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# **SIRXREF User's Guide**

**(User Language Procedure Cross Reference Facility)**

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*Proprietary Notices*

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**Model 204™** is a proprietary product of Computer Corporation of America:

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Version 5.0



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**CHAPTER 2**    *Copyright Notice*

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**CHAPTER 3** *Trademarks*

Model 204 is a trademark of the Computer Corporation of America. ISPF is a registered trademark of IBM.



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**CHAPTER 4** *To the Reader*

Who should read this manual:

User's Guide to UL/SPF is directed at programmers, file managers, and system managers who use UL/SPF as an interface to the Computer Corporation of America's (CCA's) Model 204 environment. You should already know how to use the Model 204 environment, including how to edit and execute procedures, create and edit files and data sets and maintain the Model 204 dictionary. You should be familiar with Model 204 terminology and User Language, and know how to install utilities and features (such as UL/SPF) on your system.

## **4.1 Other manuals you should know about**

Model 204 File Manager's Guide

Model 204 User Language Guide

Model 204 Command Reference Manual

These manuals are part of the documentation for the Model 204 environment and are available from the Computer Corporation of America, Cambridge, MA.

UL/SPF Installation Guide    Sirius Functions Installation Guide

These manuals are available from Sirius Software.



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**CHAPTER 5**    ***Introduction to UL/SPF***

UL/SPF represents a family of products integrated as a set of Application Subsystems (APSYs) in a Model 204 online. Each can be run independently, or as a part of the UL/SPF framework.

UL/SPF is a full-screen menu-driven productivity facility designed to work as an interface to the Model 204 environment. Like IBM's ISPF facility, UL/SPF provides a user interface that lets you interact with Model 204 by selecting options from a series of menus instead of entering commands directly to Model 204. UL/SPF bypasses many restrictions and enhances the capabilities of Model 204, allowing you to perform tasks that were previously impossible or prohibitively time-consuming.

UL/SPF makes extensive use of specialized \$functions that allow for small high performance User Language procedures. It is the goal of Sirius Software to continue developing and refining these functions so that UL/SPF provides the highest levels of productivity and performance with the smallest possible impact on the users' computing environments.

UL/SPF offers these features:

User Language Cross-Reference Tool (SIRXREF)    File Monitor (SIRFILE)  
Performance Monitor (SIRMON)    User Language Developers' Environment (SIRPRO)  
Change Management System (SIRLIB)    Model 204 Journal Scanner (SIRSCAN)

This manual describes the Cross-Reference (SIRXREF) subsystem, and how to access and interpret the cross reference data.

## **5.1    Access and Security**

While UL/SPF greatly enhances a developers' abilities to accomplish programming tasks, UL/SPF does not interfere with security or access schemes as defined for users through Model 204's security facilities. *All file and subsystem accesses, and command privileges are available in accordance with a user's previously defined privilege settings.*

## 5.2 Using the UL/SPF screens

To move from screen to screen and to bypass menus and screens in UL/SPF, follow the instructions below:

If you want to:

You may:

Select an option from the menu

On the command line, type the number that corresponds to the option and press **ENTER**

Jump to the Main Menu from any screen

On the command line, type =M and press **ENTER**

Jump directly to an option not listed on the current menu and perform a task there

On the command line, type = and the number corresponding to the menu path you want to follow, separating the numbers with a period (.). For example, typing =4.1 and pressing **ENTER** will take from the current screen directly to the Procedure Editor screen. This is called “fastpathing”.

To Move between fields within a screen

Press **TAB** or **RETURN**

Leave UL/SPF from any screen

On the command line, type =X, then press **ENTER** (Exit)

Leave any screen and go to the previous level

Press **PF3** (Quit)

Obtain more information about the screen you are viewing

Press **PF1** (Help)

Execute an option or command on the Command or Option line

Press **ENTER**

## 5.3 Programmed Function (PF) keys

In addition to the command sequences and the PF keys described above, you can use PF keys and other keys to move around UL/SPF:

**PF1**

Get help for the current screen

**PF2**

Sort a procedure list by proc name (when displayed)

**PF3**

Leave the current screen and return to the previous level

**PF4**

Sort a procedure list by user id (when displayed)

**PF5**

Sort a procedure list by date/time (when displayed)

**PF6**

Sort a procedure list by size (when displayed)

**PF7**

Page up

**PF8**

Page down

**PF9**

Repeat the last command

**PF10**

Refresh

**PF11**

Toggles between upper and lower case in the editor procedure selection list panel.

PF12

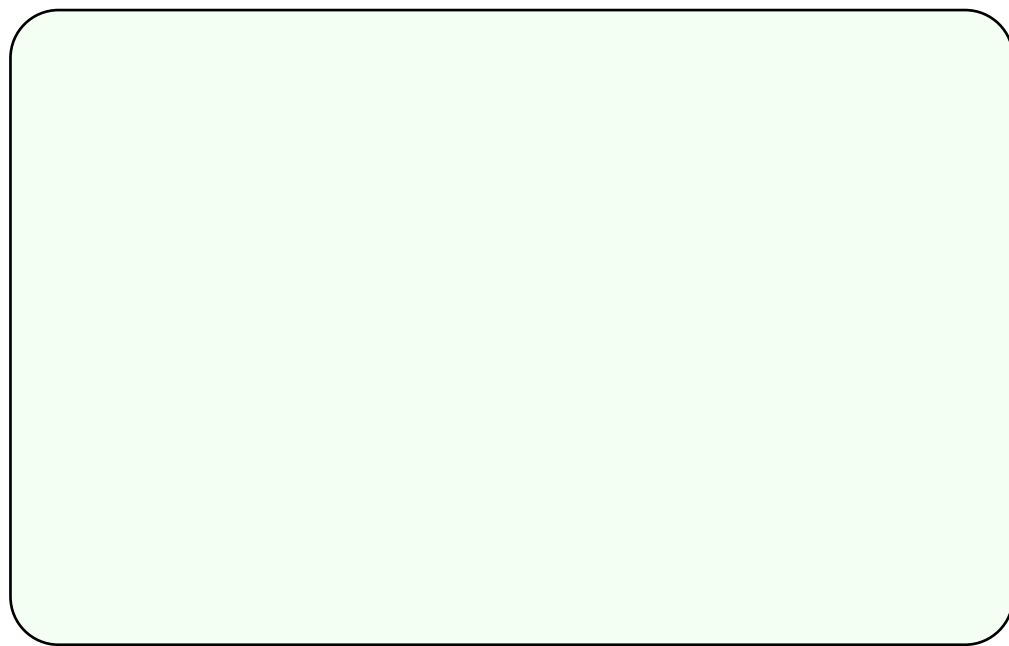
Execute the command or transaction

?

View a selection list corresponding to the field

## 5.4 Selection Lists

If you do not know the names of items requested on input panels (such as files or procedures) you can usually select the items from lists that UL/SPF displays. To view a selection list for an item requested on an input panel, type ? in the field. When you finish supplying information in the remaining fields, press **ENTER**. UL/SPF displays a selection panel like the one below.



**XRF40RFS.SCT**

Fig. \*number\* File Selection Panel

To select an item, type S in the Select column (SEL), next to the desired item.

### 5.4.1 Selecting Files

If you are selecting a private or semi-public file you may enter a password in the input field to the right of the file name. Password input is invisible.

The file selection panel also contains a FILE DESCRIPTION field, which contains a short description of the procedure file from METADATA. The Dictionary Administrator enters the file description through CCA's Document Facility (a CCA Workshop tool).

### **5.4.2 Selecting Dependent Items**

Because you can view lists for more than one type of item from a given input panel, you need to select them in a certain order. For example, you can view lists for both files and procedures, but the list of procedures that UL/SPF displays depends on the file(s) selected. In such cases, when you press **ENTER** to leave the input panel, UL/SPF first displays the File Selection Panel. After you select a file and press **ENTER**, it displays the Procedure Selection Panel, which contains a list of all procedures for that file, in accordance with current user privileges. To select a procedure, follow the directions specified for selecting files.

Procedure names displayed in selection lists are limited to 30 characters. Procedure names that exceed 30 characters are highlighted and terminated with an asterisk (\*) to indicate that the displayed names are not the actual procedure names.

## **5.5 UL/SPF error messages**

When an error occurs during processing or a warning condition arises, UL/SPF display an error message on the menu/screen you are using. The message appears in the bottom-right portion of the menu just above the PF key description, replacing the line that is normally displayed as a series of dashes.

## **5.6 Starting work in UL/SPF**

To start UL/SPF, type ULSPF on the command line of your terminal and press **ENTER**. UL/SPF displays the UL/SPF System Main Menu. To start performing tasks with UL/SPF, select the appropriate option from the main menu.



## *Summary of the User Language Cross-Reference Facility*

Both the cross-reference facility and its query functions are APSY applications that are accessible from the online Model 204 region. Optionally, the cross-reference process itself can be a set up as a batch only process without impacting the query facility.

Procedure Cross-Reference - SIRXREFX generates a cross-referenced listing of User Language procedures. It can output a listing of all included (imbedded) procedures that maintains a numerical count of physical and logical lines, and highlight code extracted from the imbedded procedures.

The cross-reference captures the innermost procedure name on a per-entity basis. This lets users query about the relationship between vital procedure and data base components used by each procedure. Approximately 20 major entity types are stored in the data base. The procedure/entity query process highlights the most important User Language elements, including:

- %variables    field names    statement labels    screens
- globals    files    commands    functions

These same items can be stored in the Model 204 dictionary provided by CCA. Dictionary updating is available as an option in both the online and batch cross-referencing. An option is available in the UL/SPF Administration panels which allows the system administrator to decide whether detailed line references are to be stored in SIRXREFD, or to compress the records (stored without the reference line data). By default, the detailed line references are not stored.

