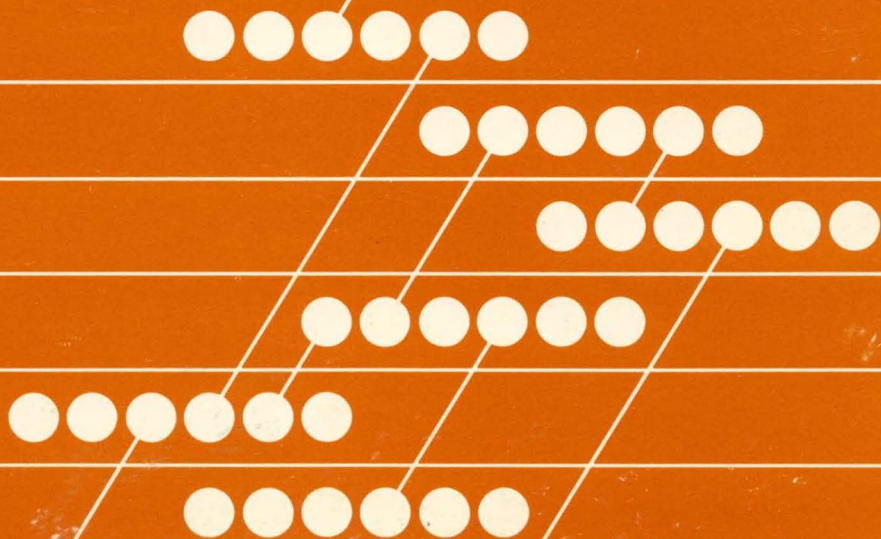


Interactive
System Productivity Facility/
Program Development Facility
Version 2 Release 2

Library Management

MVS

IBM



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System Productivity Facility/
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Library Management

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PREFACE

The Library Management Facility (LMF) is an extension of the Interactive System Productivity Facility (ISPF) library concepts and options. It allows users to control the contents of their libraries and to manage their development processes. Libraries controlled by LMF are called "controlled libraries."

This manual tells you how to create the LMF library controls and how the controlled libraries are used in the development process. It assumes that you are engaged in program development and are familiar with the operation of the ISPF/Program Development Facility in the MVS environment.

Chapter 1 presents an overview of LMF, telling you:

- What it is
- What it will do for you
- How it is structured
- The terminology used.

Chapter 2 describes how a library administrator administers the controlled library. To this end, it specifies how a library administrator:

- Creates the library hierarchy
- Defines the library controls
- Maintains the libraries and the controls.

Chapter 3 guides a user in:

- Obtaining a member from a controlled library
- Promoting a member into a controlled library
- Promoting a member within a controlled library.

LMF is part of the Program Development Facility (PDF) of the Interactive System Productivity Facility (ISPF). To understand and use LMF, you should be familiar with PDF and its operation as described in:

- Interactive System Productivity Facility/Program Development Facility for MVS Program Reference, SC34-4024.

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CHAPTER 1. INTRODUCTION

This chapter presents an overview of the Library Management Facility (LMF), which is a part of ISPF/PDF. At the conclusion of this chapter, you should be able to answer many questions about LMF, including:

What is LMF?

What will LMF do for me?

How is LMF structured?

What terminology will I need to know to use LMF?

Definition of LMF

The Library Management Facility is an optional extension of the ISPF library concepts and options. Before going into a discussion of LMF, let's take a brief look at what is meant by "library" and what an ISPF library is.

A library is a repository for information. Information can be taken from the library and used in some manner. It may also be changed as a result of use or from additional data becoming available. The information can then be returned to the library, either unchanged or modified.

A library must be organized so that information can be readily retrieved and returned to its rightful place. There must also be a mechanism to permit retrieval and replacement of information.

An ISPF library is a collection of code or data units, called members. ISPF can have many libraries containing different types of information. However, any individual library generally contains members with the same type of information. Each library is a cataloged partitioned data set, with a 3-level name in the form:

`'project-name.group-name.type'`

where:

- "project-name" is the common identifier for all libraries in the same project.
- "group-name" identifies a particular set of libraries.
- "type" identifies the type of information in the library, such as Assembler Source Code, COBOL programs, or SCRIPT files.

Note: The second-level qualifier has been changed from "library", as it was in the previous release of ISPF/PDF, to "group", to avoid any confusion that might arise from having a qualifier called "library" as part of an ISPF library name.

A library member is identified as:

'project-name.group-name.type(member)'

Libraries can be organized in a hierarchical manner. For example, members being developed or updated are generally in a development library. Those members that have been unit tested and are ready for integration testing can be moved up the hierarchy to a test library. Those members that have been completely tested can be moved up the hierarchy to a master library.

For a discussion of the library structure, refer to ISPF/PDF for MVS Program Reference.

LMF allows users to control the contents of their libraries and to manage their development processes. Libraries controlled by LMF are called **controlled libraries**.

LMF controls determine who can:

- Enter information into a controlled library
- Get information from a controlled library to modify and return to the controlled library
- Move information from one controlled library to another.

In other words, the controls allow the user to determine who can manipulate library members.

Note: RACF, or an equivalent protection system, is required in order to enforce the controls set by LMF. Without data protection, there is a high risk of damaging the integrity of the data. See ISPF and ISPF/PDF for MVS Installation and Customization for more information.

One problem of importance in a development project is maintaining data integrity. LMF helps maintain integrity by ensuring that only one person can update a member at a time. In addition, LMF allows only those people authorized to update a member to update that member. It does this by allowing only authorized people to replace a member in a controlled library with an updated member. LMF also aids the development process in other ways, such as allowing authorized people to put a member into two or more hierarchies at once.

MVS password protection cannot be used on libraries controlled by LMF, since the LMF-initiated task cannot know what the password is. You will get an error message if you attempt to use a password-protected library that LMF cannot handle.

To use LMF, you will need a library administrator to set up the controls and maintain them.

Library Structure

LMF uses the same library concepts and structure as ISPF/PDF. In fact, LMF libraries are ISPF libraries. However, the libraries managed by LMF are controlled. The controls determine which members can be promoted and edit-locked. Promotion is the mechanism for moving a member to a controlled library, and for moving a member to higher levels within a controlled library. Edit-locking prevents more than one person at a time from updating a member in a controlled library.

