCATABLE FROM DMS FILE #4
@MAP ,DBPGEN
  IN QKMS*DMSSTLIB.DBPGEN
  EQU BDILIST/0
  END
@USE SCHIN.,<<<<INPUT*SCHEMAFILE>>>>
@USE SCHOUT.,<<<<OUTPUT*SCHEMAFILE>>>>
@ASG,A SCHIN.
@ASG,A SCHOUT.
@XQT DBPGEN
PROGRAM                   <— Indicates DBPs are program banked
<<<<SCHEMA-NAME>>>>       <— Input schema name
<<<<SCHEMA-NAME>>>>       <— Output schema name
*DBPBANK*,DBPDB1,DBPIB1   <— COBOL DBP bank names (above)
CALC-1,COBOL              <— 1st DBP name and language
CALC-2,COBOL              <— 2nd DBP name and language
*ENDBANK
*DBPBANK*,DBPDB2,DBPIB2   <— MASM DBP bank names (above)
ACCTL-A,MASM              <— DBP name and language
*ENDBANK
@FIN
```

3.4.3 Performing the BUILD

Once any additional SGSs have been set up, you may use the COMUS BUILD to generate I-QU PLUS-1. The output of the BUILD will be a product master tape ready to be installed. An example of a first-time I-QU PLUS-1 COMUS BUILD session follows:

```
▶@qual qkms
▶I:002333 QUAL complete.
▶@comus
▶COMUS 6R8D (060816 1323:09) 2007 Apr 18 Wed 1321:58
▶Copyright (c) 1995-2006 Unisys Corporation.
▶COMMAND ?   ▶build iqu,11r6,
```

The following portion of the COMUS session will be used to set the product build defaults for I-QU PLUS-1. You will only be prompted for the defaults the first time the product is built. On subsequent builds, COMUS will skip this section.

```
▶For each default question you may enter one of the following
▶responses:
▶  1. An appropriate value.
▶  2. A null string or spaces will maintain the current default value.
▶  3. QUERY - This keyword causes COMUS to ask for the default on
▶     every BUILD of the product.
▶  4. BLANK - This keyword sets the value of the default to null.
▶
▶Default project id (<Q$Q$Q$>) ? ▶iqums
▶Default run id (<>) ? ▶iqugen
▶Default run options (<>) ? ▶
▶Default run priority (<>) ? ▶d
▶Default tape equipment type (<T>) ? ▶u9s
▶Default tape assign options (<TF>) ? ▶tj
▶Default generation type (DISK/DISK or <TAPE/TAPE>) ? ▶
▶Permanent SGSs (<END>) ? ▶
▶Printout: file, printer or query - F/P/<Q> ? ▶q
▶Defaults Complete
```

This part of the COMUS session will occur on all builds.

```
▶Project id for this generation (<iqugen>) ? ▶
▶Run id for this generation (<iqugen>) ? ▶
▶MASTER - reel/file./<> ? ▶116000
▶Generation id ? ▶iqu11r6
▶
▶Generation heading (<>) ? ▶I-QU PLUS-1 Full Generation
▶
▶Generation reason (<END>) ? ▶New Generation for Release 11r6
▶Generation reason (<END>) ? ▶
▶
▶New change number (<END>) ? ▶
▶
▶Perform ALL, FULL, CONFIG or MAPONLY gen - A/<F>/C/M ? ▶
▶NEWMASTER - reel/file./<> ? ▶newiqu
▶Printout to file or printer - <F>/P ? ▶f
▶Additional SGSs (<END>) ? ▶
▶What is the IQU configuration set name? ▶iqu11r6
```

At the above prompt, you should use the configuration set (named in STEP-2) containing your I-QU PLUS-1 configuration parameters (see Section 3.3.1, "Entering the CONFIGURE Menus").

```
▶The runstream has been saved in 'QKMS*COMRUN(1).1/IQU11R6'
▶View the runstream (Y or <N>) ? ▶
```

```
▶Print a copy of the runstream (Y or <N>) ? ▶
▶Start the runstream (Y or <N>) ? ▶y
▶The runstream has been saved in 'QKMS*COMRUN(1).1/IQU11R6'
▶UPDATING ACCESS FILES ...
▶ACCESS FILES HAVE BEEN UPDATED
▶BUILD TASK COMPLETED ************************
▶COMMAND ?   ▶exit
▶END COMUS
```

If KMSYS Worldwide supplied changes have been inserted into the COMUS database (see Chapter 12, "Applying Changes to I-QU PLUS-1", in this guide), the change number(s) would be entered at the "New Change Number" prompt above. Normally, when you receive a release tape, there will be no changes to enter.

You must always perform a FULL or ALL generation type the first time the BUILD is run. The FULL or ALL generation will create the processors. Subsequent CONFIG generations should then be used to configure the I-QU PLUS-1 processor with various features. The MAPONLY generation can be used to change the banking or library structure defined when I-QU PLUS-1 is mapped.

If a MASM level earlier than 5R1 is used for I-QU PLUS-1 installation, a gen type of ALL must be done when the KMSYS Worldwide release tape is used as input to the gen.

The ALL forces the reprocessing of all elements, whether or not it is necessary, and should be used if you require full listings of all components generated.

The FULL generation causes all components of I-QU PLUS-1 to be generated. This includes the I-QU PLUS-1 processor, all I-QU PLUS-1 common banks and QINDEX. Also, QRYSCH, SCHUTL, PBLD and PFIX will be generated if reorganization features are turned on.

The MAPONLY type specifies that only the collection of the I-QU PLUS-1 processors will be performed and the associated elements in the F5 file will be generated. MAPONLY may be specified to change the names of AFCB IBANKs, or other portions of the I-QU PLUS-1 processor MAPs. This type must not be used in your first I-QU PLUS-1 generation.

It is normal to receive duplicate entry-point warning messages from the Collector when processing the I-QU PLUS-1 maps for AFCB configurations; however, there should be zero ERRORs in all I-QU PLUS-1 processor maps. The number of warnings in the main I-QU PLUS-1 collection will equal the sum of the warnings in the IBANK-1, IBANK-2, IBANK-3 and IBANK-4 collections.

3.5 STEP-4: COMUS INSTALL

Once you have performed the I-QU PLUS-1 product build, you can use COMUS to install the various components of the system. The install process will install the I-QU PLUS-1 common banks, the executable I-QU PLUS-1 absolutes and required I-QU PLUS-1 runstreams. The following files and components will be installed:

3.5.1 The Product Files

SYSLIB*IQU.	This file name will match the MODE parameter on the INSTALL command. The allowable modes are IQU (the default), IQUA, ... IQUK. The file will contain all the executable processors, elements required for runtime configuration and all generated I-QU PLUS-1 processor alternate file common bank (AFCB) I-BANKs.
SYSLIB*IQU-1	This file (also dependent upon the MODE parameter on the INSTALL command) contains I-QU PLUS-1 System example request programs and utilities. It is provided for information and may be used for installation verification (see Chapter 4, "Installation Verification").

Processors found in SYSLIB*IQU:

IQU	Processor and, optionally, the four AFCB I-Banks.
QINDEX	Creates/updates/lists data item index files containing item definitions from schemas, subschemas and COBOL COPY proc formatted elements.
QRYSCH	Accesses and displays information contained within tables in the object schema.
SCHUTL	Performs modifications to an object schema and subschema to reduce overhead when loading database areas.
PBLD	Builds and orders database pointer cross-reference file(s) for use by the PFIX processor.
PFIX	Re-links set relationships, de-links owners from set chains and globally changes database pointer/key format and/or area codes.

The default names given to each of the six processors mentioned above are dependent upon the "INSTALL NAME FOR ..." configuration parameters (see Section 3.3.4, "Environmental Parameters for I-QU Build/Install") and the MODE parameter on the COMUS INSTALL command (retrieve the COMUS SRL listing for the default processor names).

Other components found in SYSLIB*IQU:

IQU$CFIG	I-QU PLUS-1 runtime configuration (built by the COMUS CONFIGURE PROCESS).
DBPGEN	Runstream automatically generated based on the values set for the DBP SGSs. This runstream may be used to link user written DBPs to a schema used in a single-thread environment.
CFIGSKEL	Element used in runtime configuration.
IQUCFIG	Element used in runtime configuration.
CO$CONFIG	Element that contains the generation and installation SGSs which produce this I-QU PLUS-1 (used by CONFIGURE).
KMSLEV	Element contains the KMSYS Worldwide release level id and serial number for your copy of I-QU PLUS-1.

IQU$DTM	BIS run that must be registered with BIS if the optional DTM interface is configured.

The INSTALL runstream must be run (@START) under either the site security officer's user-id or a user-id which has been granted the necessary privileges for installation. For further information, see the COMUS End Use Reference Manual, 7830 7758.

If installing multiple versions of I-QU PLUS-1, you must use the MODE parameter on the second and subsequent INSTALL command specifying a mode name which is not currently installed at your site; otherwise, the first install will be overlaid. The mode name chosen will be used as part of the I-QU PLUS-1 product file names. For example, if MODE=IQUB, product files SYSLIB*IQUB and SYSLIB*IQUB-1 would be produced. In addition, the mode is used to generate the installed program names when not specifically named in the configuration parameters. If MODE=IQUB, the following six processors would be produced: IQUB, IQNDXB, QYSCHB, SCHUTB, PBLDB and PFIXB.

Please view the COMUS System Registration Log (SRL) before using the MODE parameter.

3.5.2 Performing the INSTALL

An example of the COMUS INSTALL session follows:

```
▶@qual qkms
▶I:002333 QUAL complete.
▶@comus
▶COMUS 6R8D (060816 1323:09) 2007 Apr 18 Wed 1321:58
▶Copyright (c) 1995-2006 Unisys Corporation.
▶COMMAND ?   ▶install product=iqu,11r6 reel=newiqu mode=iquc
```

Note: If you receive a stability release of I-QU PLUS-1, enter the complete stability level (11R6A, 11R6B, etc.) on the COMUS INSTALL.

In the example, shown previously, an alternate installation mode (IQUC) was used. An alternate mode should be used to avoid overlaying an existing installation of I-QU PLUS-1; e.g., a previous release level to be maintained until the new level is placed into production. Also, when a second installation mode is used in this manner, be sure that the BDIs, bank names and installed processor names are unique.

The following portion of the COMUS session will be used to set the product install defaults for I-QU PLUS-1. You will only be prompted for the defaults the first time any product is installed. On subsequent installs, COMUS will skip this section.

```
▶For each default question you may enter one of the following
▶responses:
▶  1. An appropriate value.
▶  2. A null string or spaces will maintain the current default value.
▶  3. QUERY - This keyword causes COMUS to ask for the default on
▶     every INSTALL of the product.
▶  4. BLANK - This keyword sets the value of the default to null.
▶
▶Enter the default tape equipment type - <T> ▶u9s
▶Enter the default tape assign options - <TJ> ▶
▶Enter the default project id - <> ▶qkms
▶Enter the default runid - <> ▶iquin
▶Enter the default run options - <> ▶
▶Enter the default run priority - <> ▶a
▶Enter any permanent SGS's for product IQU 11R6
▶SGS or <END> ▶
```

This part of the COMUS session will occur on all installs. Remember, you can get more information on any prompt by simply transmitting a question mark (?).