Procedure Analysis - SIRXREF maintains a directory of critical procedure information. Such information can help analyze file maintenance alternatives, for example, by identifying all procedures that access a particular file, field, or screen. Procedure Analysis output can help application managers evaluate the impact of data base and application changes and assist them in controlling the data base environment.



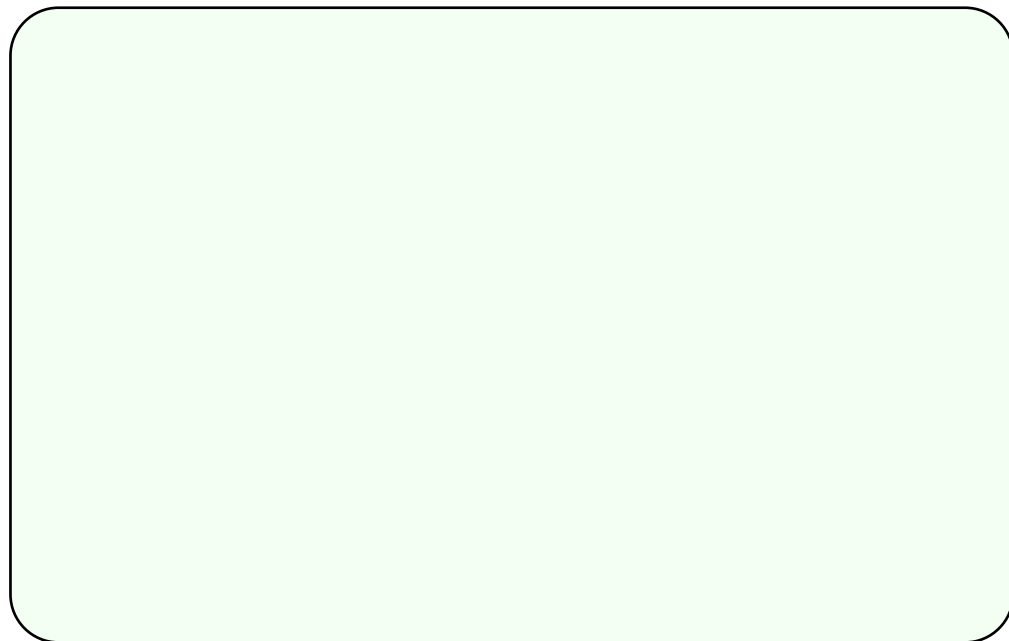
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**CHAPTER 7**    *Using the Cross-Reference Facility*

The Procedure Management Subsystem, SIRXREFX, gives programmers and data base administrators the ability to document applications with greater detail, improving the maintenance characteristics of the application by helping to determine the impact of file and procedure changes.

SIRXREFX analyzes procedures, produces cross-reference listings, loads the Model 204 dictionary with critical procedure-to-entity relationships, while SIRXREF fully supports the reporting of these relationships from the dictionary. The cross-reference facility forms the foundation of the Procedure Management subsystem. The cross-reference process starts by “registering” a procedure in the Cross-Reference Data Base (SIRXREFD).

To use the Procedure Management subsystem to register and document procedures, select Option 2 (User Language Cross-Reference Tool) from the Main Menu, or type SIRXREF from the Model 204 command prompt. UL/SPF then displays the Procedure Management Main Menu:



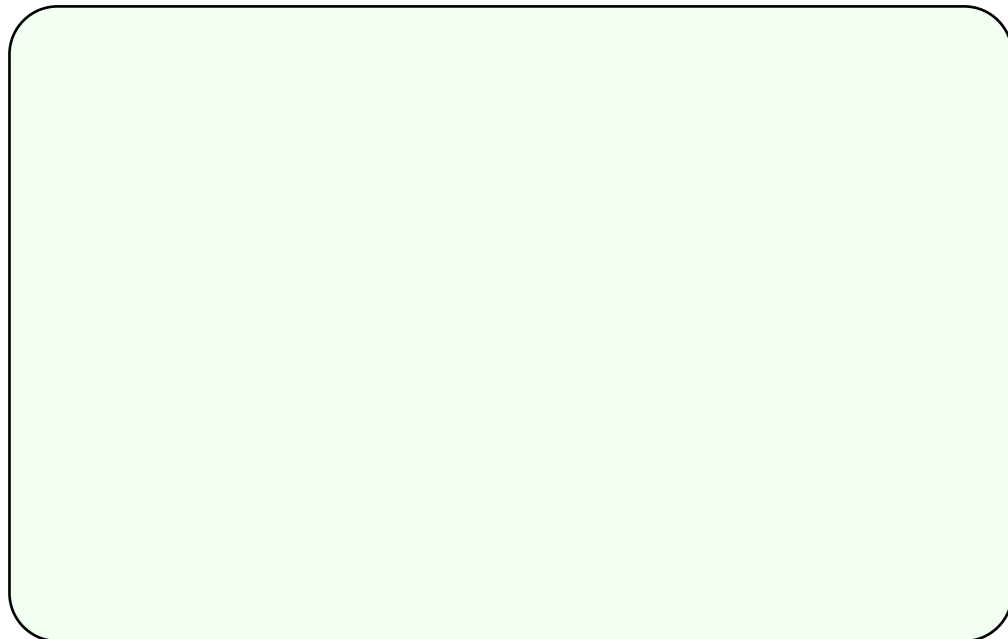
**XRF40RPM.SCT**

Fig. \*number\* The Procedure Management Main Menu

## 7.1 Registering Procedure Information

In order for cross-reference activities to function, procedures must be loaded into the Cross-Reference Data Base ( SIRXREFD). When a procedure is cross-referenced by UL/SPF, the contents of each User Language statement are parsed for file context and usage details.

To specify the file and procedure(s) to cross-reference, select Option 1 (Cross-Reference Procedures) from the Procedure Management Main Menu. UL/SPF displays the Cross-Reference Procedures screen. In this panel you input the procedure file names and DUMMY STRING values for procedure files (if any). DUMMY STRING substitution for data files is handled separately, and is discussed later in this section.



**XRF40RP0.SCT**

Fig. \*number\* The Cross-Reference Procedures Screen

## 7.2 Using the Cross-Reference Procedures Screen

The following options are available on this screen.

- To view a list of available items for an input field (for example, a list of file names), type ? in the field. When you press **ENTER**, UL/SPF displays a list from which you may select.
- To specify names containing matching strings, use a wild card (\*), for example, \*XYZ, XYZ\*, \*XYZ\*.

Supply values in the fields shown, as described below:

### FILE NAMES

The primary and supporting file names for the Model 204 procedure you are cross-referencing. To view a list of available files, type “?”. When you finish supplying information in the remaining fields, press **ENTER**. UL/SPF displays the “Select Procedures To Be Cross-Referenced” panel. For more information on selecting files, see “Selecting Files “ and ”Selecting Dependent Items“.

### DUMMY STRINGS

This input field refers only to dummy string values for procedure files. Dummy strings used for data files are discussed later in this section and should not be entered in this screen.

Enter the dummy string name (?&variable) that is used in place of the procedure file name, exactly as it appears in the User Language procedure to be cross-referenced. The cross-reference program must be able to accurately substitute the real file name so that the expanded code can be fully assembled and referenced. The entire name must be entered in the DUMMY STRING input column precisely as it appears in the User Language procedure, including the “?&” prefix. Sample input may look like ?&ABCD or ABC?&D.

If no secondary procedure file is provided, but the procedure opens a secondary file to read included code, the cross-reference will fail. The subsystem must know the secondary procedure file names and the user must have “read” access to them.

### PASSWORD

The password corresponding to each file, if needed.

### PROCEDURE NAME

The procedure name in the primary file that will be cross-referenced. To view a list of available procedures, type ?. UL/SPF displays the Procedure Selection Panel with a list of procedures for the file name specified. When you finish supplying information in the remaining fields, press **ENTER**. For more information on selecting files, see “Using Selection Lists” in Chapter 1. Wild card searches are also allowed for the procedure name field.

### ENVIRONMENT

The mode in which the cross-reference procedure executes. Specify 1 for on-line execution (the terminal will be locked for the duration of the execution). Specify 2 for BACKGROUND, which uses IODEV3, executing SDAEMON LONG. The terminal is freed as soon as the job is submitted. The user will be notified when the job completes.

### UPDATE CCA DICTIONARY

To store the procedure information in the Model 204 Dictionary, specify Y. UL/SPF stores specific cross-reference information related to file, field, functions, etc. in the Model 204 dictionary for future reporting and change control management. The default is N.

### PRINT XREF LISTING

To print a Cross-Reference Listing, specify Y. The default is N. Note that the cross-reference process will run much more quickly if you do not choose this option.

### INCREMENTAL XREF

If this option is selected by entering Y, the subsystem looks at all the records specified in the primary procedure file. It compares the date the procedure was last modified against the last cross-reference from SIRXREFD using RECID=CNTRL. If the procedure examined is an outermost procedure, the entire procedure is completely cross-referenced. If the procedure examined is an included procedure, then all of the outermost procedures that included it will be completely cross-referenced; in this manner, the dictionary (the SIRXREFD file) will always be up-to-date.

### DESTINATION OF LISTING

The DDNAME of the output specification. Use the following syntax:

To local printer To VTAM printer To a data set

\$PRINT CLASS=X PRINT QUEUE XXXX (the printer must have the VTAM printer support option) OUTXXXX

### LINES/PAGE FOR LISTING

The number of lines to be printed or displayed per page. The default is 66 lines per page.