The following terminology applies to libraries controlled by LMF:

- | | |
|----------------------------|--|
| Controlled Library | An ISPF library that has been identified as a library to which users must have specific authority for access, for updates, and for promotion activities. |
| Promotion | The means by which a member is moved to a controlled library, or moved to higher levels within a controlled library. |
| Promotion Hierarchy | An ordered set of related controlled libraries that a member is promoted through during the development or maintenance process. |
| Library Hierarchy | A promotion hierarchy in which all the libraries have the same "type" qualifier. |

A collection of controlled libraries having a common project and group name is called a Controlled Group. A collection of controlled groups having a common project name is called a Controlled Project.

Figure 1 illustrates a controlled project, ISPFEXAM. This project has a 3-level hierarchical structure with four controlled groups, PROD, SYSTST, DEPT1, and DEPT2. Each controlled group has three controlled libraries, one each for PLI, MSGS, and LOAD. The libraries in group PROD, for example, are ISPFEXAM.PROD.PLI, ISPFEXAM.PROD.MSGS, and ISPFEXAM.PROD.LOAD.

Promotion to the controlled project involves moving a member into an entry-level library: for example, into ISPFEXAM.DEPT2.PLI. Promotion within the controlled project involves moving a member from one level library to the next higher-level library of the same type. Thus, promotion of a member is within the library hierarchy. Promotion from ISPFEXAM.DEPT2.PLI is, for example, moving the member to the next level

in the hierarchy, to ISPFEXAM.SYSTST.PLI. We will look at promotion again later in this chapter.

We will use the controlled libraries in Figure 1 in Chapters 2 and 3 to illustrate the operations available in LMF.

ISPFEXAM

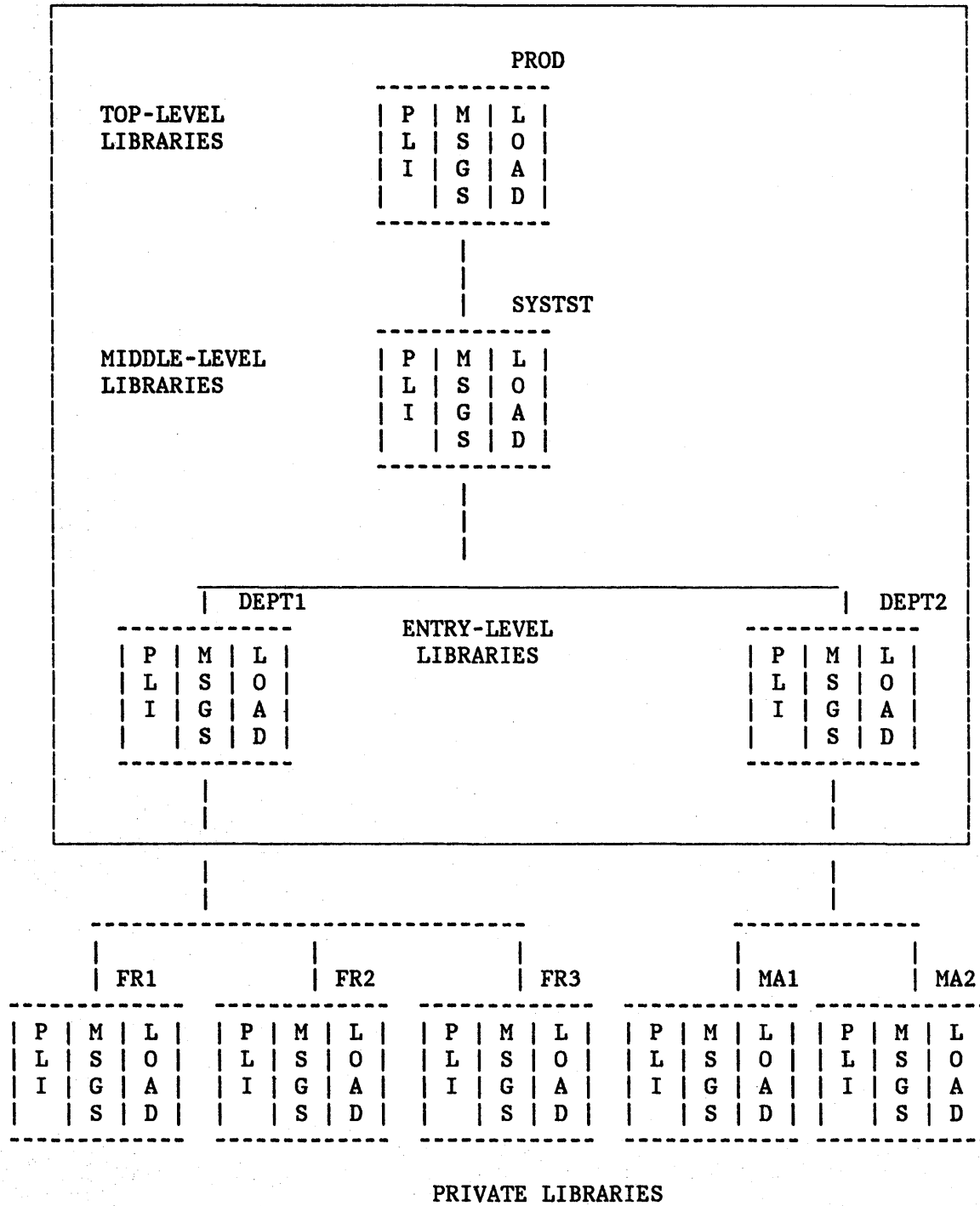


Figure 1. ISPF Controlled Project (ISPFEXAM)

Controls

The controls that are available with LMF organize your libraries into a hierarchical structure. They also direct, guide, and restrain the movement of members into and out of controlled libraries. Controls are set up by the library administrator. More details on setting up controls are given in Chapter 2 of this manual.

The kinds of control available include:

- Authority to access a member for update (edit-lock) and, later, replace it by a promotion
- Authority to promote a member from one controlled library to another
- Authority to place an undefined member in a controlled library. (An undefined member is a member that does not currently exist in a controlled library and is not predefined.)
- Ability to pack a member upon placing it in a controlled library
- Ability to log the accessing and promoting of members
- Authority to modify controls.