```
▶Enter the project id for this installation - <QKMS> ▶
▶Enter reason for installation of IQU 11R6
▶Reason or <END> ▶I-QU PLUS-1 11R6 Installation
▶Reason or <END> ▶
▶Enter any additional SGS's for IQU 11R6
▶SGS or <END> ▶
▶What is the I-QU PLUS-1 configuration set name? ▶iqu11r6
▶The runstream has been saved in 'QKMS*COMRUN(1).INS-16'
▶View the runstream - Y/<N> ? ▶
▶Print a copy of the runstream - Y/<N> ? ▶
▶Start the runstream - <Y>/N ? ▶y
▶The runstream has been saved in 'QKMS*COMRUN(1).INS-16'
▶INSTALL TASK COMPLETED ************************
▶COMMAND ?   ▶exit
▶END COMUS
```

3.6 STEP-5: Dynamic Runtime CONFIGURE

In this step, you will be configuring the runtime attributes of I-QU PLUS-1. You may use this process whenever you wish to change I-QU PLUS-1's runtime parameters. Under the COMUS configuration described here, most runtime configuration changes will take effect immediately.

To perform dynamic configuration, enter COMUS and use the CONFIGURE command as in STEP-2. Adjust the dynamic configuration parameters as necessary, and then enter the PROCESS command from any screen within the configuration set. COMUS will then go into scrolling screen mode and perform the configure routines.

> The COMUS PROCESS command cannot be issued until the I-QU PLUS-1 product file has been installed by the installation runstream (see Section 3.5, "STEP-4: COMUS INSTALL").

The following is an example of executing the COMUS CONFIGURE command.

```
▶@qual qkms
▶I:002333 QUAL complete.
▶@comus
▶COMUS 6R8D (060816 1323:09) 2007 Apr 18 Wed 1321:58
▶Copyright (c) 1995-2006 Unisys Corporation.
▶COMMAND ?   ▶config set=iqu11r6 product=iqu level=11r6 mode=update
```

Since the set and product names were supplied on the CONFIGURE command, COMUS will bypass the set and product selection screens.

The following pages will show each screen for the dynamic runtime configuration parameters. A detailed explanation of each parameter can be found by typing a question mark (?) over the first position of a particular parameter and transmitting.

```
5

                                                                SCREEN: MAIN
 This is the main menu for updating the configuration parameters for I-QU
 release 11R6 systems. You may view or modify the configuration information
 for the generation and the runtime changeable parameters. You may use COMUS
 commands such as PROCESS, EXIT, OMIT, BACK, MODE=UPDATE, and '?',  or
 enter a number to select from the following categories:

    1) I-QU Product License Information                    SCREEN: LICENSE
    2) Environmental Parameters for I-QU BUILD/INSTALL     SCREEN: ENVIRON
    3) Basic Parameters for I-QU Generation                SCREEN: BUILD
    4) DMS1100 Parameters for I-QU Generation              SCREEN: DMSBLD

       Configuration for ( SYS$LIB$*IQU )
    5) Basic I-QU Dynamic Configuration Parameters         SCREEN: BASIC
    6) Applic. Group, MCB & SFS Entrypoint Configuration   SCREEN: APPLGROUP
    7) Global Dynamic Parameters for DMS1100 Access        SCREEN: DMS
    8) DMR Names and Unique Information                    SCREEN: DMR1
    9) RSA/RDMS Application Names and Unique Information   SCREEN: RSA1
```

3.6.1 Basic I-QU Dynamic Configuration Parameters

The following parameters can be changed without requiring an I-QU PLUS-1 generation or installation. The values are used to turn ON/OFF interface access code, link to the security access element, establish printer queues, etc.

When you tell COMUS to PROCESS the configuration set, it will write the configuration to the specified product installation file (as specified on the IQUBASIC screen) and subsequent I-QU PLUS-1 program executions will utilize the new parameters. If the MODE parameter was used on the COMUS INSTALL, the INSTALLATION FILE name must be changed to match the mode used before doing the PROCESS.

```
+
 Enter + or - to view continuations of this screen.
                                                                SCREEN: BASIC
  These parameters define information which can be changed without requiring
  a system generation (BUILD) of I-QU. Enter a question mark (?) in any field
  and transmit for information on how to configure that parameter. You can
  display other screens in this sequence by transmitting + or - at the home
  position.

  INSTALLATION FILE                          SYS$LIB$*IQU
  QWIZZ INTERFACE                            OFF
  EXEC/FCSS/TIPDMS DIRECT I/O                ON
  RDMS 1100 INTERFACE                        OFF
  DTM INTERFACE                              OFF
  INITIAL CONVERSATION MODE                  TRUE
  I-QU LIBRARY QUALIFIER                     I$QU
  DEFAULT PRINTER DEVICE/QUEUE               PR
  ALT PRINTER DEVICE/QUEUE #1                PR
  ALT PRINTER DEVICE/QUEUE #2                PR
  ALT PRINTER DEVICE/QUEUE #3                PR
  ALT PRINTER DEVICE/QUEUE #4                PR
  SECURITY BY USERID/ACCOUNT/NONE            NONE
  SECURITY ACCESS LIST SOURCE
  PRIVILEGED FUNCTION PASSWORD               IQUP
```

If the SECURITY BY USERID/NONE parameter is set to “USERID”, all access features (utilities, PCIOS files, DMRs, etc.) required by a site must be configured or access will be denied. Chapter 5, “Security”, of this guide explains how to configure the security SGSs to be placed in the element and file specified on the SECURITY ACCESS LIST SOURCE parameter.

The following is the continuation screen for the basic configuration parameters.

```
display screen=applgroup
 Enter + or - to view continuations of this screen.
                                                              SCREEN: BASIC1
  These parameters define information which can be changed without requiring
  a system generation (BUILD) of I-QU. Enter a question mark (?) in any field
  and transmit for information on how to configure that parameter. You can
  view other screens in this sequence by transmitting + or - at the home
  position.

  RECORD DELIVERY AREA (WORD SIZE)            4000

  STANDARD/ALT HIVALS (0177/0377)             0177
  SPECIAL CHARS TREATED AS ALPHA
  EUROPEAN DECIMAL FORMAT                     FALSE
  DB4 DATABASE ACCESS                         OFF
```

The characters included in $ALPHA are selected with a bit map containing all alpha characters. The I-QU PLUS-1 administrator can add/delete up to 32 special alpha characters. The default $ALPHA definition now includes A..Z (FIELDATA or ASCII), SPACE and a...z (ASCII only).

3.6.2 Application Group, MCB and SFS Entry Point Configuration

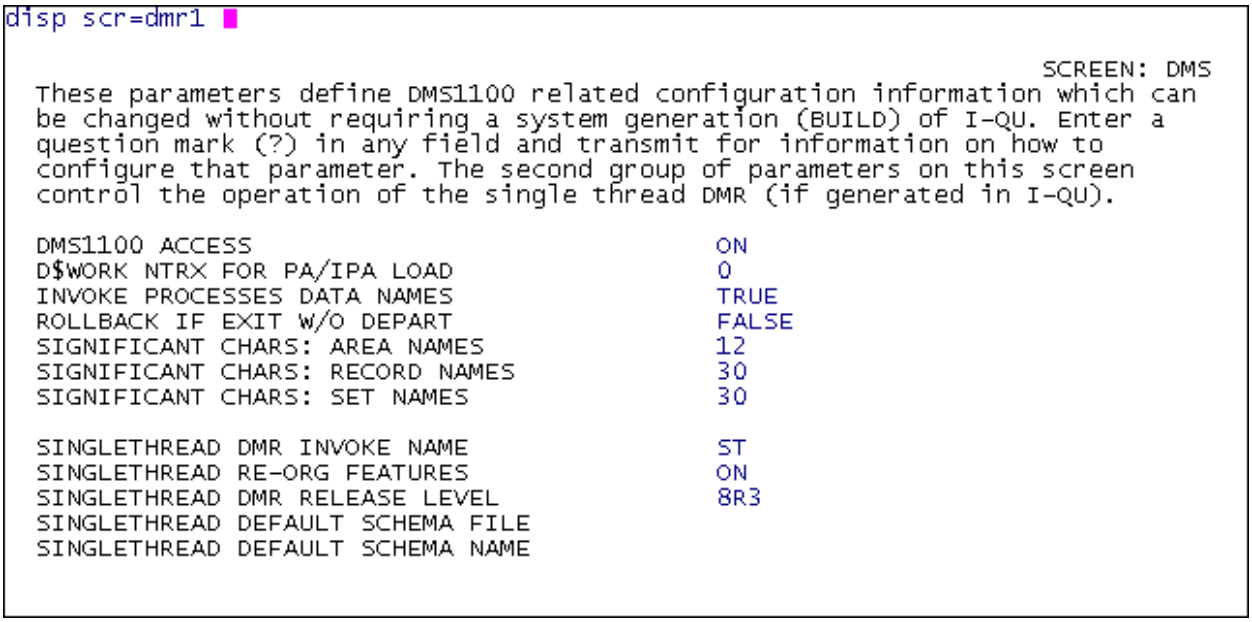
The following parameters can be changed without requiring an I-QU PLUS-1 generation or installation. The APPLGROUP screen and its extension screen, APPLGROUPEXT, contain the information required to configure I-QU PLUS-1 for Step Control Application Groups, MCB entrypoints and SFS 2200 entry points.

```
+
 Enter + or - to view continuations of this screen.
                                                          TITLE: APPLGROUP
  These parameters relate Stepcontrol Application Group names, number MCB
  and SFS entrypoints.  These parameters can be changed without requiring a
  system generation (BUILD) of I-QU.  Enter a question mark (?) in any
  field and transmit for information on how to configure that parameter.



  Name of Application Group 1
  Name of MCB CBEP$$MCB1 file
  Name of SFS CBEP$$SFS1 file
  Name of Application Group 2
  Name of MCB CBEP$$MCB2 file
  Name of SFS CBEP$$SFS2 file
  Name of Application Group 3
  Name of MCB CBEP$$MCB3 file
  Name of SFS CBEP$$SFS3 file
  Name of Application Group 4
  Name of MCB CBEP$$MCB4 file
  Name of SFS CBEP$$SFS4 file
```

```
disp src=dms
 Enter + or - to view continuations of this screen.
                                                       SCREEN: APPLGROUPEXT
  These parameters relate Stepcontrol Application Group names, number, MCB
  and SFS entrypoints.  These parameters can be changed without requiring a
  system generation (BUILD) of I-QU.  Enter a question mark (?) in any
  field and transmit for information on how to configure that parameter.