### LINE LENGTH FOR LISTING

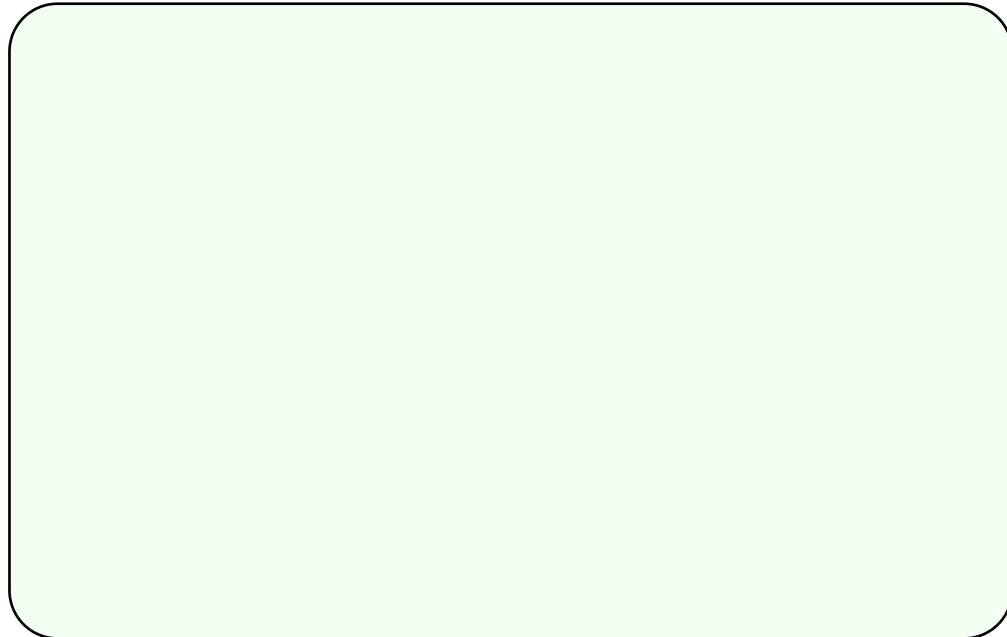
The number of characters to be printed or displayed per line. The default is 133 characters per line.

When you press **ENTER**, UL/SPF displays the appropriate selection panels for any required input fields left blank. If all required information was supplied, UL/SPF performs the Cross-Reference analysis and stores the resulting data in SIRXREFD and, optionally, in METADATA and DATALINK.

Performing the cross-reference online, whether at the terminal or via the SDAEMON, requires a 480K byte server. If no such server exists in your online, the cross-reference must be done in batch mode.

### 7.3 GLOBALS: Substituting Dummy Strings for Data File Names

Pressing **PF10** advances you to the “Global Substitution Panel for XREF,” displayed below. This panel allows you to input the ?&variables that are used for data file names in the file/procedure that is to be cross-referenced. You may at this point enter the real file name for each of the dummy string values entered.



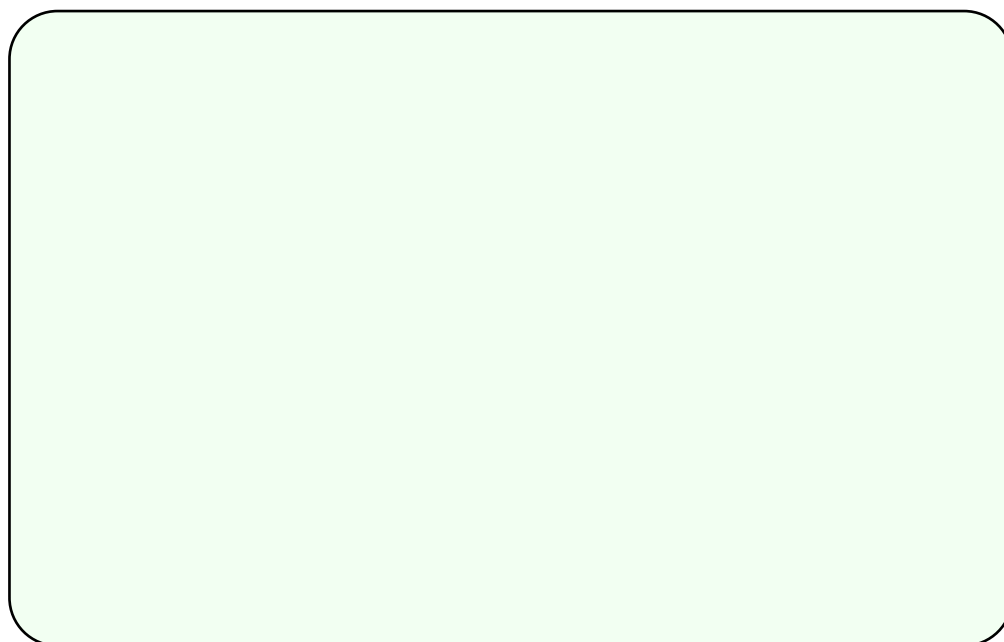
**XRF40RG1.SCT**

Fig. \*number\* Global Substitution Panel For XREF

During the cross-reference process, the dictionary files and SIRXREFD will be updated to reflect both the file and dummy string reference data. Pressing **ENTER** from this screen returns you to the prior screen, and saves the global substitution input. Pressing **PF3** cancels your input and any prior input will be preserved. Bypassing this panel leaves the dictionary unaffected and only the dummy string literal (as it appears in the code) is recorded in METADATA, DATALINK, and SIRXREFD. In any event, data entered on this screen and the prior screen is preserved across screen displays for future reference.

### 7.4 Confirming a List of Procedures to Cross-Reference

When cross-referencing multiple procedures, you will be asked to confirm your selection. Press **PF12** to confirm your selection and begin Cross-referencing, or press **PF3** to cancel. The following screen is a sample of the confirmation screen.



**XRF40RP7.SCT**

Fig. \*number\* Confirmation of Cross-Reference

NOTE: The character string '\*'// in the input User Language causes the Cross-Reference report to page break. Page breaks in procedures can improve the clarity of the listing by physically separating major segments of the code.

## **7.5 Cross-Reference Data Types and Files**

When the Model 204 dictionary is loaded with data from the Cross-Reference analysis, you can report on the relationships between procedures and other Model 204 entities. The type of dictionary entities that are stored in the Model 204 dictionary and the supplemental data stored in the SIRXREFD are depicted in tables 1, 2, 3, and 4.

The supplemental dictionary relationships are not tracked in METADATA and DATALINK. This avoids burdening the Dictionary Administrator with the task of updating and maintaining the dictionary with the supplemental entities when new releases of the dictionary are provided by CCA.

The following items are available in the standard queries currently provided by UL/SPF. All the queries are driven by data extracted from SIRXREFD.

Files    Groups    Fields    Included procedures    Global variables  
\$FUNCTIONS    Commands issued before a BEGIN and after an END including:

RESET LOGON INCLUDE DISPLAY FREE OPEN

UTABLE LOGIN I D INCREASE OPENC

CREATE LOGOUT DELETE DEFINE DECREASE O

USE CLOSE T REQUEST REDEFINE EDIT

U ALLOCATE TIME REQUEST PARAMETER E INITIALIZE

### **7.5.1 Entity Data Stored in the Model 204 Dictionary**

The following items are optionally stored in the DATALINK file. Corresponding entries are made in METADATA if the entity has not already been defined to the dictionary.

Table 1 Dictionary Entries for REFTYPE = ~USES

PROC PROC PROC PROC

====> ====> ====> ====>

FILE GROUP FIELD GLOBAL

Table 2 Dictionary entries for REFTYPE = ~INCLUDES

PROC

====>

PROC

### **7.5.2 Entity Data Stored in the UL/SPF SIRXREFD**

The following items are stored in the Cross-Reference file ( SIRXREFD) for both the standard and supplemental dictionary entities. This file maintains not only “procedure-uses-entity” relationships, but also tracks detailed information about how the an entity is used in the procedure. The record identification field for the SIRXREFD is called REC.ID, and its possible values are shown below.

Table 3 Procedure to Entity Relationships Tracked by REC.ID in SIRXREFD

Entity

====>

Entity

====>

REC.ID

PROC PROC PROC PROC PROC PROC PROC PROC PROC PROC PROC PROC PROC PROC  
PROC PROC PROC PROC

====> ====> ====> ====> ====> ====> ====> ====> ====> ====> ====> ====> ====> ====>====>  
====>

FILE FIELD GROUP PROCEDURE COMMAND \$FUNCTION %VARIABLE SCREEN  
MENU GLOBAL STRING LABEL SUBROUTINE LIST PROCESS IMAGE

====> ====> ====> ====> ====> ====> ====> ====> ====> ====> ====> ====> ====> ====>====>  
====>

FILE FIELD GROUP INC COMMAND KAN PER SCREEN MENU GVAR SVAL LABEL  
SUB LIST PNAME IMAGE

### **7.5.3 Other Entity Relations**

The Procedure file to procedure relationships are reported as part of each Procedure Cross-Reference query. The PROC FILE to PROCEDURE relationship can be derived from the PROC.ID field, which is a concatenation of the procedure file name and the procedure name.

UL/SPF is also capable of providing subsystem trace reports. This type of information is kept current with each incremental cross-reference of the procedures.