Library Development

The library hierarchy is developed by the library administrator. The library administrator has to determine the relation of the libraries to be controlled and the number of levels in the hierarchy. At least one group must be defined for each level.

The group at the highest level of a hierarchy is called the Top Group (PROD in Figure 1). The group at the lowest level of a hierarchy is called the Bottom Group (DEPT1 and DEPT2 in Figure 1). You can have more than one group in each level of the hierarchy below the top group.

A member can enter a controlled project only through a library in a bottom group. Thus, each controlled library in the bottom group of libraries is an Entry-Level Library, a library into which a member is promoted when entering the controlled project.

All groups except the top group have a Target Group. A target group is a controlled group containing the library into which a member can be promoted. Specifying target groups is the means by which a library administrator defines the promotion hierarchy.

Referring again to Figure 1, we can categorize the different groups as follows:

Top group	PROD
Bottom groups	DEPT1 and DEPT2
Target group for PROD	none
Target group for SYSTST	PROD
Target group for DEPT1	SYSTST
Target group for DEPT2	SYSTST
Group for which DEPT1 or DEPT2 is target	none

This points out that the top group is the only group that does not have a target group. Also, the bottom groups are the only groups that are not target groups.

When defining the controls within the promotion hierarchy, the library administrator can identify those people who are authorized to:

- Access a member with intent to update and promote it
- Promote members to the entry-level library
- Promote a member from one controlled library to another controlled library
- Authorize additional library administrators.

The naming of the people authorized to perform the various LMF functions is accomplished by entering their logon IDs into a named user set. A User Set is a collection of authorized user logon IDs. A user set is required whenever more than one person is to be authorized to perform particular functions. If only one person is authorized, that person's logon ID is specified.

A user set is dynamic. Logon IDs can be added or deleted from the user set during the course of the project. However, only the library administrator can create the user set and add or delete entries in the user set.

The library administrator can also create distribution tables. Distribution tables allow members common to several different library hierarchies of a project to be promoted into those hierarchies at the same time by a single promotion. A Distribution Table is a table containing the groups that identify the different library hierarchies into which a specified member is to be promoted. Members are distributed according to version numbers. A Version Number is used to associate a member with a particular promotion hierarchy. Version

numbers are assigned by the library administrator and set by the program developer.

Library Use

To work with a controlled library, the user must have authorization to access a member for update. The user cannot edit, move, or copy a member into a controlled library. This is enforced through RACF or an equivalent protection system. Using a concatenated edit, the user must actually copy a member from a controlled library in order to work on it. Thus, members are updated in the user's private library. The updated member then goes through the promotion process to be returned to the controlled library.

When a member is promoted to a controlled library, the user is asked for the "target" library. The user must specify the entry-level library. The "target" library for promotion of a member into a controlled library is an entry-level library.

When a member is promoted from one controlled library to another controlled library, the user need not specify a target library. The library administrator defined all target libraries when the controlled project was developed.

Tutorials

Tutorials are provided to help you in working with LMF. The tutorials aid both the library administrator and the user of controlled libraries.

Should you need assistance in your work, enter the command HELP on any panel. You will be provided with a tutorial for that panel. For example, you can use the tutorials to obtain definitions, information about messages, and general concepts as well as help on particular panels.

Note: The panels shown in this manual are only representative of the panels in the product. While the contents are the same, the panels shown here may differ slightly in placement of fields and other elements.

CHAPTER 2. LIBRARY ADMINISTRATION

Library administration involves:

- Planning the library structure
- Defining the library controls that create the structure
- Maintaining the library and controls.

The library administrator is responsible for performing these functions.

In this chapter, we will examine the actions taken by the library administrator in planning the library structure, defining the library controls, and maintaining the library. We will use the library structure represented in Figure 1 to illustrate the actions of the library administrator.

The library structure illustrated in Figure 1 represents a project, ISPFEXAM, having two sets of programmers. Each programmer has a set of private libraries (the "FR" and "MA" libraries) for development purposes. Members are moved into the controlled structure by being promoted to the entry-level controlled libraries from these private libraries. Promotion to the middle-level libraries can be for integrating and testing the work of the two groups (DEPT1 and DEPT2). Promotion to the top-level libraries can be for integrating and testing new material with older material, perhaps from a previous release.

All library controls in each hierarchy can be created, together with the hierarchical controls, by using two panels, the Specify Library Controls panel and the Create or Update Library Controls panel. You create the library controls one at a time, starting with the top-level library and proceeding down the hierarchy to the bottom-level, or entry-level, library (or libraries).

After all library controls have been created, you should allocate space for every library in your structure. This allocation is very important. Unless you allocate the space for your libraries, your structure will be unusable.

Use the Data Set Utility, PDF option 3.2, to allocate space for data sets.

To create the library hierarchy and define the library controls, it is necessary to plan the structure of the libraries. In other systems you may be accustomed to, there is one large library with status indicators identifying modules under development, in test, and so on. With LMF, members with the same status should be together in a single library

group. For example, stable programs may be in a top-level group of libraries and programs being tested may be in a different group of libraries in the hierarchy.

Planning the library structure involves identifying the libraries to be managed and their relationship to each other in a promotion hierarchy.

If there are many members with the same project name and type, you may improve system performance by breaking the one large project into two or three small projects.

To create the library hierarchy and controls, take the following steps:

1. Working down from the top group in the promotion hierarchy, identify each library in turn with its associated controls (option 8.1).
2. Allocate and protect the data sets for each library. The data sets must be allocated as partitioned data sets (option 3.2). Do not password-protect these data sets.

Note: When protecting the library, make sure that you give yourself RACF read-only authority. In addition, the user ID associated with the started task must have RACF update authority. For more information, see ISPF and ISPF/PDF for MVS Installation and Customization.

3. Specify those users who are authorized to perform library functions (option 8.2).
4. Activate the promotion hierarchy controls (option 8.4).

Each of the four steps is discussed in this chapter.

LMF will give you the results of your requested actions whether they are successful or unsuccessful. The message always appears on the right side of the top line of the panel.