  Name of Application Group 5
  Name of MCB CBEP$$MCB5 file
  Name of SFS CBEP$$SFS5 file
  Name of Application Group 6
  Name of MCB CBEP$$MCB6 file
  Name of SFS CBEP$$SFS6 file
  Name of Application Group 7
  Name of MCB CBEP$$MCB7 file
  Name of SFS CBEP$$SFS7 file
  Name of Application Group 8
  Name of MCB CBEP$$MCB8 file
  Name of SFS CBEP$$SFS8 file
  Name of Application Group 9
  Name of MCB CBEP$$MCB9 file
  Name of SFS CBEP$$SFS9 file
```

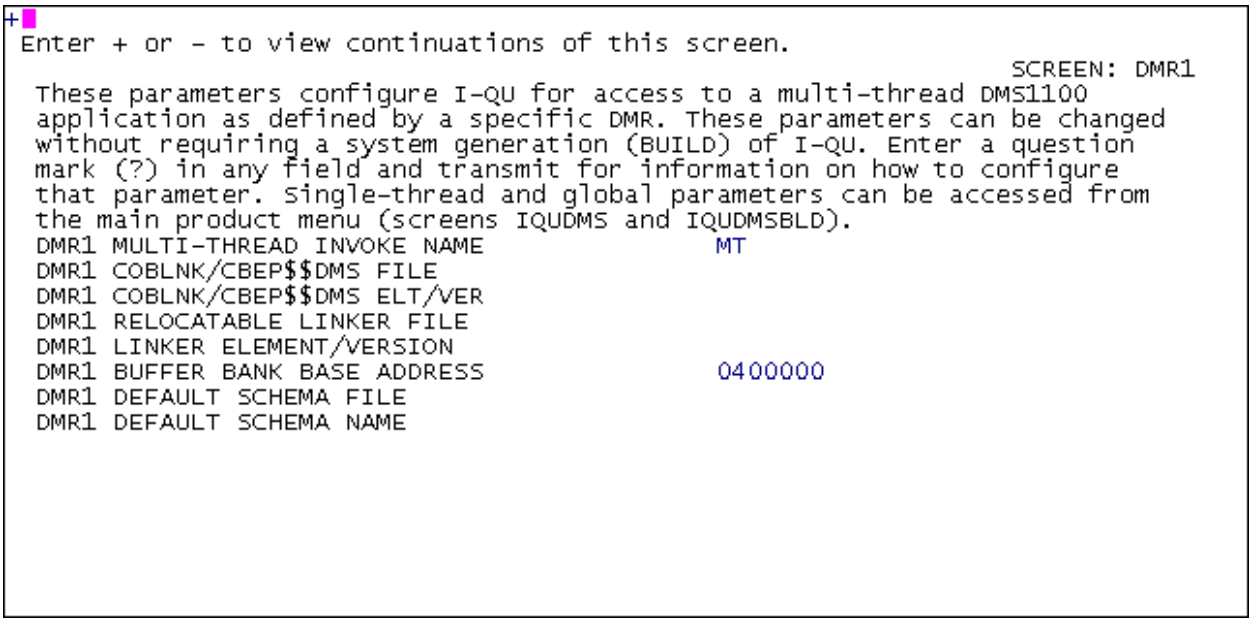
3.6.3 Global Dynamic Parameters for DMS 2200 Access

The following parameters can be changed without requiring an I-QU PLUS-1 generation or installation. Their values are used to turn ON/OFF the DMS 2200 interface access code, establish features common to all DMRs/UDS Controls configured, and configure a single-thread DMR for reorganization purposes.



3.6.4 DMR Names and Unique Information

The following parameters can be changed without requiring an I-QU PLUS-1 generation or installation. The parameters on the following screens (only two out of nine possible are shown) are utilized to identify the various DMRs/UDS Controls that can be configured for I-QU PLUS-1 access.



The first multi-thread configured (SCREEN: DMR1) will be the default DMR used if the "FOR DMR-name" is not specified on the INVOKE directive. If the first multi-thread DMR is not configured, the single-thread DMR will be the default, if configured (see Section 3.3.6, "DMS2200 Parameters for I-QU Generation"). The security feature can override the defaults.

When configuring for DMS (level 9 or higher) under UDS Control, the "BUFFER BANK BASE ADDRESS" parameter may be configured to start at "0600000".

The following screen is the continuation screen for DMR1. This screen (DMR2) and the other continuation screens (DMR3 through DMR9) allow additional DMRs to be configured. This is normally not required for DMS level 9 and higher levels if schema alias processing is used.

```
disp scr=rsa1
 Enter + or - to view continuations of this screen.
                                                                SCREEN: DMR2
  These parameters configure I-QU for access to a multi-thread DMS1100
  application as defined by a specific DMR. These parameters can be changed
  without requiring a system generation (BUILD) of I-QU. Enter a question
  mark (?) in any field and transmit for information on how to configure
  that parameter. Single-thread and global parameters can be accessed from
  the main product menu (screens IQUDMS and IQUDMSBLD).
  DMR2 MULTI-THREAD INVOKE NAME
  DMR2 COBLNK/CBEP$$DMS FILE
  DMR2 COBLNK/CBEP$$DMS ELT/VER
  DMR2 RELOCATABLE LINKER FILE
  DMR2 LINKER ELEMENT/VERSION
  DMR2 BUFFER BANK BASE ADDRESS                 400000
  DMR2 DEFAULT SCHEMA FILE
  DMR2 DEFAULT SCHEMA NAME
```

3.6.5 RSA/RDMS Application Names and Unique Information

The following parameters can be changed without requiring an I-QU PLUS-1 generation or installation. The parameters on the following screens (only two out of nine possible are shown) are utilized to identify the various RDMS application interfaces, which can be configured for I-QU PLUS-1 access.

```
+
 Enter + or - to view continuations of this screen.
                                                                SCREEN: RSA1
  These parameters define RDMS1100 related configuration information which can
  be changed without requiring a system generation (BUILD) of I-QU. Enter a
  question mark (?) in any field and transmit for information on how to
  configure that parameter.


  RDMS1 APPLICATION NAME                        UDSSRC
  RDMS1 FILENAME FOR CBEP$$RSA REL              SYS$LIB$*RSA
  RDMS1 RSA PLS STACK MAX SIZE                  3000
  RDMS1 RSA WORK AREA WORD SIZE                 4450
  RDMS1 ROLLBACK IF NO END THREAD               FALSE
  RDMS1 STEP ADV IF NO END THREAD               FALSE
```

I-QU PLUS-1 must parse the BEGIN THREAD and END THREAD commands in order to track the status of thread control for the RDMS interface. It verifies the thread-name (APPLICATION NAME) is valid as configured in I-QU PLUS-1 (this is also the basis for the security enhancement).

Up to nine RDMS applications can be configured in a single I-QU PLUS-1. The configuration screen for an RDMS application requires the filename containing the CBEP$$RSA element, choices for ROLLBACK and STEP handling and the stack and workspace sizes for that RDMS level. The RDMS-ACOBDAT interface module (ACOB interface to RSA) is NOT used.

```
process
 Enter + or - to view continuations of this screen.
                                                                SCREEN: RSA2
  These parameters define RDMS1100 related configuration information which can
  be changed without requiring a system generation (BUILD) of I-QU. Enter a
  question mark (?) in any field and transmit for information on how to
  configure that parameter.


  RDMS2 APPLICATION NAME
  RDMS2 FILENAME FOR CBEP$$RSA REL
  RDMS2 RSA PLS STACK MAX SIZE                  3000
  RDMS2 RSA WORK AREA WORD SIZE                 4450
  RDMS2 ROLLBACK IF NO END THREAD               FALSE
  RDMS2 STEP ADV IF NO END THREAD               FALSE
```

The data space for the RDMS interface (stack, workspace and parameter storage) is dynamically allocated at runtime when a BEGIN THREAD is issued. This data is allocated in a special D-bank, and hence, it does not affect the size or addressing of the main D-bank for I-QU PLUS-1. This D-bank is allocated beyond the end of the I-QU PLUS-1 process I-banks and before the start of the main D-bank, overlaying the address space of the utility I-bank. Thus, lowering the start address of the I-QU PLUS-1 D-bank could restrict the size of the stack and workspace areas for RDMS. If space becomes a problem, additional space can be obtained by not using the C$DML common bank. Not using the C$DML common bank will add 022000 (or 037000) to the available area for the RDMS interface to acquire. In addition, it will reduce the size of the main D-bank by about 05400 words that may allow the start address of that bank to be increased, and thus, provide more room for the RDMS interface to acquire. The space dynamically acquired for the RDMS interface to use is released when the INIT command is performed.

3.7 STEP-6: Registering IQU$DTM

KMSYS Worldwide also provides a BIS run called IQU$DTM which is required if the BIS DTM interface is to be used in I-QU PLUS-1 programs. The BIS DTM interface can be configured by setting the "DTM INTERFACE" parameter on the BASIC screen (see Section 3.6.1, "Basic I-QU PLUS-1 Dynamic Configuration Parameters"). The IQU$DTM run is in file SYS$LIB$*IQU. The IQU$DTM run should be placed in a form type generated with 132-character lines and the full character set. The BIS format option must not be used when retrieving the IQU$DTM run. When the IQU$DTM run is registered as a BIS run, it should be allowed access to all modes that may be used for I-QU PLUS-1 applications development.

Chapter 4: Installation Verification

The Installation Verification Procedure is provided to ensure that all components of I-QU PLUS-1 have been correctly installed by exercising all interfaces to supporting software.

An I-QU PLUS-1 Program, named REC-COUNT, has been included as a symbolic element in the second product file (SYSLIB*IQU-1 is the default file name for the default mode install) created by the installation. REC-COUNT is a generalized procedure that may be used to count all records within a DMS 2200 database area by record type. The totals will be sorted by record name and listed.

Call the I-QU PLUS-1 Processor using conversational mode (C-option) as follows:

@*IQU-processor-name*,C<XMIT>

At the command prompt (▶Command: ▶) enter the following:

INVOKE *subschema-name* IN *schema-name* ;<XMIT>

FILE *qualifier***schema-file-name* ;<XMIT>

[FOR *DMR-INVOKE-name*]<XMIT>

ADD REC-COUNT FROM SYSLIB*IQU-1<XMIT>

Once the REC-COUNT program begins executing, REC-COUNT will prompt you for output destination ("T" for terminal or "P" for printer) and the name of the area to be counted.

The *subschema-name*, *schema-name*, *schema-file-name*, *qualifier* and area name must be supplied by the local site.

The clause "TIP *TIP-file-number*" may be used instead of the "FILE *qualifier***schema-file-name*" clause if a TIP schema file is normally used at your site.

The optional "FOR *DMR-INVOKE-name*" clause may be used to verify any DMR configured. If the clause is omitted, the default DMR, if configured, will be used (see Section 3.6.4, "DMR Names and Unique Information").

Notice that semicolons (;) are used to continue the INVOKE directive across multiple lines.

> For installation verification, the area to be used should be relatively small, but should include at least three record types to exercise the SORT interface. Refer to the I-QU PLUS-1 Programmer Reference for complete descriptions and syntax requirements of the INVOKE, ADD, COMPILE and RUN directives.

The time required to complete this process will vary depending upon the size of the area used. An area of 10 pages will be processed in a matter of seconds, while an area of 10,000 pages may take several minutes.

Upon completion of the REC-COUNT program, a sorted list of the names of all record types in the named area and totals for each will be displayed on your terminal screen or print file

depending on the selection you made when REC-COUNT started. If this does not occur, check the I-QU PLUS-1 installation.

If the INVOKE is to a single-thread DMR, the area must be assigned prior to issuing the I-QU PLUS-1 Processor call.

Chapter 5: Security

SGSs are provided to control security at your site in a variety of ways. Access can be ALLOWED or DENIED to specific users or by designated user groups. The following sections describe security controls available when using I-QU PLUS-1 utility programs; invoking DMS 2200 schemas, subschemas, and DMRs; accessing PCIOS/SFS files; performing direct I/O; manipulating DMS or RDMS data; and transfering BIS data.

5.1 Impact on Execution

Changes made to the security SGSs do not require an I-QU PLUS-1 generation or installation (COMUS BUILD/INSTALL). Once changes have been made to the element containing the security SGSs, the COMUS CONFIGURE PROCESS must be used for the changes to take effect.

5.2 Pre-scanning Security SGSs

For sites wishing to pre-scan their I-QU PLUS-1 Security SGSs for proper syntax prior to doing a COMUS CONFIGURE PROCESS, the following SSG runstream may be used:

```
@SSG,A SYS$LIB$*IQUn.SECSKEL,q*f.yoursecurity/SSGs
@EOF
```

Where "IQU*n*" is the I-QU PLUS-1 Installation File as configured in COMUS.

This procedure will make it possible to verify the SGSs without having to take I-QU PLUS-1 out of the production environment. It can also result in a substantial savings of time, as the COMUS CONFIGURE PROCESS must reprocess a number of elements in addition to the one for security.

5.3 General Notes on Security Groups

All of the group names below must be 1 to 12 characters in length. Valid names may be comprised of uppercase letters ("A" through "Z"), lowercase letters ("a" through "z"), the underscore character ("_") and the dollar sign ("$"). In addition, names may not begin with a dollar sign or underscore.

The names used in describing the member(s) of a group can be either the actual name of the object (i.e., a schema name) or can be truncated with a trailing "!" character. If the name is truncated in this manner, it will match any candidate name beginning with the same substring before the "!". In other words, MIS! would match MIS-SCHEMA1, or MIS-SCHEMA2, or MIS.

Wherever a group name is required on a security image, the pseudonym, $ALL, may be used to indicate that any group is allowed or denied access. For example, let us assume that only one user group ("DMSMAINT") is to be allowed access to the single-thread DMR ("STDMR") configured with I-QU PLUS-1. However, all users can have access to any multi-thread DMR configured. The security SGSs might appear as follows:

```
USER GROUP DMSMAINT HAS DAVID JEAN
...
ACCESS TO DMR STDMR ALLOWED FOR DMSMAINT ;
    FOR LOAD
ACCESS TO DMR STDMR DENIED FOR $ALL
ACCESS TO DMR $ALL ALLOWED FOR $ALL ;
    FOR UPDATE
```

In the example, users JEAN or DAVID would be allowed access to STDMR and could perform retrieval, update and load functions since the "FOR LOAD" clause was specified. Another user whose user-id is THOMAS (not shown) would be DENIED access to STDMR since THOMAS falls into the global user group $ALL and is not a member of user group DMSMAINT. However, THOMAS would be ALLOWED access to all other DMRs since they fall into the global DMR name $ALL. Notice that any user accessing a DMR other than STDMR could only perform retrieval and update functions ("FOR UPDATE"), not load.

$ALL may be used in clauses other than group names where shown in the syntax.

IF security is enabled for any particular facility (e.g., access to a DMR), there must be an ACCESS ALLOWED SGS for all other facilities required (e.g., utilities such as QINDEX or file interfaces such as PCIOS).

5.3.1 USER GROUP

This security image defines groups of users who can be allowed or denied access to a given facility by I-QU PLUS-1.

Format:

USER GROUP *user-group* HAS || *user-id-1* | *user-id-2* | … *user-id-n* ||

If the security feature was configured for "ACCOUNT" (vs. "USERID"), interpret all references to user-ids as references to account number.

5.4 Security on I-QU PLUS-1 Utilities

The following SGSs control access to the I-QU PLUS-1 utilities by user groups.

5.4.1 UTILITY TYPE

This security image defines groups of I-QU PLUS-1 utility programs which will be named later on the ACCESS TO UTILITY SGS.

Format:

```
UTILITY TYPE utility-group HAS { || IQU | ;
                                   QINDEX | ;
                                   PBLD | ;
                                   PFIX | ;
                                   SCHUTL | ;
                                   QRYSCH|| ;
                                | $ALL}
```

5.4.2 ACCESS TO UTILITY: ALLOWED

The ACCESS TO UTILITY SGSs allow control of which users can use any or all of the utility programs that comprise the I-QU PLUS-1 product. This SGS is useful in order to ensure control of who might execute a sensitive program such as PFIX.

Format:

```
ACCESS TO UTILITY utility-group ALLOWED FOR user-group
```

5.4.3 ACCESS TO UTILITY: DENIED

This SGS is the inverse of the ALLOWED SGS and is useful if your configuration has fewer denied combinations than allowed combinations. Since the DENIED image always causes the access check to fail, there is no need to specify the allowed usage modes here.

Format:

```
ACCESS TO UTILITY utility-group DENIED FOR user-group
```

5.5 I-QU PLUS-1 Security for DMS 2200 Access

The following SGSs control access to the DMS 2200 facility by schemas, subschemas, schema files and DMRs. The interpretation of these images is fully explained in 5.5.7, "Search Algorithm for Security (DMS)," below.

5.5.1 SCHEMA GROUP

This security image defines groups of schema names, which are named subsequently on the ACCESS security images. A group can have as many members (schema names) as desired. A trivial group consists of only one schema name. There can be as many or as few groups as are useful to your security requirements.

Format:

```
SCHEMA GROUP schema-group HAS || schema-name-1 | ;
                                 schema-name-2 | ;
                               … schema-name-n ||
```

5.5.2 SUBSCHEMA GROUP

This security image defines groups of subschemas, which are named subsequently on the ACCESS security images. A group can have as many members as desired. A trivial group consists of only one subschema name. There can be as many or as few groups as are useful to your security requirements.

Format:

```
SUBSCHEMA GROUP subschema-group HAS || subschema-name-1 | ;
                                      subschema-name-2 | ;
                                    … subschema-name-n ||
```

5.5.3 SCHEMAFILE GROUP

This security image defines groups of schema files that can be associated with a given DMR. You may need multiple groups for a given DMR if only some users are to be allowed impart access to a given schema file.

Format:

```
SCHEMAFILE GROUP schemafile-group ;
   HAS || {FILE,qual*filename-1 | TIP,file-code-1} | ;
          {FILE,qual*filename-2 | TIP,file-code-2} | ;
        … {FILE,qual*filename-n | TIP,file-code-n} ||
```

5.5.4 ACCESS TO DMR … ALLOWED

This security image controls access to the DMS 2200 facility within I-QU PLUS-1. The optional INVOKING fields allow control of what subschemas a user can access at IMPART time. The default schema and subschema for a given DMR is set as part of the configuration of that DMR.

Format:

```
ACCESS TO DMR {DMR-name | $ALL} ALLOWED FOR user-group ;
   FOR {RETRIEVAL | UPDATE | PW_UPDATE | LOAD} ;
   [INVOKING subschema-group OF schema-group FILE schemafile-group]
```

The access types (RETRIEVAL, UPDATE, PW_UPDATE and LOAD) are listed in the order of privilege; i.e., UPDATE is higher than RETRIEVAL, PW_UPDATE is higher than RETRIEVAL or UPDATE, and LOAD is higher than the other three. For example, if you have UPDATE

privileges, you can open an area for RETRIEVAL and do not need to specify an SGS allowing RETRIEVAL privileges.

5.5.5 ACCESS TO DMR … DENIED

This SGS is the inverse of the ALLOWED SGS and is useful if your configuration has fewer denied combinations than allowed combinations. Since the DENIED image always causes the access check to fail, there is no need to specify the allowed usage modes here.

Format:

ACCESS TO DMR {*DMR-name* | $ALL} DENIED FOR *user-group*

5.5.6 DEFAULT DMR

This image sets the default DMR for the INVOKE directive when multiple DMRs are configured in a single I-QU PLUS-1. This procedure is useful when merging groups of users into a single I-QU PLUS-1. The default DMR provides source level compatibility for users' INVOKE statements to select the same DMR they would have accessed under separate I-QU PLUS-1 configurations.

Format:

DEFAULT DMR IS *DMR-name* For { || *user-group-1* | ;
user-group-2 | ;
… *user-group-n* || ;
| $ALL}

I-QU PLUS-1 normally selects the first multi-thread as the default DMR, unless there is none, in which case the single-thread is the default DMR, if configured. This image will override that default for any users named in the user group list. The pseudo-name $ALL can be used to set a global default DMR. These images are searched serially with the first match condition being used. Therefore, selected user groups can be assigned to selected DMRs and then a global $ALL used to assign all others to a specific DMR (see "Search Algorithm for Security (DMS)", below). Unlike the security images, a no-find condition does not cause rejection of the request, only a reversion to I-QU PLUS-1's normal default DMR selection.

5.5.7 Search Algorithm for Security (DMS)

The security information is searched sequentially looking for an indication of access being allowed to a facility. If no explicit access is allowed, then access will not be permitted by I-QU PLUS-1. Two basic strategies can be used in building the security tables:

1. You could list all the ALLOWED combinations and then permit the undeclared to fail the search, and be rejected.
2. Alternately, you could list the DENIED combinations and then terminate the list with:

   ```
   ACCESS TO DMR $ALL ALLOWED FOR $ALL
   ```

   This image would allow the user to INVOKE/IMPART to anything for anything if they were not specifically denied access previously. Many other variations are possible depending on your site's DMR configurations and security requirements.

There are two points at which DMS security information is checked. The security tables are searched at IMPART time. The ACCESS image that allowed the user to IMPART is saved and the access modes from that image are checked whenever the user wishes to OPEN an area.

The security tables are searched only on a feature (e.g., DMS) and object (e.g., user, DMR name, schema file, schema and subschema) relationship. The access type is NOT a search criteria, it is the result returned if the table search indicates that some access is allowed. In other words, if a find occurs indicating that only retrieval type access is allowed, it does not

matter that a later ACCESS image would allow this object combination to update, an OPEN FOR UPDATE would be rejected.

Note that there is no security enforcement of what a user can compile. He can INVOKE, DEFINE F, or compile any syntactically correct image (subject to EXEC access control on the named schema file). Security enforcement is performed only at run time, and only if the command is executed. A program could contain legal and illegal commands for a given user and if the flow of control never encountered an illegal command, the program could execute normally.

5.6 I-QU PLUS-1 Security for PCIOS Access

These SGS cards control access modes for PCIOS files by file type. The interpretation of these images is similar to that of the DMR facility.

5.6.1 PCIOS TYPE

This SGS controls the type of PCIOS file to be accessed by a PCIOS group.

Format:

PCIOS TYPE *PCIOS-group* HAS { || CATALOGED | TEMPORARY || | $ALL}

Both CATALOGED and TEMPORARY can be specified for the same PCIOS group.

5.6.2 ACCESS TO PCIOS … ALLOWED

This security image controls access to the PCIOS facility within I-QU PLUS-1.

Format:

ACCESS TO PCIOS *PCIO-group* ALLOWED FOR *user-group* ;
FOR {READ | READ_WRITE | $ALL}

5.6.3 ACCESS TO PCIOS … DENIED

This SGS is the inverse of the ALLOWED SGS and is useful if your configuration has fewer denied combinations than allowed combinations. Since the DENIED image always causes the access check to fail, there is no need to specify the allowed usage modes here.

Format:

ACCESS TO PCIOS *PCIOS-group* DENIED FOR *user-group*

5.6.4 Search Algorithm for Security (PCIOS)

The search of the security records will be performed at file OPEN time. The file's OPEN request (INPUT, OUTPUT, UPDATE, etc.) will be compared to the permissions granted to that user. If it is valid, no further checks will be performed. A problem could exist if the user changes the file name association via CSF$ @USE after the OPEN (not logical, but someone could do it).

5.7 I-QU PLUS-1 Security for DIO Access

These SGS cards control access modes for DIO files by file type. The interpretation of these images is similar to that of the DMR facility.

5.7.1 DIO TYPE

This SGS controls the type of DIO file to be accessed by a DIO group.

Format:

```
DIO TYPE DIO-group HAS { || FCSS | ;
                          TIPDMS | ;
                          CATALOGED | ;
                          TEMPORARY || ;
                       | $ALL}
```

A combination of FCSS, TIPDMS, CATALOGED, and TEMPORARY can be specified for a DIO group.

5.7.2 ACCESS FOR DIO ... ALLOWED

This security image controls access to the DIO facility within I-QU PLUS-1.

Format:

```
ACCESS TO DIO DIO-group ALLOWED FOR user-group ;
   FOR {READ | READ_WRITE | $ALL}
```

5.7.3 ACCESS TO DIO ... DENIED

This SGS is the inverse of the ALLOWED SGS and is useful if your configuration has fewer denied combinations than allowed combinations. Since the DENIED image always causes the access check to fail, there is no need to specify the allowed usage modes here.

Format:

```
ACCESS TO DIO DIO-group DENIED FOR user-group
```

5.7.4 Search Algorithm for Security (DIO)

The search of the security records will be performed on the first I/O via the specified file control table (FCT). The program can (and frequently will) change the file association via @USE and we cannot economically detect this change. This problem only exists if you allow direct I/O to temporary or cataloged files but not to both, for a given user. Otherwise, the system is solid. Realistically, there is not much security if you split the enforcement of temporary and cataloged files other than that provided by the EXEC and with site programming standards.

5.8 I-QU PLUS-1 Security for RDMS Access

Since UDS provides most security controls required for RDMS, I-QU PLUS-1 does not duplicate that effort. The only security configurable in I-QU PLUS-1 is a simple check as to whether a user is allowed to access a given RDMS application. Detail control of access and update privileges is left to UDS. The only security provided for RDMS 2200 access is whether a user can access RDMS. Any additional security desired should be configured through the data dictionary interface for UDS.

5.8.1 ACCESS TO RDMS ... ALLOWED

This security image controls access to the RDMS 2200 facility within I-QU PLUS-1.

Format:

ACCESS TO RDMR {*application*-name | $ALL} ALLOWED FOR *user-group*

5.8.2 ACCESS TO RDMS ... DENIED

This SGS is the inverse of the ALLOWED SGS and is useful if your configuration has fewer denied combinations than allowed combinations.

Format:

ACCESS TO RDMR {*application*-name | $ALL} DENIED FOR *user-group*

5.9 I-QU PLUS-1 Security for DTM Access

Since BIS provides most security for DTM access, I-QU PLUS-1 does not duplicate that effort. The I-QU PLUS-1 security feature can be configured to control which users are allowed to access which BIS queue names and whether they can read and write, or just read reports. Note that the user must still supply a valid BIS signon in the parameter block and that the signon must be validated for access to the run specified in the parameter block and that run must be allowed access to the requested report.

The ACCESS TO DTM SGSs allow control of which users can access a particular BIS DTM SCHDLR queue name and whether it may be opened for INPUT or OUTPUT (the only currently supported access modes). This security is in addition to the security imposed on the DTM interface by BIS in requiring a valid userid/department/password combination along with the run registration security of what reports can be accessed.

5.9.1 ACCESS TO DTM ... ALLOWED

This security image controls access to the DTM facility within I-QU PLUS-1.

Format:

ACCESS TO DTM {*queue-name* | $ALL} ALLOWED FOR *user-group* ;
FOR {READ | READ_WRITE | #ALL}

5.9.2 ACCESS TO DTM ... DENIED

This SGS is the inverse of the ALLOWED SGS and is useful if your configuration has fewer denied combinations than allowed combinations. Since the DENIED image always causes the access check to fail, there is no need to specify the allowed usage modes here.

Format:

ACCESS TO DTM {*queue-name* | $ALL} DENIED FOR *user-group*

5.10 Security Examples

The following example illustrates a security configuration for DMS, PCIOS and DIO access. If no security SGSs were supplied, then there is no security. If security is desired for one file structure, then security SGSs must be supplied for all file structures (see the PCIOS SGSs in the example below).

The DMS security SGSs are for a system with two DMRs; APPL1 is the production DMR, APPL2 is the test DMR and STHRED is the single-thread DMR used for reorganization purposes only. There are two production schemas running under APPL1: HRDB and MFGFINDB. A test version of these schemas runs under APPL2. There are two subschema groups that are allowed to access the HRDB schema only: PAYROLL and PLANNING. The ACCTG and ORDENTRY subschema groups are allowed only to access the MFGFINDB schema.

All production schemas and subschemas reside in TIP file 107, while the test versions are in EXEC file DMS2*SCHFILE.

The user groups DBSTAFF and SECURITY will INVOKE against the APPL2 DMR if they do not specify the DMR on the INVOKE directive. However, they are not restricted only to using the APPL2 DMR.

Notice that no user can access either DMR for LOAD. Opening areas for INITIAL LOAD from I-QU PLUS-1 is not recommended.

As described earlier, the ACCESS SGS can be used to restrict access. One example of restricting access is the ACCESS SGS for the HRQUERY user group shown below. The user group is restricted to accessing only the PAYROLL subschema group, which has two subschemas grouped together: PAYSUB and PERSUB. Furthermore, the group can only use the HRDB schema in TIP file 107.

The user group DBSTAFF is the only user group that is allowed access to the I-QU PLUS-1 utilities PBLD, PFIX and SCHUTL.

All users have PCIOS access. However, no users have RDMS 2200 or DTM access since no security SGSs were included for those interfaces.

The security shown below for DIO is an example of how to restrict access utilizing one of the "ACCESS...DENIED" SGSs. Only the users in the SECURITY users group can use DIO commands on all file types. Any other user can use DIO commands on CATALOGED and TEMPORARY files only.

Example:

```
USER GROUP HRENTRY HAS CLAUSE ROBERT LINDA
USER GROUP HRQUERY HAS DAVID GEOFF
USER GROUP RESMGT HAS JEAN GEOFF2
USER GROUP ACCTUSERS HAS ANDIE CARLOS JANE
USER GROUP OEUSERS HAS ANDY LARRY
USER GROUP DBSTAFF HAS RENEE HANS
USER GROUP SECURITY HAS SECURI DBA
DEFAULT DMR IS APPL2 FOR DBSTAFF SECURITY
SCHEMA GROUP PRODUCTION HAS HRDB MFGFINDB
SCHEMA GROUP TEST HAS HRDB MFGFINDB NEWDB
SUBSCHEMA GROUP PAYROLL HAS PAYSUB PERSUB
SUBSCHEMA GROUP PLANNING HAS PERSUB PROJSUB
SUBSCHEMA GROUP ACCTG HAS APSUB ARSUB
SUBSCHEMA GROUP ORDENTRY HAS INVSUB ARSUB
SCHEMAFILE GROUP ONLINE HAS TIP,107
SCHEMAFILE GROUP OFFLINE HAS FILE,DMS2*SCHFILE
.
```

```
ACCESS TO DMR APPL1 ALLOWED FOR HRENTRY ;
    FOR UPDATE ;
    INVOKING PAYROLL OF PRODUCTION FILE ONLINE
ACCESS TO DMR APPL1 ALLOWED FOR HRQUERY ;
    FOR RETRIEVAL ;
    INVOKING PAYROLL OF PRODUCTION FILE ONLINE
ACCESS TO DMR APPL1 ALLOWED FOR RESMGT ;
    FOR UPDATE ;
    INVOKING PLANNING OF PRODUCTION FILE ONLINE
ACCESS TO DMR APPL1 ALLOWED FOR ACCTUSERS ;
    FOR UPDATE ;
    INVOKING ACCTG OF PRODUCTION FILE ONLINE
ACCESS TO DMR APPL1 ALLOWED FOR OEUSERS ;
    FOR UPDATE ;
    INVOKING ORDENTRY OF PRODUCTION FILE ONLINE
ACCESS TO DMR APPL1 ALLOWED FOR DBSTAFF ;
    FOR UPDATE
ACCESS TO DMR APPL2 ALLOWED FOR DBSTAFF ;
    FOR UPDATE
ACCESS TO DMR $ALL ALLOWED FOR SECURITY ;
    FOR LOAD
.
UTILITY TYPE REORG HAS PBLD PFIX SCHUTL
ACCESS TO UTILITY REORG ALLOWED FOR DBSTAFF
ACCESS TO UTILITY REORG DENIED FOR $ALL
ACCESS TO UTILITY $ALL ALLOWED FOR $ALL
.
ACCESS TO PCIOS $ALL ;
    ALLOWED FOR $ALL FOR $ALL
.
DIO TYPE SECURE HAS FCSS TIPDMS
ACCESS TO DIO $ALL ALLOWED FOR SECURITY ;
    FOR READ_WRITE
ACCESS TO DIO SECURE DENIED FOR $ALL
ACCESS TO DIO $ALL ALLOWED FOR $ALL FOR $ALL
```

Chapter 6: Single-thread DMR Generation

6.1 Single-thread DMR Provided

Three single-thread DMRs, generated at KMSYS Worldwide, are provided on the I-QU PLUS-1 release tape (see Chapter 10, "DMS USERSGSs for Single-thread DMR"). These DMRs are fully functional, and one should meet the database reorganization requirements of any site; however, if you choose to generate your own single-thread DMR to be collected with I-QU PLUS-1, the following guidelines must be followed.

6.2 Multi-Banked DMR

The I-QU PLUS-1 generation process is designed to utilize a multi-banked single-thread DMR. The following configuration parameter must be used in the DMR generation.

```
CONFIGURE DMR FOR MULTIBANKING USING BDL,INITIAL
```

This parameter will cause the element MBMAP to be generated in file 4 of the DMR gen. MBMAP is used to include the single-thread DMR in the I-QU collection.

6.3 DMR Buffer Start Address

The DMR buffer address should be set to 0400000 or higher using the following DMR generations SGS:

```
START ADDRESS OF THE MULTIBANKED DMR BUFFER IS 0400000
```

This start address will ensure that adequate address space is available for I-QU to expand its DBANK for opening files, etc.

6.4 DMR Buffer Sizing

Since only one run-unit and one schema can be used within the single-thread DMR at any time, you should size the DMR buffer accordingly. The DMR reference tables, description tables and page buffer can be made much smaller than the sizes used for the multi-thread DMR.

6.5 TIP QUICK-LOOK Files

While not essential, it is a good practice to set the TIP QUICK-LOOK file codes to a set that is not being used in the multi-thread production environment (or for any other purpose). Normally the single-thread DMR will be used with NO-LOOKs; however, if quick looks are taken by mistake and the production QUICK-LOOK files are being used, database corruption

may result. EXEC QUICK-LOOK files (used only with EXEC database areas) may simply be @ASG'ed as temporary files to avoid this problem.

6.6 Unique Bank and Entry Point Names

It is recommended that the single-thread DMR be generated with different names for the DMR entry point, DMR buffer and I-Banks. While not necessary for correct program execution, assigning unique names will avoid possible confusion with names used in the multi-thread environment.

6.7 IGNORE SET Fix

In order for the IGNORE SET function of the SCHUTL utility program to work correctly in all situations, a sort fix must be applied to the DMR. This fix will not affect the DMR's operation, but simply corrects the method used to search for number set links for each set in which a record participates. This fix is only necessary in the single-thread DMR; however, it may also be applied to the multi-thread DMR.

The fix is as follows for DMS 2200 8R2 and 8R3.