Table 4 Other Entity Relations Stored in SIRXREFD

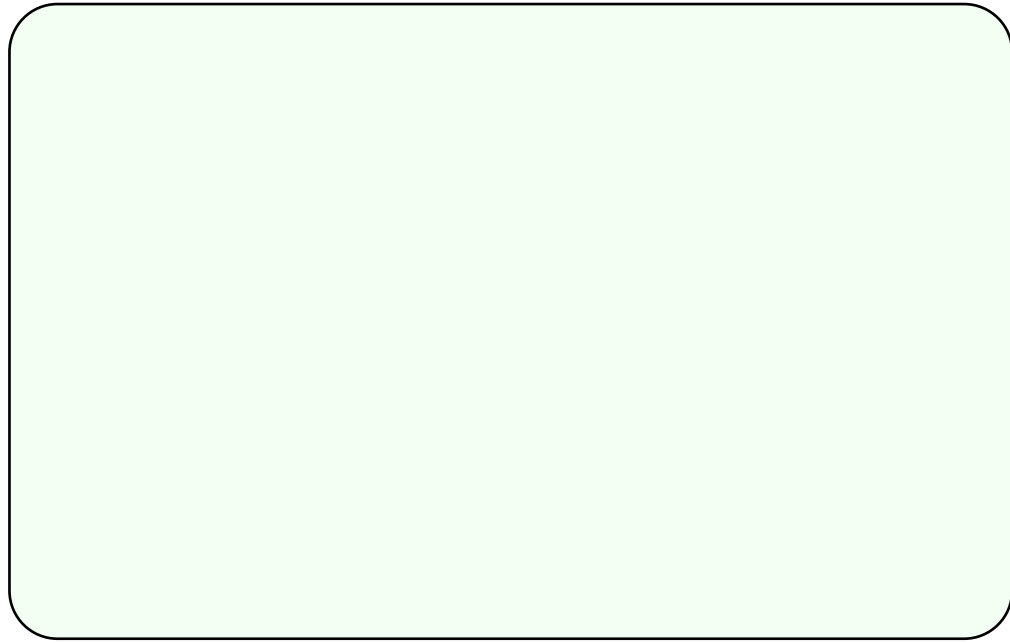
PROC FILE SUBSYSTEM

====> ====>

PROC PROC

## **7.6 Procedures to Entities Relationships**

To begin reporting on these relationships, select Option 2 (Procedure To Entities Relations) from the Procedure Management Main Menu. UL/SPF displays the Procedure Reference Screen.



**XRF40RP1.SCT**

Fig. \*number\* The Procedure Reference Screen

Supply values in the following fields, as described below:

**FILE NAME**

The M204 procedure file name.

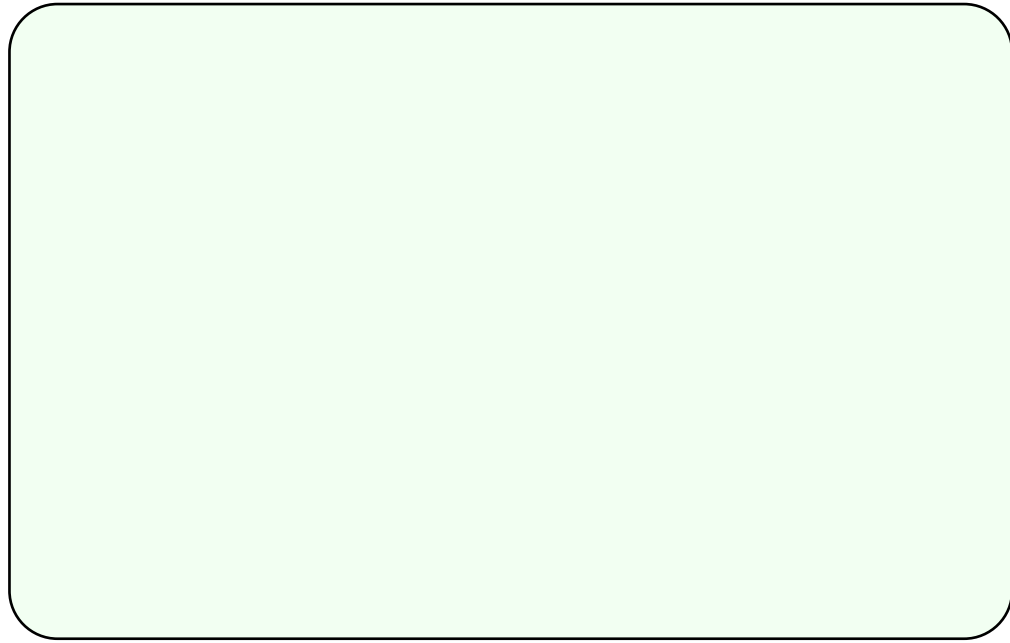
**PROCEDURE**

The procedure name contained in the file. To view a list of procedures contained in the file, type ?.

**ACCOUNT**

The logon ID of the person who last cross-referenced this procedure. NOTE this is NOT the logon ID of the person who last UPDATED the procedure.

When you press **ENTER**, UL/SPF displays the Display Item Select Screen.



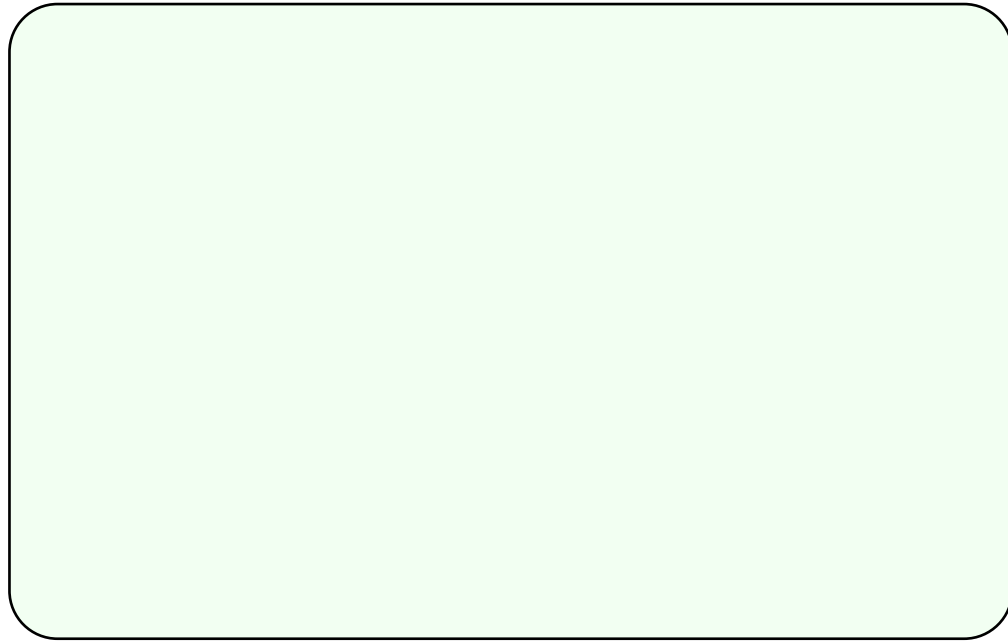
**XRF40RP2.SCT**

Fig. \*number\* The Display Item Select Screen

To report on the relationship between the selected procedure and another entity, select the appropriate option from the Display Item Select Screen. For example, to see what functions a procedure uses, select Option 7 (Referenced Functions Display).

## **7.7 Reading the Report Output**

When UL/SPF finishes the search, it displays the report output. The following is a sample output that reports the functions used by the procedure PUNP-START. UL/SPF produces similar output for each type of cross-reference query.



**XRF40RP3.SCT**

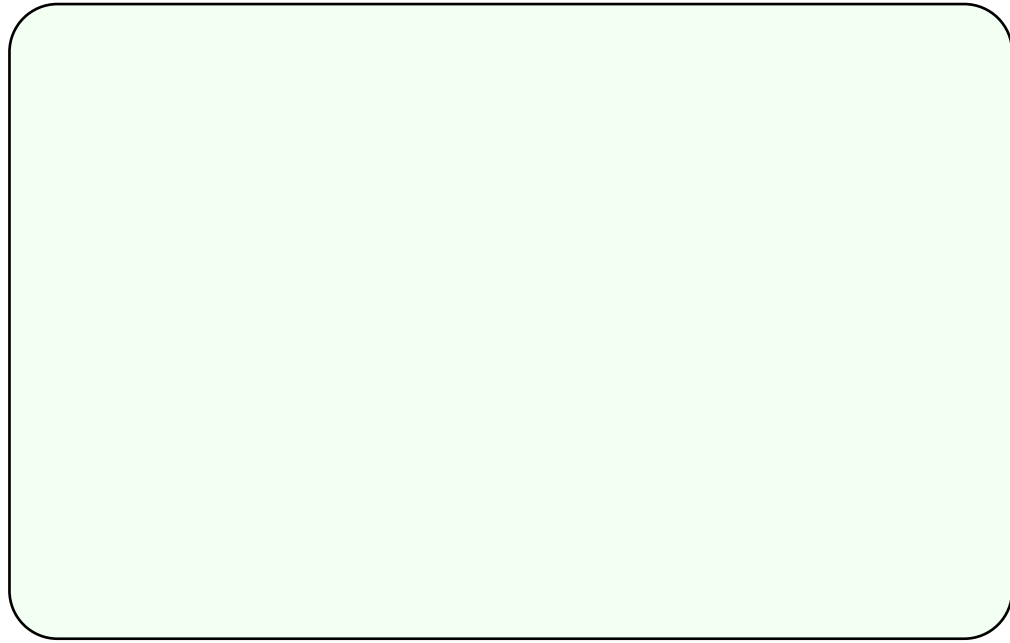
Fig. \*number\* \$functions used by a procedure (example).

## **7.8 Entity to Procedure Relationships**

To view all procedures that access a selected Model 204 entity (file, group, field, included procedure, global variable, command, or function), select Option 3 (Entity to Procedure Relationships) from the Procedure Management Main Menu. UL/SPF displays the Refer to Procedure Information menu.

Option 3 (Entity to Procedure Relations) is a Change Control/Management function that enables systems staff to evaluate the impact of changes to vital application components by clearly identifying the procedures that are affected by a proposed change.

NOTE: When you select Option 3, you can edit the procedures that UL/SPF lists by selecting them from the display list.



**XRF40RE1.SCT**

Fig. \*number\* Refer to Procedure Information Menu

To report on the relationship between an entity and procedures (for example, to see what procedures use a selected command), choose the appropriate options from the Refer to Procedure Information menu. When you press **ENTER**, UL/SPF displays the input panel for the option you selected. On the panel, you supply UL/SPF with information it will use to search the data base for the affected procedures.