INVOKING LMF UTILITIES

Option 8 of the ISPF/PDF primary option menu, Figure 2, will take you into the library management utilities.

```
----- ISPF/PDF PRIMARY OPTION MENU -----
OPTION ==> 8_

0 ISPF PARMs - Specify terminal and user parameters      USERID - Z59FLG
1 BROWSE     - Display source data or output listings    TIME    - 09:32
2 EDIT       - Create or change source data              TERMINAL - 3278T
3 UTILITIES  - Perform utility functions                 PF KEYS - 12
4 FOREGROUND - Invoke language processors in foreground
5 BATCH      - Submit job for language processing
6 COMMAND    - Enter TSO command or CLIST
7 DIALOG TEST - Perform dialog testing
8 LM UTILITIES - Perform library management utility functions
C CHANGES   - Display summary of changes for this release
T TUTORIAL   - Display information about ISPF/PDF
X EXIT       - Terminate ISPF using log and list defaults
```

Figure 2. ISPF/PDF Primary Option Menu

The first panel you will see is the Library Management Utilities panel, shown in Figure 3.

```
----- LIBRARY MANAGEMENT UTILITIES -----
OPTION ==> _

1 CONTROLS - Specify library attributes:
             Create, update, or delete promotion hierarchies,
             Authorize access to controls or members in hierarchies,
             Specify action taken when promoting members.
2 USER SET - Create, update, or delete list of users authorized
             to perform library functions.
3 DISTRIBUTION - Create, update, or delete a distribution table to
               relate different promotion hierarchies.
4 ACTIVATE - Activate or deactivate promotion hierarchy controls.
5 REVIEW - Browse or print activity and library controls
           information.
T TUTORIAL - General information about the library management
            utility facility.
```

Figure 3. Library Management Utilities Panel

The options on the Library Management Utilities Panel are as follows:

1. Controls - This option allows you to create your library hierarchies and to put the controls for the promotion hierarchies in place. This option is also used when you update or delete your promotion hierarchies, or create, update, or delete controls for members.
2. User Set - This option allows you to specify those people who are authorized to perform the various library functions. You may define more than one user set.
3. Distribution - This option allows you to set up tables that permit the promotion of a member to different library hierarchies with just one promotion. Each library hierarchy can have only one distribution table.

- 4. Activate - This option allows you to activate or deactivate the controls you created. If you want to promote members into the hierarchy, or edit members from the hierarchy, you must activate the controls. If you want to update or delete any of the controls, you must first deactivate the controls.
- 5. Review - This option allows you to see how the library and member controls are set up, who accessed members for update, and who has promoted members.
- 6. Tutorial - This option allows you to obtain an overview of LMF.

We will look at options 1 through 5 in greater detail in the following sections. Option T is discussed in "Tutorials" on page 8.

CONTROLS (OPTION 1)

Selecting option 1, Controls, causes the Specify Library Controls panel to be displayed. A representation of this panel, with the information pertinent to the example described in Figure 1, is shown in Figure 4.

```
----- SPECIFY LIBRARY CONTROLS -----
OPTION ==> 1

1 - Create or update controls for library hierarchies.
2 - Delete library controls.
3 - Create, update, or delete controls for members in a top library.

ISPF LIBRARY:
PROJECT ==> ISPFEXAM
GROUP   ==> SYSTST
TYPE    ==> PLI_
For option 3:
MEMBER  ==>                (Name, truncated name, or * allowed)
```

Figure 4. Specify Library Controls Panel

This panel allows you to specify what you want to do with the controls. It requires that you identify the library controls you want to use. The option you select applies only for the library you identify. To create controls, always start with the top-level library, and then build your library hierarchy by going down one level at a time, until you create the controls for the entry-level library. You can create the controls for one library hierarchy at a time, or you can create all controls for all the libraries in a group before going to the next-lower group.

The three options allow you to specify what you want done to the identified library:

- Option 1 - You want to create or update controls for the specified library.

- Option 2 - You want to delete the controls for the specified library.
 - Option 3 - You want to control who can access specific members in a library hierarchy.
 - If the members exist in the library, you can change the IDs of those who can access the members.
 - If the members do not exist in the library, you can predefine them. That is, you can control who can promote the specific member to a controlled library for the first time. Predefining members can be done only for a top-level group library.
- The member field should contain a name, a truncated name, or an asterisk.

Create Library Controls

Selecting option 1 of the Specify Library Controls panel allows you to create the controls for the library specified. Remember that you have to create the controls in a top-down fashion; that is, the top-level library first, then successive lower-level libraries, until you create the controls for the entry-level library.

Selecting option 1 results in the Create Or Update Library Controls panel. The panel for the middle-level PLI library in our example is shown in Figure 5.

```
----- CREATE OR UPDATE LIBRARY CONTROLS -----
COMMAND ==>
```

Enter the END command to save changes, or CANCEL to exit without saving.

Global controls:

TARGET GROUP FOR PROMOTE	==>	PROD	(Blank if SYSTST is top group)
ADMINISTRATOR FOR ISPFEXAM	==>	LIBADM	
LOG ACTIVITY	==>	YES	(YES or NO)

Controls for library ISPFEXAM.SYSTST.PLI:

AUTHORIZED PROMOTERS	==>	USSET	(Blank if library is top)
DISTRIBUTION TABLE NAME	==>		(Optional)
COLLECTION NAME	==>		(Optional)

Controls for promotion into entry-level libraries: (Required only if entry-level)

PACK DATA ON PROMOTION	==>	NO	(YES or NO)
USER EXIT ON PROMOTION	==>		(Optional)
USER EXIT TYPE	==>		(COMMAND or PROGRAM)
UNDEFINED MEMBERS ALLOWED	==>	YES	(YES or NO)

If Yes, enter the following controls for undefined members:

MEMBER ACCESS CONTROL	==>	PRIVATE	(LIMITED, OPEN, or PRIVATE)
AUTHORIZED ENTRY ID	==>		(Blank for anyone)

Figure 5. Create or Update Library Controls Panel

This is a panel that allows you to define global controls, general library controls, entry-level library controls, and undefined member controls. We will start by seeing what the Global controls are and the information required for them.

Global Controls

The following controls are global; that is, they apply to more than the library specified on the Specify Library Controls panel on page 14.

Target Group for Promote - When a member is promoted within a controlled library, it is necessary to specify the group to which it is being promoted, the "target" group. The target group is always the next higher-level group. You leave this entry blank for a top-level group. The target group must have a library with controls defined.