```
*DH21C
-57
         L         A1,A3           .   ABS ADDR OF RECORD
         A         A1,SME005,A2    .   ADD REL POSITION OF LINKS
-60,60
-62
         L         A1,A3           .   ABS ADDR OF RECORD
         A         A1,RDT007,X3    .   ADD REL POSITION MFCW
         L         A2,X3           .   START OF RDT
         A         A2,RDT015,X3    .   START OF MANUAL SME'S
```

6.8 IMPORTANT CONSIDERATION

When setting up the single-thread DMR generation, do not attempt to generate both multi-thread and single-thread DMR at the same time. Generating both DMRs at the same time will result in a corrupt single-thread DMR. You should also generate a single-thread version of the DMU for off-line verification of your database reorganizations. Your SYSGEN SGS should look like this:

```
SYSGEN ST DMR,DMU
```

At the completion of the DMR generation, you will need to load the fourth file from the output master. This file name should be entered on the COMUS configuration screen, DMSBLD (see Section 3.3.6, "DMS2200 Parameters for I-QU Generation"), prior to @STARTing the run stream produced from the COMUS BUILD of I-QU PLUS-1. The two parameters requiring this file name are "DMS2200 CALC ROUTINE(S) FILE" and "SINGLE-THREAD DMS FILE ". You will also need the NEWDMRST file for the single-thread DMU, LINKER and COBLNK elements. The NEWDMRST filename (qualified by the PROJ-ID specified during the COMUS BUILD of DMS) should be entered on the "SINGLE-THREAD COBLNK FILE" and "SINGLE-THREAD LINKER FILE" parameters.

Chapter 7: ACOB Library Considerations

There are several possible permutations of ACOB installations, which may cause some problems when generating I-QU PLUS-1. The default generation of I-QU PLUS-1 expects the ACOB library and the CBEP$$ACOB module to be in the file SYSLIB*ACOB and the ACOB processor call to be @ACOB.

The ACOB library consists of one to three cataloged files (as installed by COMUS). The default library file is SYSLIB*ACOB. It will contain one (and only one) CBEP$$ACOB element. Depending on your choices during the ACOB installation, this element will have one of the following version names:

PART-LIB-CB	Utilized for collections not linking to the C$DML common bank but which use common banked versions of the other ACOB library routines.
FULL-LIB-CB	Utilized for collections linking to the C$DML common bank.
NO-LIB-CB	Utilized for collections not linking to ANY ACOB common bank.

Note: Refer to the "ASCII COBOL Compiler (ACOB)" section of the OS 2200 Software Products Installation Guide, 7831 0612, for a list of possible locations of the CBEP$$ACOB elements.

The other ACOB library files, which may optionally be created during the ACOB installation process, are:

SYSLIB*ACOB-DML	This file is created to hold the FULL-LIB-CB version of the CBEP$$ACOB element. It allows using the C$DML common bank even though that is not the default for your site. The ACOB documentation refers to SYSLIB*ACOB-DML as the "utility CBEP$$ACOB" file.
SYSLIB*ACOB-CB	This file is created to hold the PART-LIB-CB version of the CBEP$$ACOB element. It allows using the ACOB common banked libraries (except C$DML) even though that is not the default for your site. The ACOB documentation refers to this file as the "common bank CBEP$$ACOB" file.

Normally, you would generate I-QU PLUS-1 to use the most common banked form of the ACOB libraries available on your system. If you have the C$DML common bank available, you should set the C$DML configuration parameters for the I-QU PLUS-1 generation and ensure that the element, CBEP$$ACOB/FULL-LIB-CB, is included in the I-QU PLUS-1 collections. If the FULL-LIB-CB is not the default CBEP$$ACOB on your system, you will need to use the INCLUDE SGS discussed below.

If your system has a pre-6R1 level of ACOB installed, you must either upgrade to a more current ACOB level, or compile and collect I-QU PLUS-1 with an alternate ACOB processor and library. In this case, you MUST ensure the following:

- CBEP$$ACOB/NO-LIB-CB element is included in the I-QU PLUS-1 collections;
- Full relocatable ACOB library file is LIBed in the I-QU PLUS-1 collections;
- Non-reentrant ACOB compiler is utilized for the I-QU PLUS-1 compilations (ACOB/BANKED on the release tape but normally loaded into a sideline file as ACOB).

Thus, use of an alternate ACOB level will require the CO$ACOBPROCESSOR SGS as discussed below, and may require the INCLUDE and/or NOT SGSs.

If you are installing I-QU PLUS-1 using the C$DML common bank and your ACOB installation does not assume C$DML usage, you must explicitly include the CBEP$$ACOB/FULL-LIB-CB element. The following SGS will be correct (assuming standard library names):

```
INCLUDE SYS$LIB$*ACOB-DML,CBEP$$ACOB/FULL-LIB-CB
```

If you do not wish to use the C$DML common bank and your ACOB installation uses it by default, you must select the element, CBEP$$ACOB/PART-LIB-CB. In addition, if your ACOB library file does not contain the required relocatable versions of the ACOB library routines (one ACOB installation option is to delete those that are also contained in the installed common banks) you will have to manually load those routines from the ACOB release tape and place them in a sideline file. The following SGS will normally be correct for selecting the proper CBEP$$ACOB element. Also, see the CO$ACOBPROCESSOR SGS.

```
INCLUDE SYS$LIB$*ACOB-CB,CBEP$$ACOB/PART-LIB-CB
```

If you do not wish to use any ACOB common banked library routines, you must either include the CBEP$$ACOB/NO-LIB-CB element or prevent the inclusion of any CBEP$$ACOB element. Excluding ACOB common banked library routines can be performed with the following SGS:

```
NOT CBEP$$ACOB
```

If you have either your ACOB library or ACOB compiler installed in a non-standard file, you must also include a CO$ACOBPROCESSOR SGS (see the COMUS User Guide for additional information). This SGS is specified as:

```
CO$ACOBPROCESSOR CALL NAME IS ''q*f.ACOB'' ;
   OPTIONS ARE ces LIBRARY FILE IS ''q*f.''
```

The call name of the compiler and the library file are entirely arbitrary and must simply match the way ACOB is loaded on your system. The compiler options must include options for listing control. Options such as "T" (reverse DISPLAY and DISPLAY-1 usage defaults) will prevent proper operation of I-QU PLUS-1. If you need to specify ACOB "extra-options," you may supply them as an optional second subfield following the primary options. You may use the literal string, "NONE", for the options if you do not wish to specify any options.

Note: If you are unsure how your ACOB library is installed (i.e., what libraries, if any, are usable from common banks), you should look at the version names of the CBEP$$ACOB elements in the three library files mentioned in the above discussion. If you find a particular version and INCLUDE it, you will be using that form of the libraries. This procedure may be complicated by the fact that for compatibility with pre-COMUS ACOB installation procedures, many sites may not use the default ACOB library file names (these can be changed by using the INSFILEn parameter on the COMUS INSTALL ACOB command). You can determine which library files were registered as part of the ACOB installation by using any text editor to view the element:

```
SYS$*DATA$.CO$INSTALL$/COMUS$
```

If your site has installed ACOB in a nonstandard fashion or is running non-supported levels of software, you will have to determine the required library names, etc., manually.

Chapter 8: MCB Considerations

Since the TIP primitives that are used by I-QU PLUS-1 have been replaced by KMSYS Worldwide code that can access COMPOOL or any configured MCB, there is no longer any default TIP library file. The KMSYS Worldwide replacement primitives maintain the Unisys name and calling conventions so that a site can replace them with their own customized versions, should it be necessary. The replacement would be done as in the past by supplying a CO$TIPPROCESSOR card with a library name. No CO$TIPPROCESSOR SGS or one without a library clause will default to the KMSYS Worldwide primitives.

If you desire to use the new capability to access COMPOOL and MCB from one absolute, make sure that you do not have a library field on any CO$TIPPROCESSOR permanent SGS. This permanent SGS may have been entered when the I-QU PLUS-1 products defaults were defined during a previous COMUS BUILD session. You may view and/or reenter any permanent SGSs entered in this manner by using the "Q" option on the COMUS BUILD. Another place that permanent SGSs may reside is in the "MISC PARAMETERS" element which may have been named on the ENVIRON screen during the COMUS CONFIGURE session.

Even though one I-QU PLUS-1 absolute can access any application group, users must be careful not to attempt to access more than one application group per I-QU PLUS-1 execution. The most likely incident is when an I-QU PLUS-1 execution INVOKEs a TIP schema file through an MCB in one application group and a subsequent IMPART is done to a schema that requires a different application group. In this case UDS/DMS will return an error which implies that the specified schema cannot be found (DMS ERROR-NUM=0166). This error is returned because UDS DMS will only look for schemas that belong to the application group with which the request is currently associated.

An INVOKE or explicit CONNECT will maintain any previous application group association that may have been present. If there is currently no application group association, the connection will be made through COMPOOL, without an application group, unless it is a user-explicit CONNECT with an application group specified.

To generate I-QU PLUS-1 without requiring any TIP library, use the following SGS in the generation:

```
CO$TIPPROCESSOR CALL NAME IS NOT
```

An I-QU PLUS-1 generated in this manner cannot invoke TIP schemas or process TIP or TIPDMS DIO files, but is a fully functional I-QU PLUS-1 in all other respects.

Chapter 9: Pre-GENed I-QU PLUS-1 Parameters

The following configuration screens show the default generation parameters. These were the parameters used to BUILD/INSTALL the I-QU PLUS-1 contained on the product release tape. They are not the defaults used when generating I-QU PLUS-1 at your site. In addition, the parameters shown on these screens should be examined carefully and changed where necessary, prior to installing the default generation as outlined in the Quick Installation Procedure in Chapter 1.

The following screen is the first screen for Selection 2 from the main menu. The parameter values shown were used to generate I-QU PLUS-1 absolutes on the release tape.

```
Enter + or - to view continuations of this screen.
                                                          SCREEN: ENVIRON
 These parameters define information which can only be changed by an I-QU
 system generation. Enter a question mark (?) in any field and transmit for
 information on how to configure that parameter. Other generation parameters
 can be viewed with selections #3 and #4 from the main menu (use the BACK
 command). Other related parameters will be found on page two of this screen
 sequence.
 FILENAME OF MISC PARAMETERS ELT              IQU*MAINT
 ELEMENT NAME OF MISC PARAMETERS              EXGENSGS
 OBJECT COMPUTER TYPE                         THIS SYSTEM
 USE COMMON BANKED SORT LIBRARY               FALSE
 ACOB LIBRARY CBEP$$ACOB FILE                 THIS SYSTEM
 ACOB C$DML BANK TYPE                         THIS SYSTEM
 ACOB C$DML BANK SIZE                         THIS SYSTEM
 QWIZZ PRODUCT FILE                           SYS$LIB$*QWIZZ
 INSTALL NAME FOR I-QU PROGRAM
 INSTALL NAME FOR QINDEX PROG
 INSTALL NAME FOR PFIX PROG
 INSTALL NAME FOR PBLD PROG
 INSTALL NAME FOR SCHUTL PROG
 INSTALL NAME FOR QRYSCH PROG
```

The following screen is the second screen for Selection 2 from the main menu. It can be reached by typing a plus sign (+) in the home position on the previous screen and transmitting. The parameter settings on this screen are required to INSTALL I-QU PLUS-1. If you are using the Quick Installation Procedure outlined in Chapter 1, make sure the bank names and BDIs are set to "NONE" in your COMUS configuration set prior to @STARTing the runstream produced by the COMUS INSTALL.

```
Enter + or - to view continuations of this screen.
                                                              SCREEN: ENVIR2
 These parameters define information which can only be changed by an I-QU
 system generation. Enter a question mark (?) in any field and transmit for
 information on how to configure that parameter. Other generation parameters
 can be viewed with selections #3 and #4 from the main menu (use the BACK
 command). Other related parameters will be found on page one of this screen
 sequence.
 I-QU EXECUTION COMMON IBANK NAME              NONE
 I-QU EXECUTION COMMON IBANK BDI               NONE
 I-QU EDITING COMMON IBANK NAME                NONE
 I-QU EDITING COMMON IBANK BDI                 NONE
 I-QU DMS I/F COMMON BANK NAME                 NONE
 I-QU DMS I/F COMMON BANK BDI                  NONE
 I-QU FEATURE COMMON BANK NAME                 NONE
 I-QU FEATURE COMMON BANK BDI                  NONE

 DTM PROC FILE                                 MAPTEST*HLDMAP
 DTM SCHDLR INTERFACE BDI                      0403133
 I-QU DBANK START ADDRESS                      0154000
 DB4 PRODUCT LIBRARY FILE                      NONE
```

The following screen is Selection 3 from the main menu. The parameter values shown were used to generate I-QU PLUS-1 absolutes on the release tape.