## **7.9 Viewing the Report Output**

When UL/SPF finishes the search, it displays the report output. Following is a sample output that reports the procedures that use the specified file. The listing identifies the procedure that accesses the file and the file in which the procedure is stored. UL/SPF produces similar output for each type of cross-reference query.

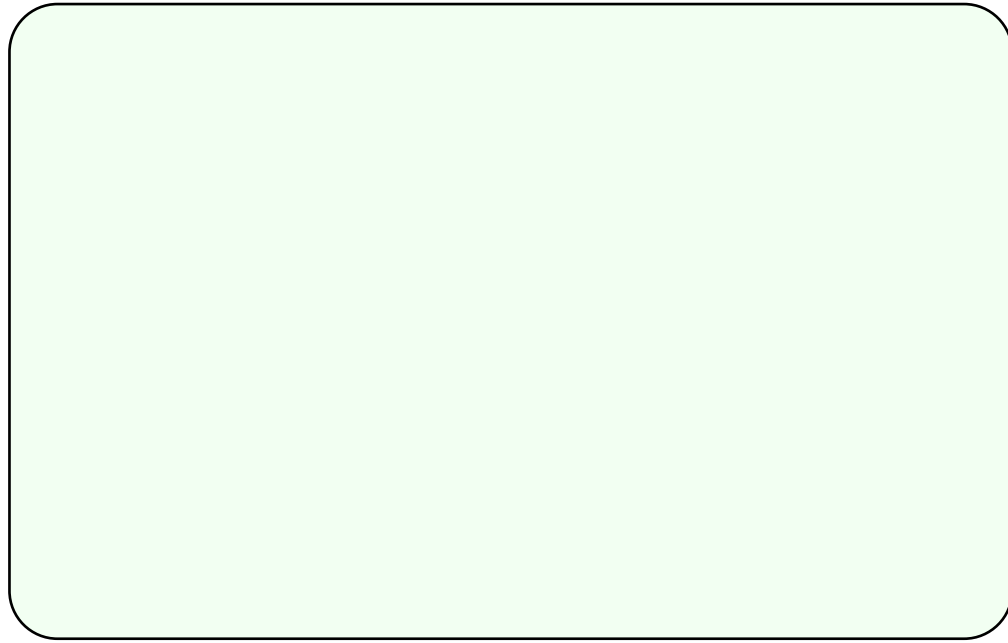
**XRF40RE2.SCT**

Fig. \*number\* Refers to Entity Example

## 7.10 Editing Procedures

SIRXREF provides an interface to the Model 204 full screen editor. This interface sits behind all the screens that present lists of procedures, such as the previous example screen that showed a list of procedures the referenced a particular file. From these procedure list screens the user may enter one of the following prefix commands to invoke a full screen edit.

S

Edit the procedure. The user session is transferred to the editor. When the edit session is ended, control is returned to this screen. The S command will fail if the source file is not public and/or not open, or if the selected procedure no longer exists in the file.

P

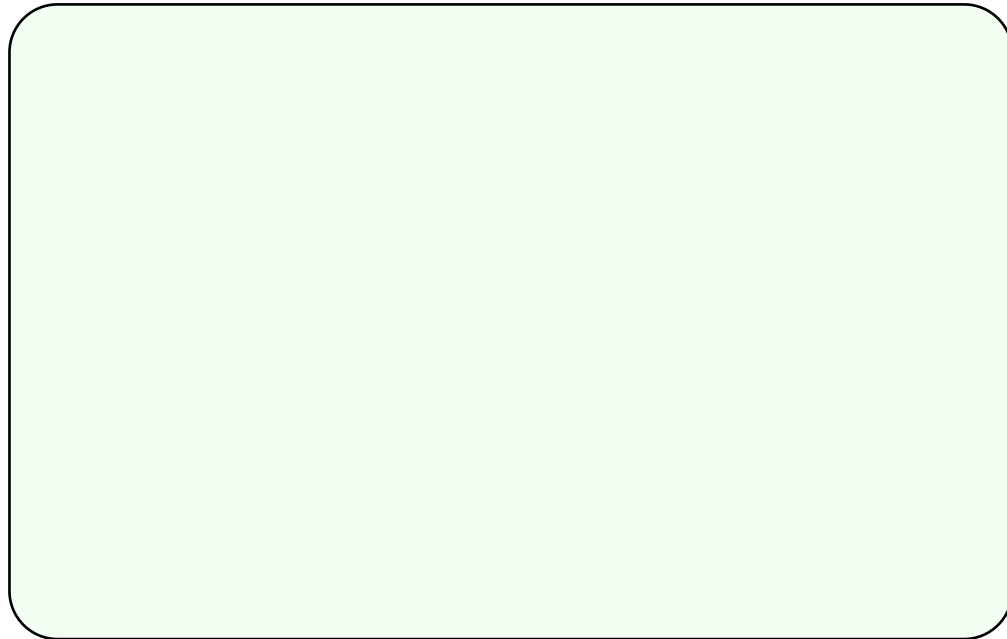
Prompt for a password before invoking the edit session. Use this command if the file is not open with edit privileges and you wish to enter the password.

E

Expand. This command converts the procedure list to a list that shows all the included procedure names under the outermost procedures. A procedure name is highlighted on this display if it contains the entity being investigated. **PF3** returns to the unexpanded list.

## 7.11 Tracing the Flow of a Subsystem

The cross reference database can also be used to trace the procedure flow for a subsystem. A thorough subsystem flow depends upon the complete cross-referencing of the subsystem's procedure file(s). Option 4 (Subsystem Flows) in the Procedure Management main menu presents the following input screen.



**XRF40RS1.SCT**

Fig. \*number\* Subsystem Trace Facility Screen

### 7.11.1 Generating the Subsystem Trace

You must provide the name of the subsystem to be traced, or enter a ? to view a list of available subsystem names from which to choose. The trace uses the data stored in CCASYS to identify the source procedure file name, the communications global variable name and the procedure prefixes for both non-precompiled and precompiled procedures. The system then searches SIRXREFD for the procedure prefixes and the global variable record ID. Your output may be directed to the terminal, a data set, or a printer to include VPS/204 printers as discussed previously.

The path is determined by identifying the communications global variable name and procedure prefixes stored in CCASYS for the selected subsystem, along with the initialization, log in, and error procedure names. Once these items are identified, the trace facility reads the Cross-Reference data in SIRXREFD for the selected procedures and locates all references to the communication global variable.

### 7.11.2 Reporting the Subsystem Trace

The report which is output from the trace facility is scrollable. It displays the subsystem control information in the report header along with the record type, procedure name, and calls made through the communications global variable. The valid record types reported include INIT for initialization, LOGON for logon, ERROR for the subsystem error procedure, and PROC, which identifies all other procedures.

The tag PROC.ID refers to the procedure that is referencing the communication global variable while CALLS identifies the procedure name(s) that may be called by this procedure. A sample listing of a trace report is displayed below.

NOTE: CALLS may refer to a specific procedure name, %variable, global variable, field name, etc. If the reference cannot be resolved because it is obscured by unusual coding structures, the literal “\*?\*?\*?\*?” will appear.



**XRF40RS4.SCT**

Fig. \*number\* Subsystem Trace Report Output

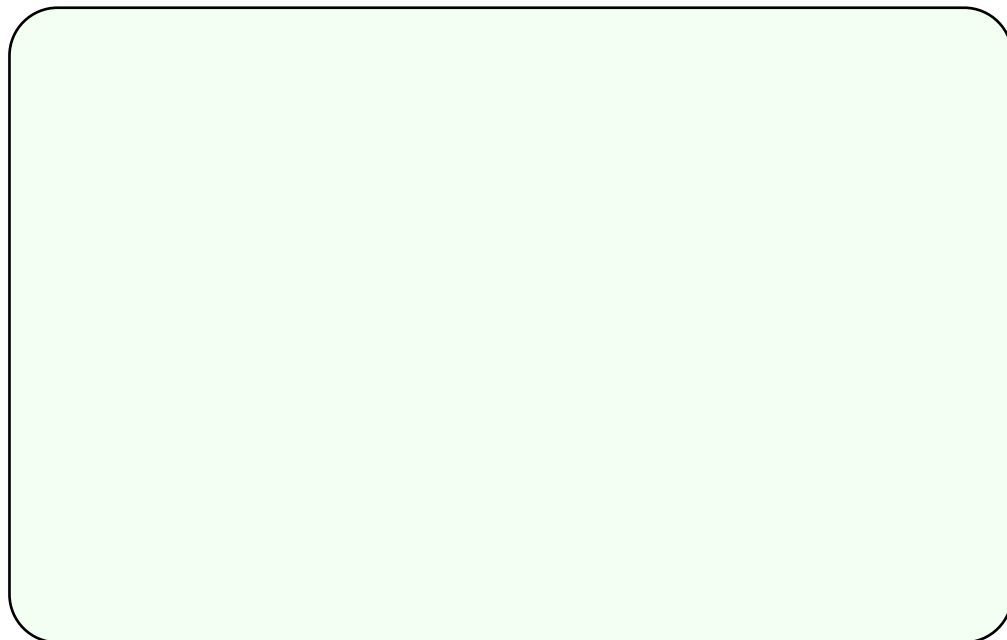
### 7.12 Maintaining the Cross-Reference Data Base

There are two aspects to maintaining the Cross-Reference data. UL/SPF loads one portion of the data into SIRXREFD, the Cross-Reference Data Base, which contains the detailed reference information. UL/SPF optionally stores the entity data and the general reference data in the CCA dictionary files METADATA and DATALINK. You must maintain entries in METADATA and DATALINK separately, since they may also be used by other CCA or locally developed applications.