As PROD is the top-level group in the example shown in Figure 1, members cannot be promoted out of PROD. Hence, there is no target group, so this entry is left blank.

When the controls for a library in group SYSTST are created, the entry is

```
TARGET GROUP FOR PROMOTE ==> PROD (Blank if SYSTST
                                   is top group)
```

Similarly, the target group for libraries in both controlled groups DEPT1 and DEPT2 is SYSTST.

The target group applies to all libraries with the defined project and group.

Administrator for project - Enter the logon ID of the library administrator. A project may have more than one library administrator. If so, the name of a list is entered. That list, called a user set, contains the logon IDs of all library administrators who can update controls. User sets are created with the user set option (option 8.2). The user set must exist before it can be used as a library administrator. If library administrator is a user set and your logon ID is on the list, you cannot remove yourself from that list. Some other person on the list can remove your ID, if necessary.

For our example, we have a single library administrator with the logon LIBADM. The administrator is global with respect to the controlled project.

Log Activity - If you want all library activity logged, enter YES; otherwise, enter NO. Log activity applies only to the library hierarchy; that is, those libraries with the given project and type that have the same top group.

Note: If you specify that the activities are to be logged, you must allocate space for a log data set for each type whose activity is to be tracked. To allocate the data set, use the Data Set Utility, PDF option 3.2. Use the name

```
project.type.ACTLOG
```

for the data set. To allocate space for the activity log for type PLI of our example, you specify the name ISPFEXAM.PLI.ACTLOG. The data set allocated must be sequential and have a record length of 90. The block size, if blocking is desired, can be defined to be whatever is most efficient for your installation.

Log activity is global since it records the activity for each library in the library hierarchy.

General Library Controls

The items discussed in this section apply to the library specified on the Specify Library Controls panel on page 14. For our example, note that we displayed:

Controls for library ISPFEXAM.SYSTST.PLI

on the Create or Update Library Controls panel on page 16.

The general library controls on the panel are:

Authorized Promoters - This item specifies the person, or persons, authorized to promote a member from the specified library to the library in the target group. It is either the logon ID of the person or the name of a user set that contains the logon IDs of the people so authorized.

If the library is contained in a top group, you must leave this item blank. If the library is not contained in a top group, Authorized Promoters must be entered, and the target group must be specified.

Distribution Table Name - If you want to promote a member into more than one hierarchy, specify the hierarchies in a distribution table. The name of the table for this hierarchy is specified here. Distribution tables are discussed in "Distribution" on page 30.

Collection Name - If you want to label a particular set of promotions in the activity log, enter a name. The collection name is a user field included in the activity log for each promotion. It could be used to group promotions by driver or release.

Entry-Level Library Controls

The following items refer to promoting a member to a controlled library. A member can be promoted to a controlled hierarchy only by promoting it into an entry-level library. Therefore, these controls are for an entry-level library, as illustrated by the Create or Update Library Controls panel in Figure 6.

----- CREATE OR UPDATE LIBRARY CONTROLS -----
COMMAND ==>

Enter the **END** command to save changes, or **CANCEL** to exit without saving.

Global controls:

TARGET GROUP FOR PROMOTE ==> SYSTST (Blank if DEPT1 is top group)
ADMINISTRATOR FOR ISPFEXAM ==> LIBADM
LOG ACTIVITY ==> YES (YES or NO)

Controls for library ISPFEXAM.DEPT1.LOAD

AUTHORIZED PROMOTERS ==> USSET (Blank if library is top)
DISTRIBUTION TABLE NAME ==> (Optional)
COLLECTION NAME ==> (Optional)

Controls for promotion into entry level libraries: (Req. only if entry level)

PACK DATA ON PROMOTION ==> NO (YES or NO)
USER EXIT ON PROMOTION ==> PROMCHEK (Optional)
USER EXIT TYPE ==> COMMAND (COMMAND or PROGRAM)
UNDEFINED MEMBERS ALLOWED ==> YES (YES or NO)
If **YES**, enter the following controls for undefined members:
MEMBER ACCESS CONTROL ==> PRIVATE (LIMITED, OPEN, OR PRIVATE)
AUTHORIZED ENTRY ID ==> (Blank for anyone)

Figure 6. Create or Update Library Controls Panel

Pack Data - This refers to members being promoted to the library. If you want the data packed to save space when it is promoted into the entry-level library, specify YES here. NO is specified when the panel is presented.

The program developer can override the Pack Data field specification when the member is promoted. After the member is promoted, the data will remain packed or unpacked throughout the hierarchy.

PACK uses a unique ISPF data compression routine. Attempts to access or execute the data outside of PDF can cause unpredictable results. See the description of the Edit PACK command in ISPF/PDF for MVS Program Reference for more information.

User Exit Name - If you decide to do additional operations, such as validation, compression, compilation as examples, on a member being promoted into the library, this name specifies the exit for the desired function. See Appendix A for more information. The user exit name for the example in Appendix A is PROMCHEK.

User Exit Type - Indicates whether the user exit is a command or a program. For the example in Appendix A, the user exit type is COMMAND.

Undefined Members - An undefined member is a member that does not exist in a controlled library or does not have member controls predefined. Enter YES or NO. YES means that an undefined member can be promoted to a controlled library. If you enter YES, and if the members are not predefined, then member controls are created for them according to the information in the next two fields. NO means that members that have no controls associated with them cannot be promoted to the hierarchy. For this situation, "new" members can be promoted into the hierarchy only if they are predefined. The next two fields are ignored if the entry is NO.

Access Control - Specifies the ownership (Access ID) of the member when controls are created for it. Access to an undefined member may be:

- Open** Anyone can access and update the member.
- Limited** The access of the member for update depends on the Authorized Entry ID. If the Authorized Entry ID is:
 - blank** anyone can access the member for update (the same as having the access control of open).
 - logon ID** only that person can access the member for update (the same as having the access control as private).
 - user set name** anyone in the user set can access the member for update.
- Private** Only the person who promoted the member can access and update the member.

Authorized Entry ID - This item specifies the person(s) authorized to promote an undefined member to the controlled library. It is either the logon ID of the person or the name of a user set that contains the logon IDs of the people so authorized. If this field is left blank, anyone can promote undefined members.