```
                                                              SCREEN: BUILD
 These parameters define information which can only be changed by an I-QU
 system generation. Enter a question mark (?) in any field and transmit for
 information on how to configure that parameter. DMS1100 related parameters
 can be viewed with selection #2 from the main menu (use the BACK command).


 MAX VARIABLE NAMES                            400
 DATA STORAGE AREA (DOUBLE WORDS)              800
 PROGRAM STORAGE SIZE (COMMANDS)               1400
 MAXIMUM LABELS IN A PROGRAM                   400
 MAXIMUM FILES (DEF F DIRECTIVES)              10
```

The following screen is Selection 4 from the main menu. The single-thread DMR included in the default generation of I-QU PLUS-1 was generated at KMSYS Worldwide, Inc. The DMS USERSGSs used to generate this DMR can be found in Chapter 10, "DMS USERSGSs for Single-thread DMR".

```
                                                                SCREEN: DMSBLD
These parameters define information which can only be changed by an I-QU
system generation. Enter a question mark (?) in any field and transmit for
information on how to configure that parameter.


DMS1100 CALC ROUTINE(S) FILE                KMS*DMSSTLIB
DMSCALC SIMULATION                          TRUE
RANDENTIAL SIMULATION                       TRUE

GENERATE SINGLE-THREAD DMR                  TRUE
SINGLE-THREAD DMS FILE                      KMS*DMSSTLIB
SINGLE-THREAD COBLNK FILE                   KMS*DMSSTLIB
SINGLE-THREAD LINKER FILE                   KMS*DMSSTLIB
SINGLE-THREAD LINKER ELT/VERSION            LINKER
SINGLE-THREAD PROG BANK DBP(S)              FALSE
SINGLE-THREAD DBP CONFIG SOURCE
```

Chapter 10: DMS USERSGSs for Single-thread DMR

The following is an example of the DMS USERSGSs used in the generation of a single-thread DMR (level 8R3J) for use with the I-QU Processor. This is the configuration used for the single-thread DMR collected with the I-QU Processor absolute included on the product release tape. These SGSs may also be found in the single-thread DMR relocatable file (F13) on the I-QU PLUS-1 release tape (see element USERSGS/PCF). This relocatable file can be used when generating I-QU PLUS-1 at your site. The generated DMR on this file was generated to accommodate large (trivial) subschemas and to provide a large page buffer. The reference table is 40,000 words and the page buffer is 50,000 words. Two smaller DMRs are also included on the release tape (see the notes on the last page of this chapter).

```
-1,157          . REPLACE ENTIRE ELEMENT
.                 KMS SINGLE-THREAD DMR 8R3J
SYSGEN     ST DMR,DMU
.
.
.             ST    MT
.             DMR   DMR   DMU   DDLSDDL   ADMLP   FDMLP   PDMLP    DRU   DDS
LIST          Y,Y,Y,N,N,N,N,N,N
.
.
. SIMPLY ERASE THE PROCESSORS YOU DO NOT WANT, THEN REPLACE 'N' BY 'LIST'
. AS REQUIRED
.
FTNBNK     LOCAL
.
MAXIMUM NUMBER OF DYNAMIC AREAS IS 60
MAXIMUM NUMBER OF RECORDS IN A SET OCCURRENCE IS 10000
MAXIMUM NUMBER OF DOWNED AREAS IS 60
MAXIMUM NUMBER OF RECORDS WITH INTERVAL CLAUSE IS 10
MAXIMUM NUMBER OF AREAS OPEN FOR INITIAL LOAD IS 10
MAXIMUM NUMBER OF CONCURRENT RUN UNITS IS 1
MAXIMUM NUMBER OF SCHEMAS IS 1
MAXIMUM NUMBER OF SUBSCHEMAS IS 1
MAXIMUM NUMBER OF RLT ENTRIES USED FOR ALTER LOCKS IS 50
INITIAL NUMBER OF BUT BUFFERS IS 40
NUMBER OF BUT ENTRIES IN EACH BUFFER IS 12
INITIAL NUMBER OF RLT ENTRIES IS 60
NUMBER OF RLT ENTRIES IN EACH OVERFLOW BUFFER IS 9
.
BUFFER SIZE FOR THE DESCRIPTION TABLES IS 8000
BUFFER SIZE FOR THE REFERENCE TABLES IS 40000 . FOR LARGE SCHEMAS
BUFFER SIZE FOR THE EXEC PAGE BUFFER IS 50000
BUFFER SIZE FOR THE TIP PAGE BUFFER IS 12000
.
```

Only DMR generation required for reorganization with I-QU PLUS-1. DMU (F14) can be used for verification.

One (1) for single-thread environment – keep at one to reduce the size of tables generated.

Large reference buffer in large subschemas such as trivial subschemas. Large page buffer for efficiency.

```
START ADDRESS OF THE USER DBANK IS 0170000
START ADDRESS OF THE MULTIBANKED DMR BUFFER IS 0450000
.
RUN-UNIT EXISTENCE TIME IS 175 SECONDS
.
RUN CARD FOR TIMER IS            @RUN,A  TIMER,0,DMS,100,1000
RUN CARD FOR CHECKPOINT IS       @RUN    CHKREQ,0,DMS,100,1000
RUN CARD FOR DMRCLEAR IS         @RUN    DMRCLR,0,DMS,100,1000
RUN CARD FOR SCHEMACLEAR IS      @RUN    SCHCLR,0,DMS,100,1000        .
8R300673
.
APPLICATION GROUP IS 7
APPLICATION NAME IS 'SGLTHD'
NAME OF THE SYSTEMS FILE IS 'DMS-SYS-FILE'
TIP-CODE OF THE SYSTEMS FILE IS 9999
.
ENTRY POINT FOR THE DMR IS 'TDMRMT$'
ENTRY POINT FOR THE MULTIBANK BUFFER IS 'TDMRMB$'
ENTRY POINT FOR THE MCB IS '0'
.
DMS UNIVERSAL QUALIFIER IS 'QKMS'
.
NUMBER OF THE TIP SEGMENT FILE IS 9998
NAME OF THE EXEC SEGMENT FILE IS 'SEGMENT-FILE'
.
PREP FACTOR FOR THE QUICK LOOK FILES IS 448 WORDS
ROLLBACK BUFFER SIZE IS 1792 WORDS
.
PAGE SIZE FOR DMU VERIFY IS 57 LINES
.
FILE NAME FOR EXEC QUICK-LOOK FILE IS 'QUICK-LOOK1' ;
     ALLOCATE FIXED SEGMENTS OF 1236 SECTORS EACH
FILE NAME FOR EXEC QUICK-LOOK FILE IS 'QUICK-LOOK2' ;
     ALLOCATE 8 FLOATING SEGMENTS OF 4944 SECTORS EACH
.
FILE NUMBER FOR TIP QUICK-LOOK FILE IS 9997 ;
     ALLOCATE FIXED SEGMENTS OF 1236 SECTORS EACH
FILE NUMBER FOR TIP QUICK-LOOK FILE IS 9996 ;
     ALLOCATE 5 FLOATING SEGMENTS OF 4944 SECTORS EACH
.
CONFIGURE LOCATION-MODES FOR DIRECT,CALC,VIA-SET,INDEX-SEQUENTIAL
CONFIGURE SET-MODES FOR PTR-ARRAY,INDEXED-PTR-ARRAY
CONFIGURE MAPPINGS FOR COBOL
CONFIGURE FEATURES FOR DBP,ACCESS-CONTROL,GENERALIZED-NAMES,;
   SARP,DARP,TIP,DESC-TABLE-CHAIN,SEARCH-DATA-PAGES,;
   QUICK-LOOKS,STATISTICS,DEFERRED-UPDATES,RANDENTIAL,;
   ENCODE-DECODE,CHECK,LAST-DATA-PAGE,CALC-OVRFLW-PLCMNT,;
   RESULT-ITEMS
CONFIGURE DEBUGGING FOR ERROR-DUMP,ERROR-SAVE
CONFIGURE COMMON-BANK FOR TIMER,AUDIT-TRAIL-TAPES
CONFIGURE MACHINE FOR 2200/60
00674
CONFIGURE AUDIT-TRAIL-TAPE FOR COMP-AFTER-LOOKS
.
00677
CONFIGURE TIMER FOR SYSTEM-FILE-ASSIGN,KEEP-IN-CORE
CONFIGURE DEADLOCK FOR UPDATES ROLLBACK
```

Unique entry point names to avoid confusion with the multi-thread environment.

Unique universal qualifier to avoid accidental dynamic file assignment with the production qualifier.

TIP file numbers large enough to avoid accidental use of production TIP files. Note: Quick-Looks are not normally used in the I-QU PLUS-1 reorganization environment.

Only EXEC page buffer will be gened when deferred updates feature is configured. Excluding TIP page buffer allowes for a larger EXEC page buffer.

Required to generate a multi-banked, single-thread DMR.

```
CONFIGURE SYSTEMS-FILE FOR EXEC
.
CONFIGURE CHANGE-FILE FOR EXEC
NUMBER OF CHANGE FILE FAT-ENTRIES IS 200
NUMBER OF CHANGE FILE INDEX-ENTRIES IS 55
NUMBER OF CHANGE FILE INDEX-PAGES IS 97
.
CODE OF THE TIP CHANGE FILE IS 9995
NAME OF THE  CHANGE FILE IS 'CHANGE-FILE'
QUALIFIER OF THE  CHANGE FILE IS 'QKMS'
PREP FACTOR FOR THE CHANGE FILE IS 112 WORDS
LIMIT FOR GLOBAL DEFERRED UPDATES IS 40
LIMIT FOR LOCAL DEFERRED UPDATES IS 35
.
. THE FOLLOWING IS THE DEFAULT BANKING SCHEME FOR A MULTIBANKED
. DMR CONFIGURATION.
. TO CONFIGURE A MULTIBANKED DMR YOU MUST INCLUDE A CONFIGURE DMR
. FOR MULTIBANKING USERSGS CARD
.
CONFIGURE DMR FOR MULTIBANKING USING BDL,INITIAL
CONTROLBANK QDMR1$,QDMR1$,RQD  IV01,IV02,IV03,IV04,IV14,;
                    TH01,TH02,TH03,TH05,TH06,TH08,TH12,TH15,;
                    DC05,;
                    DH01,DH02,DH03,DH07,DH14,DH21,DH22,DH30,;
                    DH52,DH54,DH57,DH58,DH59,;
                    CA01,CA02,CA03,CA04,;
                    IO01,IO02,IO03,IO05,;
                    RR01,;
                    GS01,GS02,GS03,GS04,GS07,GS09,GS12,;
                    GS15,GS16,GS20,GS22,;
                    UT01,UT02,UT03,UT04,MIDDMR,ENDDMR
BANK QDMR2$,QDMR2$,RQD   IV05,IV08,IV09,IV10,;
                    TC01,TC04,TC06,TC09,TC13,TC14,TC15,TC16,TC17,;
                    TH09,TH14,;
                    DH16,DH17,DH20,DH23,DH24,DH46,;
                    RR05,UT05,IV13
BANK QDMR3$,QDMR3$,RQD  DC21,DH08,DH10,DH11,DH12,DH13,;
                    DH18,DH19,;
                    DH26,DH27,DH28,DH29,DH36,DH37,;
                    DH42,DH43,DH44,DH45,DH47,;
                    DH61,;
                    GS11,GS13,GS23
BANK QDMR4$,QDMR4$,RQD  DC02,DC0301,DC0302,DC0303,DC0305,DC0306,DC07,;
                    DC08,DC11,DC12,DC14,;
                    TH04,TH17,TH20,;
                    DH05,DH09,;
                    DH25,DH34,DH35,;
                    DH38,DH39,DH40,;
                    DH53,DH56,DH60,;
                    GS06,;
                    GS17,GS21
DMRBUF QDMR5$,QDMR5$,QGD
.
. THE FOLLOWING IS A DEFAULT SEGMENTATION SCHEME FOR A SEGMENTED DMR
. CONFIGURATION. TO CONFIGURE A SEGMENTED DMR A CONFIGURE DMR FOR
. SEGMENTATION USERSGS CARD MUST BE SPECIFIED.
```

Unique bank names to avoid possible confusion with the multi-thread environment. D-option on banks and buffers allow for a smaller program when I-QU PLUS-1 is not interfacing with the single-thread DMR.