### 7.12.1 Deleting Obsolete Procedure Information

Each time a file is cross-referenced, UL/SPF automatically deletes the entries stored in SIRXREFD. Alternatively, you can delete old procedure information manually. To do this, choose Option 5 (Delete Obsolete Cross-Reference Data) from the Procedure Management Main Menu. UL/SPF displays the Select Reference Data to be Deleted Screen.

NOTE: In order for the delete process to be successful, you must have already processed the target procedure through the Cross-Reference Facility.



**XRF40RPR.SCT**

Fig. \*number\* Procedure Reference Screen

Supply values in the fields shown, as described below:

FILE NAME

The M204 procedure file name.

PASSWORD

The password corresponding to the file, if needed.

PROCEDURE

The procedure name for the file. To view a list of procedures for the file, type ?.

ACCOUNT

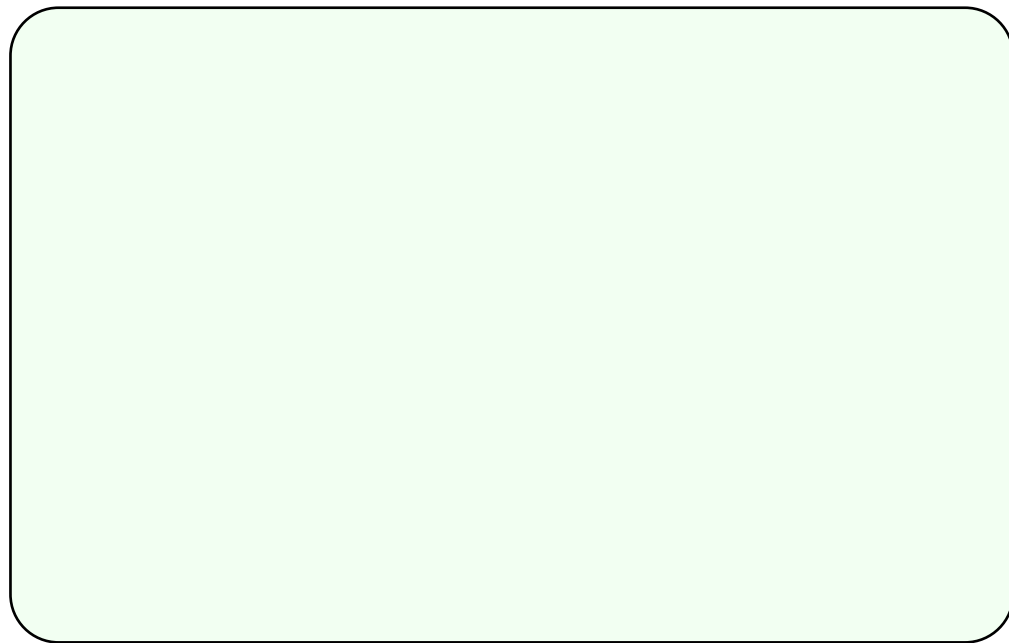
The logon ID of the person who last cross-referenced this procedure.

When you have finished specifying the procedure, press **ENTER** to begin the deletion process. If you are using a selection list, press **PF12** to begin the deletion process. Only those procedures selected from the list will appear on the confirmation screen. The confirmation screen is scrollable. UL/SPF deletes the selected data from SIRXREFD.

**NOTE:** This procedure can be long-running; there is no limit to the number of deletions that can be processed.

### **7.12.2 Deleting Obsolete Reference Information**

To delete specific reference items from the Model 204 dictionary, choose Option 6 (Delete Obsolete Dictionary Data) from the Procedure Management Main Menu. UL/SPF displays the Delete Obsolete Dictionary Data Menu.



**XRF40RD1.SCT**

Fig. \*number\* Delete Obsolete Dictionary Data Screen

Choose a category by typing the appropriate number on the command line. Optionally, you can also supply values in the fields shown, as described below:

**FILE, GROUP, OR GVAR NAME**

The M204 file name, group name or global variable name to be deleted. Wild card specification is also supported.

**PROCEDURE OR FIELD NAME**

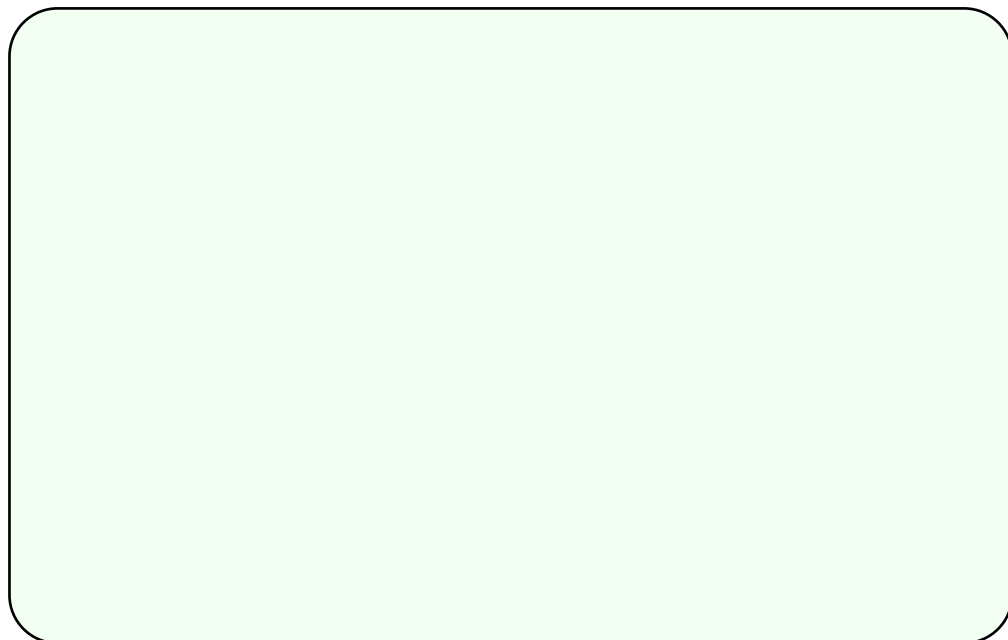
The procedure name or field name to be deleted. Leave blank or type ? to view a selection list. You must provide the file or group name and the procedure or filed name; the deletion must be performed in file context.

When you finish supplying information, press **ENTER**. UL/SPF deletes the entity information from METADATA and DATALINK. If you are selecting from a list, you may sort the list by field name, the update column (which indicates that the entity was added by UL/SPF), or date, using the PF keys displayed on the screen. Press **PF12** when UL/SPF displays the confirmation screen to confirm your selection. To terminate the deletion, press **PF3**.

### **7.13 BATCH204 Cross Referencing (MVS only)**

Option 7 provides a screen that allows the user to enter JCL information for the generation of a batch JCL cross-reference job. This generated JCL may be used to cross-reference the entire list of procedures in the file, or a selection of the procedures. The JCL can be customized and saved for further later use.

This process runs a BATCH204 job accessing files used by the on-line region. It is designed to run during non-prime hours, while the on-line region is unavailable. You begin the BATCH204 cross-reference by providing the job control data in the Procedure Xref Batch Submit Input Screen described below.



**XRF40RB1.SCT**

Fig. \*number\* Procedure XREF Batch Submit Input

The Job Card presented is taken from the user profile record (set via option 6 from the UL/SPF main menu). If no user profile was set up the Jobcard is taken from the system default information defined at ULSPF installation time.

Each time this function is accessed, the job card from the user profile is redisplayed.

#### PROCEDURE FILE NAMES

Enter the procedure file names for each of the procedure files used. The PRIMARY FILE refers to the Model 204 procedure file that contains the base User Language that is to be cross-referenced. The SUBRTN FILE refers to any subordinate procedure files that may contain included subroutines, common segments of code, screen definitions, etc.

#### DUMMY STRINGS

Enter the dummy string name (?&variable) that is used in place of the procedure file name, exactly as it appears in the User Language procedure to be cross-referenced. The cross-reference program must be able to accurately substitute the real file name so that the expanded code can be fully assembled and referenced.

Dummy strings used for data files (discussed in a previous section) should not be entered in this screen.

For each DDNAME you enter, you must also provide a valid Model 204 password and data set name. All of this information is used in generating the batch job. You will be alerted by an error message at the bottom of the panel if the DDNAME (or Model 204 file name) is not registered in the Dictionary. Press **PF11** (CHECKOFF/CHECKON) to toggle this edit on and off.

**NOTE:** If additional SUBRTN FILES need to be defined beyond the four inputs allowed, you may enter them and other pertinent job data in the edit step just prior to job submission.

The second Procedure Xref Batch Submit Input screen allows you to direct output and control the generation of the Model 204 commands used in the batch job. The screen is displayed below.

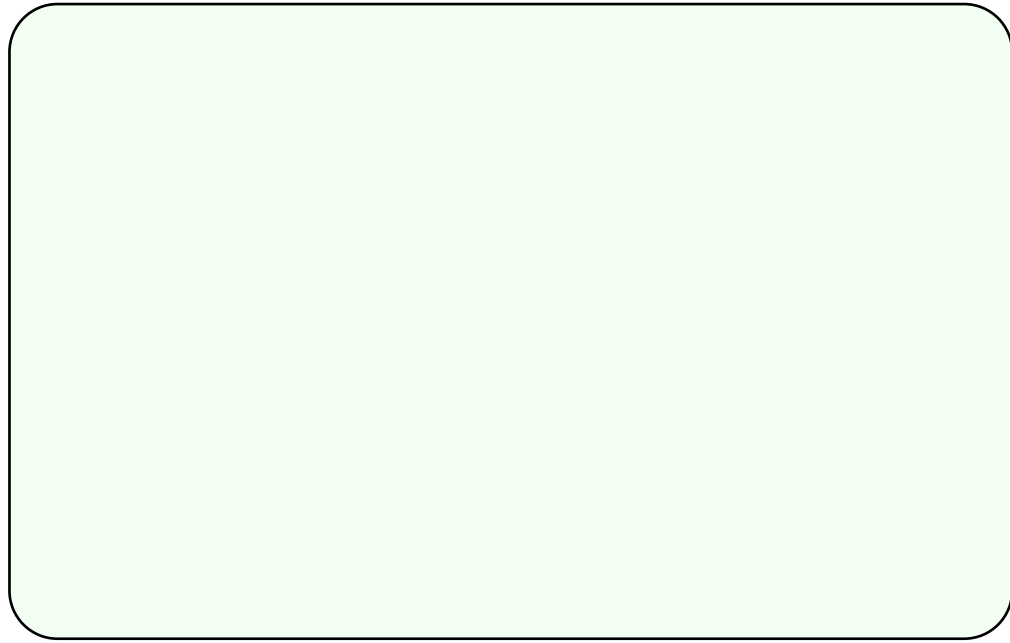
**XRF40RB2.SCT**

Fig. \*number\* Procedure XREF Batch Submit Input

**PROCEDURE FILE NAME**

This is the procedure file into which the JCL will be saved.