After all necessary fields are correctly specified on the Create or Update Library Controls panel, enter the END command. The result will be a display of the Specify Library Controls panel as shown on page 14 with the top line stating that the controls have been created. That top line looks like:

----- SPECIFY LIBRARY CONTROLS ----- CONTROLS CREATED

To update library controls, you again select option 1 in the Specify Library Controls panel, shown on page 14. However, you will not be given the entire Create or Update Library Controls panel if lower-level libraries have been specified. If you specify an entry-level library, you get the entire panel. To update all but the lowest-level libraries, a panel, Figure 7, is displayed.

```
----- CREATE OR UPDATE LIBRARY CONTROLS -----  
COMMAND ==>  
  
Enter the END command to save changes, or CANCEL to exit without saving.  
  
Global controls:  
  TARGET GROUP FOR PROMOTE ==>                (Blank if PROD is top group)  
  ADMINISTRATOR FOR ISPFEXAM ==> LIBADM  
  LOG ACTIVITY ==> YES                        (YES or NO)  
  
Controls for library ISPFEXAM.PROD.PLI  
  AUTHORIZED PROMOTERS ==>                    (Blank if library is top)  
  DISTRIBUTION TABLE NAME ==>                (Optional)  
  COLLECTION NAME ==> RELEASE1                (Optional)
```

Figure 7. Create or Update Library Controls Panel

The panel above has a Collection Name of RELEASE1 specified. The use of the Collection Name is illustrated in the activity log on page 41.

Delete Library Controls

The only way to delete the library controls that have been saved is by selecting option 2 of the Specify Library Controls panel. The primary command CANCEL will not delete library controls that have been saved.

When you select option 2, the CONFIRM DELETE panel (Figure 8) is displayed.

```
----- CONFIRM DELETE -----  
COMMAND ==> _  
  
CONTROLS FOR LIBRARY:  ISPFEXAM.PROD.PLI  
  
INSTRUCTIONS:  
  
    Press ENTER key to confirm delete request.  
    Enter END command to cancel delete request.
```

Figure 8. Confirm Delete Panel

After pressing the ENTER key to confirm the delete request, a message on the Specify Library Controls panel will indicate whether the deletion was successful or unsuccessful.

There are three things you must be careful about when you delete library controls. First, the library controls must be deactivated; second, the library must be empty (that is, contain no member controls); and third, after deletion the library structure must retain validity. Only those members in the library whose controls are being deleted should be removed. You should delete library controls before deleting the physical data sets.

Note: Once the hierarchy is deactivated, you can normally delete all but one of the libraries in a group of the promotion hierarchy. That one remaining library can also be deleted provided it is not the target library for any other library in the controlled project.

The procedure for deleting library controls is:

1. Deactivate the hierarchy (top group) that contains the controls. The section "Activate" on page 37 explains how controls are deactivated.
2. If you are deleting a top group, you must remove all predefined members and members that are available for update. The section on "Member Controls" explains how these entries can be deleted.
3. Remove a promoted member that is to be retained by promoting it to the next level in the library hierarchy. The section "Promotion Within the Controlled Library" on page 64 explains how to promote a member to the next level of a library hierarchy.
4. Remove a promoted member that is not to be retained by giving it a zero length. This is accomplished by:
 - a. Accessing the member for update (see "Accessing a Library Member" on page 54).
 - b. Deleting all records from the member.
 - c. Promoting the zero length member to the top-group (see "Promotion to the Controlled Library" on page 61 and "Promotion Within the Controlled Library" on page 64).
5. Retain the validity of the hierarchy by changing the target group for lower-level libraries to the next higher-level group. For example, suppose that library ISPFEXAM.SYSTST.PLI is being deleted. The target group for the libraries ISPFEXAM.DEPT1.PLI and ISPFEXAM.DEPT2.PLI must be changed from SYSTST to PROD. Target groups are changed using the Create Or Update Library Controls panel (see page 21).
6. Delete the library controls.

If you are deleting the controls for more than one library in the library hierarchy, start with the lowest-level library and work up to the highest-level library whose controls are to be deleted.

After you have deleted the library controls, make sure you activate the remaining library controls, if any.

Member Controls

Option 3 of the Specify Library Controls panel is used to control who can access members in a library hierarchy. If the member exists in the library, IDs of those who can access it can be changed if the member is not edit-locked or does not exist at a lower level. If the member does not exist, it can be predefined. The Specify Library Controls panel that would appear for our example is shown in Figure 9.

```

----- SPECIFY LIBRARY CONTROLS -----
OPTION ==> 3

1 - Create or update controls for library hierarchies.
2 - Delete library controls.
3 - Create, update, or delete controls for members in a top library.

ISPF LIBRARY:
PROJECT ==> ISPFEXAM
GROUP   ==> PROD
TYPE    ==> MSGS
For option 3:
MEMBER  ==> *      (Name, truncated name, or * allowed)

```

Figure 9. Specify Library Controls Panel

Notice that the top-group library is specified. Specifying member controls for the top-group library specifies them for the whole library hierarchy. If a member exists in a controlled library, or if controls have been created for the member, then you can change which users are allowed to access the member if the member exists only at the top level. The access ID cannot be changed for members that are edit-locked or exist at lower levels. You can also predefine controls for members. Predefining controls for members allows you to specify who can access a particular member, before that member is promoted to the controlled library.

For this option, the MEMBER must be specified as a member name, a truncated name, or an asterisk. The MEMBER designation determines which member controls are displayed and, hence, updated or deleted.

Member name Only the controls for the member with that name are displayed.

Truncated name A truncated name ends with * to differentiate it from a member name. The controls for all members whose names start with the truncated name will be displayed.

* All member controls will be displayed.

To demonstrate the difference in designating the member name as a truncated name or *, assume that the library ISPFEXAM.PROD.MSGS has members CMSG1, EMSG1, EMSG2, SMSG1, SMSG2... Designating the member name as

MEMBER ==> *

will display the controls for each member of the library. However, using a truncated name, such as

MEMBER ==> EM*

will cause the display of controls for all members whose names begin with EM; namely, the controls for EMSG1 and EMSG2.

Selecting option 3 of the Specify Library Controls panel will produce the Specify Member Level Controls panel, as shown in Figure 10.