```
.
OVERLAY  1   DH12
OVERLAY  2   DH36, GS11, GS13
OVERLAY  3   TC06, TC16, TC17, DC14, RR05, UT05
OVERLAY  4   DH43,DH47                                                  .
8R300661
OVERLAY  5   DC0301, DC0302, DC0303, DC05, DH07, DH30, DH34
OVERLAY  6   DH05, DH10, DH18, DH37, DH60
OVERLAY  7   TC04, TC13
OVERLAY  8   TC01, DH16, DH17, DH20, DH24
OVERLAY  9   TC09, DH23, DH61
OVERLAY  10  TC14, TC15
OVERLAY  11  DH42, DH46
OVERLAY  12  DC02, DC11, DH09
OVERLAY  13  DC08, DC12, DH08, DH13, DH53, GS17 .
OVERLAY  14  DC21, DH11, DH44, DH45
OVERLAY  15  DC07, DH25, DH40
OVERLAY  16  DC0305, DC0306, DH19, DH35, GS23
OVERLAY  17  TH20, DH38, DH39
OVERLAY  18  DH26, DH27, DH28, DH29
OVERLAY  19  TH08, TH09, TH14
MAINSEG 0 IV00,IV01,IV02,IV03,IV04,IV05,IV08,IV09,IV10,IV13,;
          IV14,TH01,TH02,TH03,TH04,TH05,TH06,TH12,TH15,TH17,MIDDMR,;
          DH01,DH02,DH03,DH14,DH21,DH52,DH22,DH54,DH56,DH57,DH58,DH59,;
          CA01,CA02,CA03,CA04,;
          UT01,UT02,UT03,UT04,IO01,IO02,IO03,IO05,;
8R300764
          RR01,;
          GS01,GS02,GS03,GS04,GS06,GS07,GS09,GS12,GS15,GS16,GS20,;
          GS21,GS22,ENDDMR
SEG       1         2,9,11,17
SEG       2         1,3,4,10,19
SEG       3         6,7,16
SEG       4         8,5,15
SEG       5         13,18
SEG       6         12,14
```

F14 on the release tape contains a moderately sized DMR. The following two SGSs were changed for this DMR:

```
BUFFER SIZE FOR THE REFERENCE TABLES IS 30000
BUFFER SIZE FOR THE EXEC PAGE BUFFER IS 24000
```

F15 on the release tape contains a small DMR suitable for test or prototype schemas with a small number of areas/records/sets included in the subschema. The following two SGSs were changed for this DMR:

```
BUFFER SIZE FOR THE REFERENCE TABLES IS 8000 .  FOR SMALL SUBSCHEMAS
BUFFER SIZE FOR THE EXEC PAGE BUFFER IS 12000
```

Chapter 11: Installing I-QU PLUS-1 across Systems

For sites wishing to generate I-QU PLUS-1 on a OS 2200 system, and then install the generated system on another 2200, the following procedure may be used:

On the Generation System (S-1):

1. Follow the steps outlined in this I-QU PLUS-1 Installation Guide to REGISTER the I-QU PLUS-1 release tape with COMUS (REGISTER is only required one time per release level).
2. Use the COMUS CONFIGURE to enter the I-QU PLUS-1 Product License Information, for the system where the generation is to take place (S-1). If I-QU PLUS-1 is going to execute on S-1, the information on the enclosed "I-QU PLUS-1 Product License Key Information" sheet should be for S-1 and must be entered exactly as shown.

   Note: If the 2200 system where the generation is taking place (S-1) is not licensed by KMSYS Worldwide for I-QU PLUS-1 execution, you must enter the product license information as shown on the Product License Key Sheet with the exception of the following three parameters:

   - The "2200 SYSTEM TYPE" must be the system type of the S-1 system instead of the one shown on the product key sheet;
   - The "SITE ID CONFIGURED IN THE EXEC" must also be for S-1;
   - The "I-QU PLUS-1 PRODUCT VALIDATION KEY" must be set to "BUILD ONLY".
3. BUILD and INSTALL I-QU PLUS-1 as shown in the Installation Guide.

   Note: The I-QU PLUS-1 BUILD/INSTALL parameters (screens "ENVIRON", "ENVIR2", "BUILD", and "DMSBLD") should be configured for the system on which I-QU PLUS-1 will run (S-2). If I-QU PLUS-1 is going to be run on S-1 and the configuration values for the BUILD and INSTALL are not the same for both machines, a separate BUILD and INSTALL must be done for I-QU PLUS-1 execution on S-1.
4. If you do not transport your product libraries via the COMUS LIBSAVE runstream, skip to step 8 below.
5. Once the I-QU PLUS-1 installation runstream has been successfully completed, update the I-QU PLUS-1 Product License Information for S-2. You should have received an "I-QU PLUS-1 Product License Key Information" sheet for S-2. The information must be entered exactly as shown.
6. Use the COMUS CONFIGURE to PROCESS the dynamic configuration parameters for S-2 as shown in the I-QU PLUS-1 installation guide.
7. Transport product libraries via the COMUS LIBSAVE/LIBLOAD routines, and skip to step 17 below.
8. After doing a COMUS CONFIGURE, use the BOUT command to create an SDF data file containing the configuration set information from the COMUS database.

   Example:

```
CONFIGURE BOUT SET=IQU11R6 PRODUCT=IQU LEVEL=11R6 FILE=IQU*CONF-SET
```

9. Transport this file to the S-2 system by whatever means you have available (DDP, tape, etc.).

On the Execution System (S-2):

10. Use the COMUS REGISTER to register the output tape from the I-QU PLUS-1 gen on S-1 (REGISTER only required one time per release level).
11. Use the COMUS CONFIGURE command and enter "\NOSCR" (no screen mode).
12. @ADD the SDF data file transported from S-1.
13. Enter "\SCR" to return to full screen mode.
14. Update the I-QU PLUS-1 Product License Information for S-2. You should have received an "I-QU PLUS-1 Product License Key Information" sheet for S-2. The information must be entered exactly as shown.
15. Do a COMUS INSTALL using the output from the I-QU PLUS-1 gen on S-1. Follow the steps for I-QU PLUS-1 installation as shown in the installation guide.
16. Once the I-QU PLUS-1 installation runstream has been successfully completed, use the COMUS CONFIGURE to PROCESS the dynamic configuration parameters for S-2 as shown in the I-QU PLUS-1 installation guide.
17. If the BIS DTM interface is desired on S-2, STEP-6 (IQU$DTM registration with BIS) must be done on S-2 as outlined in the I-QU PLUS-1 installation guide.

Chapter 12: Applying Changes to I-QU PLUS-1

If any changes are to be applied to either the generation skeletons or any of the system components (i.e., you have received a fix, not included in the release, from KMSYS Worldwide), this chapter should be consulted before starting the COMUS BUILD; otherwise, you will not need this chapter.

12.1 COMUS Change Format

The following procedure can be used if the fix you receive is in COMUS change format, ready to be applied to I-QU PLUS-1 using the COMUS batch insert before the BUILD (this is accomplished by simply adding the change element):

```
▶@qual qkms
▶I:002333 QUAL complete.
▶@comus iqu
▶COMUS 6R6A 1999 Aug 26 Thu 1600:40
▶COMMAND ?   ▶@add pf.iqu/chg
▶************** CHANGE KMS00001 INSERTED IN DATABASE
▶UPDATING ACCESS FILES ...
▶ACCESS FILES HAVE BEEN UPDATED
▶INSERT TASK COMPLETED ************************
▶demand
▶INSERT IQU CHANGE (SITEID = KMS) SCREEN MODE ?  ▶exit
▶END COMUS
```

12.2 TCF Change Format

If the fix you receive is in TCF format and not COMUS change format, you can use the following COMUS full-screen INSERT to apply the change:

```
▶@qual qkms
▶I:002333 QUAL complete.
▶@comus iqu
▶COMUS 6R8D (060816 1323:09) 2007 Apr 18 Wed 1321:58
▶Copyright (c) 1995-2006 Unisys Corporation.
▶COMMAND ?    ▶insert
▶INSERT IQU CHANGE (SITEID = KMS) SCREEN MODE ?  ▶
```

Simply transmitting on the previous query will place you in full-screen mode. All the required information is filled in as is shown in the following example: Once the change has been properly documented on the previous screen, the actual code can be applied. Here it is shown coming from an element in a program file:

```
** CHANGE **     PRODUCT :  IQU            CHG-NUMBER :
PROGRAMMER  :  I-QU PLUS-1 Installer      CLASS1     :  fix
APPLY-START :                             STATUS     :
APPLY-END   :                             APPLIES-TO :
MERGE-SEQ   :
REL-CHANGES :
UCFS        :
FEATURE     :
KEYWORDS    :  example

DESCRIPTION :  This is an example of a COMUS full-screen INSERT with
               the change having been placed in the TCF formatted
               element:

                           iqupf.iqu/tcf

                                                    COMMAND (I,R,C,D) :
                  FIELDS MARKED WITH ▮ MUST BE FILLED IN
```

```
▶CODE           :▶@add iqupf.iqu/tcf
▶CODE           :▶
▶************** CHANGE K0001284 INSERTED IN DATABASE
▶UPDATING ACCESS FILES ...
▶ACCESS FILES HAVE BEEN UPDATED
▶INSERT TASK COMPLETED ************************
▶INSERT IQU CHANGE (SITEID = KMS) SCREEN MODE ?  ▶list
▶LIST IQU CHANGE ?    ▶select num=k1284
▶#1 NUM : K0001284 SELECT LIST: 1
▶LIST DIRECTIVE ? ▶cview 1
```

Also, notice that it was decided to display the change in the COMUS database by using the COMUS commands: LIST, SELECT and CVIEW. The following is a sample of how the output screen might appear:

```
CHG-NUMBER      : KMS01284      STATUS      : TEST
KEYWORDS        : EXAMPLE
DESCRIPTION     :
          This is an example of a COMUS full-screen INSERT with
          the change having been placed in the TCF formatted
          element:

                     iqupf.iqu/tcf
ELEMENTS        : ELEMENT
PRODUCT         : IQU           ORG         :               DATE        : 18 JUN 07
CLASS1          : FIX           UPDATE-NUM  : 0             UPDATE-DATE: 18 JUN 07
CLASS2          : MINOR         INT-LEVEL   :               INT-DATE    :
CLASS3          : MAJOR         APPLY-START:                APPLY-END   :
STATUS          : TEST          MERGE-SEQ   : 000
SORT-SYSNUM     :
FEATURE         :
PROGRAMMER      : I-QU PLUS-1 INSTALLER
LINES OF CODE   : 3
CODE            :
:*ELEMENT
:-1000,1000   element
:          first code line at 1000
▶VIEW DIRECTIVE ? ▶
```

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