**PASSWORD FOR PROCEDURE FILE**

Supply the password needed, if any.

**PROCEDURE NAME**

Enter the procedure name.

**PRINT XREF LISTING**

The default for this input field is N. The default option DOES NOT save the Cross-Referenced listing; it is designed for users interested in loading the Dictionary and cross-reference file (SIRXREFD). If Y is entered, then you must select where your cross-reference listing goes (SYSOUT=\* or a data set). The default for the print destination is SYSOUT=\*. If you choose to output to a data set, keep in mind that each procedure will be fully expanded with included code and the Cross-Reference output, making the listing significantly longer than the original code. Your data set must be large enough to accommodate all of the output.

**M204 PASSWORD**

The batch job will sign on as the submitting user. You must provide a valid password that will grant the proper privileges, if SYSOPT is set to require logon.

### PROC/WILD CARD

The procedure name in the primary file that will be cross-referenced. Wild card searches such as XYZ\*, \*XYZ or \*XYZ\* are also allowed for the procedure name field. Multiple procedure names/wild cards are allowed. The default value is \*, indicating all procedures.

### INCREMENTAL UPDATE

If this option is selected by entering Y, the subsystem looks at all the records specified in the primary procedure file. It compares the date the procedure was last modified against the last cross-reference from SIRXREFD using RECID=CNTRL. If the procedure examined is an outermost procedure, the entire procedure is completely cross-referenced. If the procedure examined is an included procedure, then all of the outermost procedures that included it will be completely cross-referenced; in this manner, the dictionary (the SIRXREFD file) will always be updated.

### DICTIONARY UPDATE

If this option is selected by entering Y, the dictionary (SIRXREFD) will be updated.

### GLOBALS

Pressing **PF10** will advance you to the “Global Substitution Panel for XREF.” For more information, see “Globals: Substituting Dummy Strings for Data File Names” in the “Registering Procedure Information” section.

When you press **ENTER**, the Job Control Language and Model 204 commands are generated and you are placed in the Model 204 editor to verify the results and make additional modifications as required by your installation. When you are finished, type END in the command window, and you will be prompted to confirm the job submission by typing Y. If you type N, the job submission will be aborted and you will return to the initial batch submission input screen. You may choose to store the generated JCL and control information in a Model 204 procedure by specifying a valid file and procedure name. This option may be used for saving the JCL for reuse by transferring the procedure to and MVS sequential data set. This will allow you to modify and submit batch jobs using TSO/ISPF rather than submitting them from Model 204.



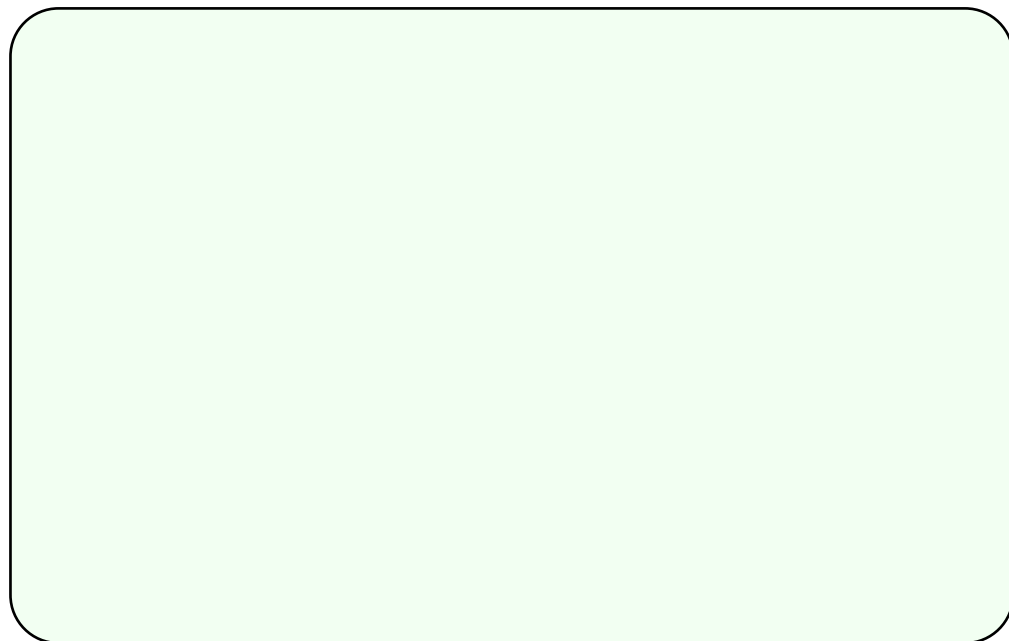
***User Profile updating***

The user profile is built dynamically as various options in the UL/SPF apsys are entered. Option 6 from the ULSPF main menu allows manual updating of the User Profile. Most of the options on the screen only apply to shops that use SIRPRO, however the JobCard and 2 optional lines of JCL should be maintained for users generating Batch204 cross-reference jobs.

The job card information is used whenever UL/SPF generates a BATCH204 job control “deck” for the host system (MVS version only). Verify that you have entered all JCL parameters required by your installation including passwords, /\*MAIN cards, /\*ROUTE cards, etc. The batch job will fail if it does not have a correct job card.

If your installation has different requirements for BATCH2 and BATCH204 JCL, enter the BATCH2 job control information through the user profile screen. You are given the opportunity to alter the job card for the BATCH204 processing in the Procedure Cross-Reference Subsystem (the only BATCH204 process in UL/SPF). Modifying the JCL job control card for the batch cross-reference process will cause a secondary profile record to be created for you. This record will then be retrieved for all subsequent BATCH204 processing, while the original profile entry remains unchanged and will still be used for BATCH2 processing.

A sample User Profile Input Screen is presented below.



**XRF40RPF.SCT**

Fig. \*number\* User Profile Input Screen



## ***Appendix A: Cross-Reference Information***

The UL/SPF Cross-Reference Facility captures the innermost procedure name on a per entity basis. In addition, an option is available through the UL/SPF administration panel which allows the system administrator to specify whether detailed line references are to be stored in SIRXREFD, or if the records are to be compressed (stored without the field REF.LINE).

If cross-reference details are required to be stored in the data base, you must update UL/SPF through SIRADMIN and set the REF-LINE input field to "Y." This will cause SIRXREF to store the line number for reference to an entity in SIRXREFD. The default for this option is "N" because this type of data has no further use after the cross-reference listing has been produced. The one exception is for INCLUDE statements, which always have the REF.LINE field stored regardless of the SIRADMIN setting. (This data is used for producing graphical representations of include level nesting within a procedure).



---

**CHAPTER 10** *Accessing the Data*

The method employed by UL/SPF to store the innermost procedure name compresses the data as much as possible without increasing overhead for all other cross-reference processing. The innermost procedure name is stored once per procedure cross-reference. This control record (REC.ID = CNTL) contains the name of the outermost procedure, the include levels, and other relevant control data.

The name is compressed to a string of numbers that uniquely represent the included procedure within the cross-referenced outermost procedure. This saves Table B space at the expense of relatively infrequent cross-references to the control records for the actual procedure name.

The innermost procedure name may be accessed as outlined below:

- select a set of entities for processing from SIRXREFD based on REC.ID, PROC.ID and other necessary find criteria
- for each record in the found set created above, retrieve the value for the field PROC.LEVEL
- PROC.LEVEL is a string value that represents the procedure include level number; each level and include is a numeric value (e.g., “1” is the outermost procedure, “1.1” is the first included procedure, “1.1.1” is a nested include in “1.1.” etc.)
- retrieve this value from the REC.ID = CNTL in SIRXREFD for the current PROC.ID
- access the field NAME in this found set to obtain the innermost procedure name in the format filename:procname



---

 CHAPTER 11 *Sample Records*

In this sample, the innermost procedure name for the reference to the %variable is at PROC.LEVEL 1.3 which translates to the procedure control record shown. There is also a reference to the %variable in the outermost procedure as indicated by the PROC.LEVEL 1 control record.

+-----> +--> +--> +----->

```
REC.ID PROC.ID NAME PROC.LEVEL CDATE CTIME USER.ID REC.ID PROC.ID
NAME PROC.LEVEL CDATE CTIME USER.ID REC.ID PROC.ID NAME LEVEL
SUBROUTINE PROC.LEVEL PROC.LEVEL
```

```
= CNTL = TOOLPROC:PUPR-MENU = SCRNP:SCREEN.PU.PRMENU = 1.3 =
90079 = 192508 = M204 = CNTL = TOOLPROC:PUPR-MENU = TOOLPROC:PUPR-
MENU = 1 = 90079 = 192508 = M204 = PER = TOOLPROC:PUPR-MENU =
%PRMENU:COMMAND = 1 = ***MAIN*** = 1 = 1.3
```



---

 CHAPTER 12 *Running a Cross-Reference Report*

You may run a cross-reference report in ONLINE, BATCH2, BATCH204 or BACKGROUND. Each option allows the user to run one or many procedure cross-references by selecting the procedures individually, or by specifying a wild card string.