----- SPECIFY MEMBER LEVEL CONTROLS ----- ROW 1 OF 13
COMMAND ==> SCROLL ==> PAGE

Add, delete, or change member names or access ids for
library: ISPFEXAM.PROD.MSGS
Enter the END command to save changes, or CANCEL to exit without saving.

	MEMBER NAME	ACCESS ID	DELETE STATUS	(P=Predefined, T=Top Group, blank=Not deletable and cannot alter access id)
	CMSG1____	FR1____		
	EMSG1____	FR2____	T	
	EMSG2____	MA1____	P	
	SMSG1____	FR3____	P	
	SMSG2____	MA2____	P	

Figure 10. Specify Member Level Controls Panel

This panel shows individual member controls of the library with the corresponding access IDs. The access IDs are either logon IDs or user

set names of those people who have the authority to access the corresponding members. The access ID for a predefined member determines who can promote it to the hierarchy.

The column labeled Delete Status specifies whether the member controls can be deleted. Delete Status is not an input field. The controls for any member with a blank Delete Status (CMSG1 in our example) cannot be deleted and the access ID cannot be altered in its present state. There are two ways to delete the controls. First, the member can be promoted to a top group and then deleted; second, the member can be edited into your private library, made into a zero-length member, then promoted through the hierarchy to the top level. The way to make a member a zero-length member is to delete all the lines of the member. The access ID cannot be changed for a member with a blank Delete Status. Access ID is an input field, but an error message will result if you try to save a changed access ID. Once the member is promoted to the top group, you cannot alter the access ID.

If a member has a P in the Delete Status column (EMSG2, SMSG1, and SMSG2 in our example), it is a predefined member. If there is a T in the Delete Status column (EMSG1 in our example), the member is in a top group. Any member with a P or T Delete Status can be deleted by the delete line command. However, if the status is T, the physical member is not deleted.

The apostrophes on the left define the line command area where you can enter commands such as insert (I), delete (D), and repeat (R). Only the controls for predefined members and members available for update in the top group can be deleted. The line commands are useful when you update this list.

The primary commands available are CANCEL, LOCATE, and END. LOCATE can be used to locate either a member name or an access ID.

As soon as a member is promoted into an entry-level library, controls are created for that member. Thus, controls for an undefined member are created in accordance with the Create Controls panel (page 19) and controls for a predefined member are created in accordance with the Member Control panel (page 25). The controls for a member are created after a promotion to a controlled library has begun.

USER SET (OPTION 2)

A user set is used in four circumstances:

- When there is more than one person assigned the authority to promote members out of a controlled library
- With the promotion hierarchy when more than one promoter is needed
- To identify those people authorized to promote undefined members to the controlled library

- As an access ID for a member when there is more than one person authorized to access that member.

The user set lists the logon IDs for those people who are authorized to promote members, or to have access to particular library members or library controls. The same user set need not apply to all four cases noted above. For our example, only one user set, named USSET, is defined.

Option 2 of the Library Management Utilities panel (see page 12) is used to get to the user set specification. The result of choosing option 2 is the Specify User Sets panel, shown in Figure 11.

```
----- SPECIFY USER SETS -----  
OPTION ==> 1  
  
1 - Create or update user set  
2 - Delete user set  
  
PROJECT      ==> ISPFEXAM  
USER SET NAME ==> USSET
```

Figure 11. Specify User Sets Panel

The Specify User Sets panel is used for each user set you want to specify. The project name and user set name must be specified for either option you select.

Option 1 allows you to create, or update, a user set. For our example, we select option 1 to create the user set named USSET.

Option 2 allows you to delete a user set.

Note: If you want to specify a user set as the library administrator under global controls on the Create and Update Library Controls panel (see page 21), you must define the user set before you use the name in creating library controls. Your logon ID must be in the user set. Failure to define the user set first in this situation will prevent the controls from being created.

When you select option 1, the Create or Update User Sets panel, shown in Figure 12, is displayed.

```
----- CREATE OR UPDATE USER SETS -----
COMMAND ==>                                SCROLL ==> HALF

Add, delete, or change user logon ids for user set: USSET
Enter the END command to save changes, or CANCEL to exit without saving.

      LOGON ID          DESCRIPTION
'''' FR1              FRANK
'''' FR2              JOE
'''' FR3              ALAN
'''' LIBADM
'''' MA1              PETE
'''' MA2              RUPERT
```

Figure 12. Create or Update User Sets Panel

The apostrophes on the left define the line command area where you can enter commands such as insert (I), delete (D), and repeat (R). The line commands are useful when you update this list.

The primary commands available are CANCEL, LOCATE, and END. You can perform a LOCATE only on the logon ID.

The column labeled "Description" allows you to enter information pertaining to the logon IDs, if desired. The data in this column is neither checked nor used by LMF. In our example, the name of the person associated with each logon ID is indicated in the Description column.

User sets can be updated while the controls are active.

You cannot delete your own logon ID from a library administrator user set. If you want your logon ID deleted from such a user set, you must have someone else who is specified as a library administrator do it for you. This ensures that there is always a valid administrator.

Selecting option 2, Delete User Set, will cause a Confirm Delete panel, shown in Figure 13, to be displayed.

```
----- CONFIRM DELETE -----  
COMMAND ==> _  
  
PROJECT: ISPFEXAM  
USER SET NAME: USSET  
  
INSTRUCTIONS:  
  
    Press ENTER key to confirm delete request.  
    Enter END command to cancel delete request.
```

Figure 13. Confirm Delete Panel

If you want to delete a user set that is used as a library administrator, you must first change the administrator control (Create or Update Library Controls, option 8.1.1) to a different valid library administrator. Once the user set is no longer used as a library administrator, it can be deleted.

Note: Although the user set you specify when selecting option 2 is deleted, library controls referencing that user set are **not** deleted. You must, therefore, update all library controls that refer to the deleted user set.

DISTRIBUTION (OPTION 3)

The Distribution option, option 3 on the Library Management Utilities panel, is used to specify a distribution table.

A distribution table allows you to promote a member from a private library into multiple entry-level libraries with a single interaction. It also allows you to promote members from one level of a library hierarchy to another. Let's look at an example.

Assume that you have a project, PROJ, with two separate library hierarchies, as illustrated in Figure 2. For simplicity, only one type and two hierarchies are included in this example.