In the ONLINE and BACKGROUND modes, you may select the procedures from a list of procedure names. For BATCH204 and BATCH2, you specify the parameter as shown below:

(JCL for job)

```
//CCAIN DD *
```

(User Zero logon and input parms)

```
PROCSYS BATCH PFILE=filename PNAME=procname1 PNAME=procname2
PNAME=procname3 END LOGOUT or you may specify ... PROCSYS BATCH
PFILE=filename PNAME=XYZ* END LOGOUT
```

} This sample would open the } specified file and cross- } reference each of the }  
 procedures in the list of } PNAME input parms. } This sample would open the }  
 specified file and cross- } reference all of the } procedures that start with } the  
 characters XYZ.

The parameters that can be specified in the input stream for BATCH204 and BATCH2 include:

PROCSYS BATCH

Issues the subsystem command name PROCSYS with the command line variable BATCH to indicate that this is a batch process and additional parameters follow.

PFILE=xxxx,dummy,pass

Primary procedure file name. Dummy string used in code to represent the procedure file name. Password for file access, if any. Commas are required delimiters if dummy or password is entered. Long name for this parm is PRIMARY-FILE.

SFILE=xxxx,dummy,pass

A maximum of five subroutines or supporting file parameter inputs can be specified for one execution PROCSYS BATCH. The same rules that applied to PFILE apply to SFILE. The long name for this parm is SECONDARY-FILE.

PNAME=yyyyy

There is no limit to the number of procedure name parameter inputs for a single execution of PROCSYS BATCH. Wild card input strings such as XYZ\*, \*XYZ or \*XYZ\* are allowed. The long name for this parm is PROC-NAME.

LL=nnn

Output line length (OUTCCC) parm. Default is 133. The long name for this parm is LIST-LL.

LPP=nnn

Output lines per page (OUTLPP) parm. Default is 66. The long name for this parm is LIST-LPP.

DUPD=Y

Dictionary update parm will cause METADATA and DATALINK to be updated by the cross-reference process. The long name for this parm is DICT-UPDATE.

LUSE=xxxxxxx

Listing destination parm. You can specify OUTxxxx, \$PRINT CLASS or PRINT QUEUE. Default \$TERMINAL. The long name for this parm is LIST-USE.

PRINT=Y

Default is N. This option suppresses the generation of the cross-reference listing and report.

END

Signals that the end of the parameter list has been reached.

You may run more than PROCSYS BATCH in a given job. This will allow you to run multiple primary files in a single job. To accomplish this, specify the input parms as shown:

```
PROCSYS BATCH PFILE=FILE1 PNAME=XXX* END * PROCSYS BATCH
PFILE=FILE2 PNAME=YYY* END * PROCSYS BATCH PFILE=FILE3 PNAME=ZZZ*
END
```

There is a distinct performance advantage in running more than one PROCYS BATCH in a job, since the compilation of the cross-reference only happens once.



---

**CHAPTER 13** *Appendix B - SIRXREFD Fields*

Following is a description of the fields and the file structure of the SIRXREFD database. A couple sample procedures are appended.

Fieldname	Attributes/Description
-----------	------------------------

**ALIAS**

Allows an alias name to be assigned to an entity. Usually this field is not used.

**ATTR**

Attributes from a variable declaration statement, such as "STRING LEN 80". This field only exists on REC.ID=PER records.

**CDATE**

Date the cross-reference data was created. This date is stored on each REC.ID=CNTRL record.

**CFILE**

(ORD CHAR) Name of the file/group with which the entity is associated. This field establishes file/group context for entities like LABEL, RECORD, LIST and FIELD.

**CLABEL**

(ORD CHAR) Name of the label with which an entity is associated. This field holds both labels and statement numbers.

**CLIST**

(ORD CHAR) Name of the list with which an entity is associated.

**CTIME**

(NUM RANGE) Time the cross-reference data was created. This field is stored on each REC.ID=CNTRL record.

**DCL.LINE**

Declaration line. Relative line number in the fully expanded User Language procedure at which an entity was declared. Declarable entities are %variables, images, screens,

lists, etc. DCL.LINE is only held in the SIRXREFD database if the user is also keeping REF.LINES (these may be kept or discarded via a switch in the xref load job. A great deal more space is required if storing reference and declarations lines, so it is recommended that these fields not be kept.).

FD.ST.MK

FIND/STORE Mark. If the field is used in a FIND or STORE statement in the procedure a “\*” is stored in this field.

FIELD.USE.FG

Field Use Flag. This field is used on REC.ID=FIELD and REC.ID=GVAR records, to indicate the usages to which the field or global variable are put. For REC.ID=GVAR, valid values are S (for \$SETG), and R (for retrieval via \$GETG or dummy substitution). The concatenated value SR is used to indicate both setting and retrieval of a global are done in the indicated procedure.

For REC.ID=FIELD, valid values and the usage they indicate are:

F

FIND statement.

W

FIND (in a “WHERE WITH” clause).

S

STORE

A

ADD

C

CHANGE

D

DELETE

I

INSERT

R

READ (as in assignment or print statements).

blank

READ (as in assignment or print statements).

GVAR.VAL

Value to which a global variable is initially set (indicated on some REC.ID=GVAR records).

LEVEL

Indicates the “indentation level” at which the entity was encountered. For example, if a field is shown with a LEVEL of 1.3, it was found in code in the third INCLUDED procedure, included from the mainline code.

NAME

(ORD CHAR) Name of the entity. E.g., to find all reference information on a field called “ORDER.NO” in a file called ACCOUNTS you would request:

```
XX: IN SIRXREFD FD REC.ID = 'FIELD' FILE = 'ACCOUNTS' NAME = 'ORDER.NO'
```

PARAM

On REC.ID=COMMAND records this field holds the parameter name which is altered via a RESET or UTABLE command.

PARAM.CT

Number of parameters altered via a RESET or UTABLE command (on REC.ID=COMMAND records).

PROC.ID

(ORD CHAR) Name of the cross-referenced procedure. Format is FILE:PROCEDURE, where FILE is the source procedure file and PROCEDURE is the full procedure name.

PROC.LEVEL

Indicates the INCLUDE level at which the cross-reference job found this entity. This number is equal to the number of “levels” shown in the LEVEL field (e.g. if LEVEL=1.2.3.1, PROC.LEVEL would equal 4).

REC.ID

(ORD CHAR) REC.ID identifies the entity type. Record type may be one of the following:

CNTL

Control record for each cross referenced procedure. This is the only REC.ID value that is not an entity type. CNTL records are stored once for each procedure for each LEVEL at which it is encountered.

FIELD

Field name.

GVAR

Global variable name.

GVAL

Value assigned to a global variable.

KAN

\$function

PER

Percent variable name.

SVAL

Any hard-coded string value (as in assignment statements or finds).

SCREEN

Screen name.

SUB

Subroutine.

LABEL

Label or statement number.

FILE

Filename (may be up to 10 characters to accomodate “?&” global substitution).

**LIST**

List name.

**COMMAND**

Command.

**RECORD****IMAGE**

Image name.

**INC**

Included procedure name.

**PNAME**

Procedure name (for COMMAND records like "OPEN").

**REF.LINE**

Relative line number in the fully expanded procedure in which the entity occurs. Line numbers are shown on the cross-reference report if it is printed. Storing these reference numbers is optional, and requires a considerable amount of storage. It is recommended that REF.LINES not be stored.

**SUBROUTINE**

(ORD CHAR) Name of the subroutine in which the cross-referencer found the information for this entity. Entities cross-referenced to the mainline procedure will have SUBROUTINE='\*\*\*MAIN\*\*\*' or the SUBROUTINE field will not be present.

**USER.ID**

(ORD CHAR) User ID that ran the cross-reference job. The User ID is placed on each REC.ID=CNTL record.



---

 CHAPTER 14 *USER LANGUAGE AD-HOC EXAMPLES*

Below is a short, sample ad-hoc program to retrieve data from the SIRXREF data file SIRXREFD. A number of other ad-hoc programs are distributed in file SIRXREF.

```

OPENC FILE SIRXREFD
* List unique fieldnames referenced by procs in file
PROCFIELD.
BEGIN
FDX:  IN SIRXREFD FD REC.ID = 'FIELD'
PROC.ID IS LIKE PROCFIELD*
PLX:  PLACE RECORDS IN FDX ON LIST MASTER
FR EACH RECORD ON LIST MASTER
NTX:  NOTE NAME
PLX  PLACE RECORD ON LIST UNIQUE
FDY:  FD ON LIST MASTER FOR WHICH NAME = VALUE IN NTX
RMX:  REMOVE RECORDS IN FDY FROM LIST MASTER
END FOR
STX:  SORT RECORDS ON LIST UNIQUE BY NAME
FR STX
PRINT NAME
END FOR
END
* Procs are loaded in alphabetical order if a whole file is
* xref'd at once.
That helps avoid sorts when writing adhoc.
OPENC FILE
SIRXREFD
BEGIN
%S IS STRING LEN 90
%F IS STRING LEN 60
FX:  IN SIRXREFD FD  PROC.ID IS LIKE PROCFIELD*
REC.ID = FIELD
CFIELD = 'DATAFILE'
CX:  COUNT RECORDS IN FX
PX:  PRINT 'XREF RECS: ' WITH COUNT IN CX
RX:  FR FX
NX:  NOTE PROC.ID
IF %F NE VALUE IN NX THEN
%F = VALUE IN NX
%S = $PARSEX(PROC.ID,':')
PRINT %S AT 1 NAME AT 12
ELSE
PRINT          NAME AT 12
END IF
END FOR
END
  
```



---

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