There are various reasons for having separate library hierarchies in a project, including:

- Parallel efforts with different implementation techniques are in progress, with some members in common.
- One hierarchy is used as a checkpoint set for the other hierarchy.
- One hierarchy is used for updating purposes while the other hierarchy, not accessible for updating, maintains the latest updated state.

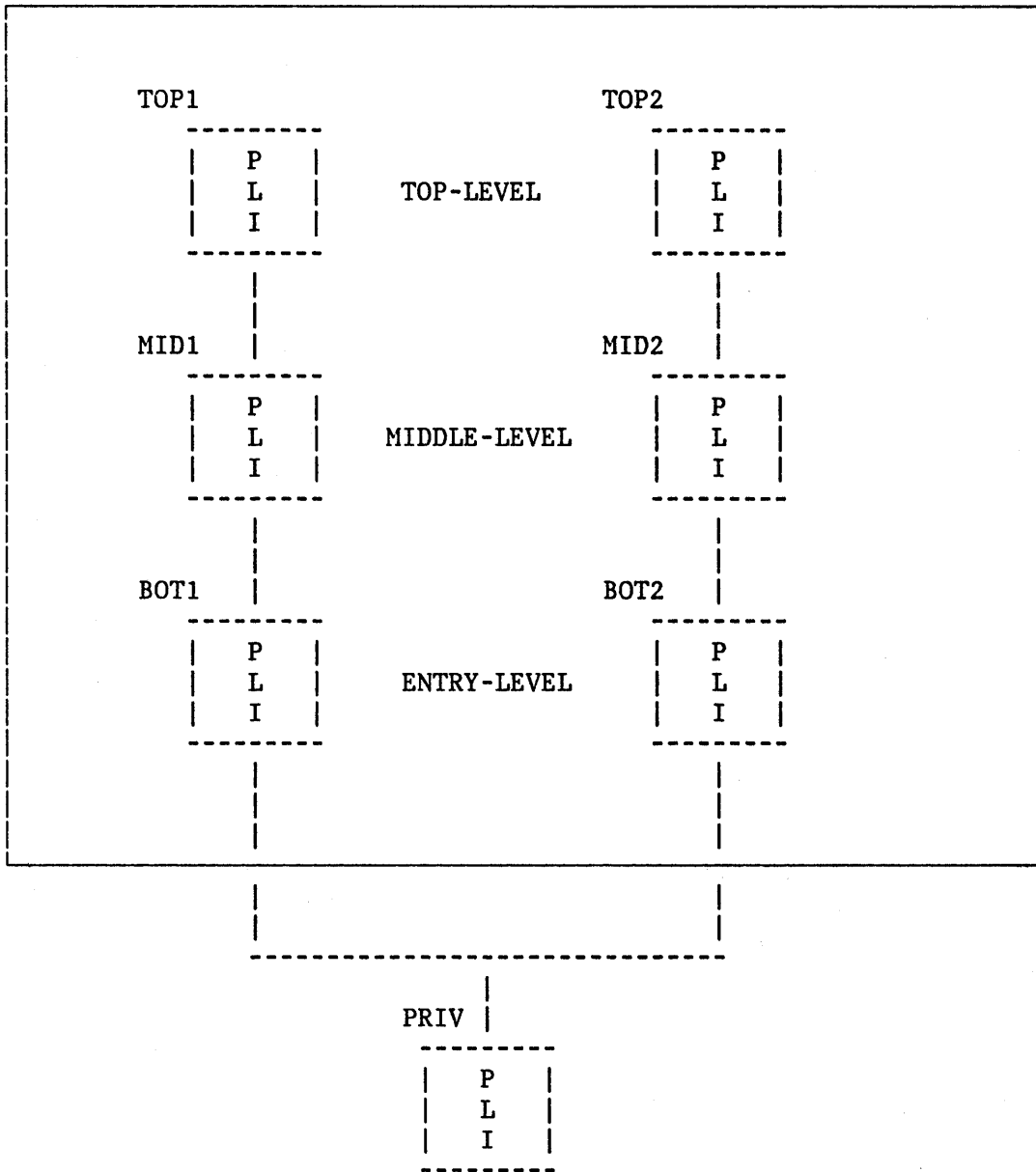


Figure 14. Sample Structure for Distributive Promotion

There are other reasons that your installation may have for having separate library hierarchies within a project.

Now, suppose a member, MEMB, has been created or updated in a private library. MEMB is to be promoted to both entry-level libraries depicted in Figure 14, and only one promotion is to be used. Such a distributive promotion can be accomplished with a distribution table. The distribution table contains version numbers of members to be distributively promoted, together with the target groups for each member identified.

Version numbers are established by the library administrator when the distribution table is created. These version numbers must be given to the developers who assign them to the members they are developing. Version numbers are assigned using the edit VERSION primary command or by using the Reset Utility, PDF option 3.5. For a discussion of version numbers, refer to ISPF/PDF for MVS Program Reference.

The library hierarchies that are associated with a distribution table must be identified as such. This association is accomplished by entering the name of the distribution table in the Create and Update Library Controls panel of each of the target libraries of the hierarchies. For the structure shown in Figure 14, the target libraries are the entry-level libraries. Thus, if the distribution table is named DIST, the entry in each of the Create and Update Library Controls panels for the libraries PROJ.BOT1.PLI and PROJ.BOT2.PLI is

DISTRIBUTION TABLE NAME ==> DIST

Only one library in the library hierarchy may have the name of the distribution table. However, there may be another distribution table in the promotion hierarchy associated with another library type.

Distributive promotion is not confined to promotion into entry-level libraries. You can, if you wish, promote a member from an entry-level library into two middle-level libraries, from an entry-level library into a middle-level library and a top-level library, or from a middle-level library into two top-level libraries. In each case, the name of the distribution table is associated with the target libraries.

Note: When a distribution table is associated with a library hierarchy, all members promoted to, or within, that hierarchy must have a version number listed in the distribution table. If that member is not to be promoted to a library hierarchy other than its own hierarchy, its version number must still appear in the distribution table. Version numbers of members that are promoted in more than one hierarchy appear several times in the distribution table, once for each hierarchy.

To define a distribution table, select option 3 of the Library Management Utilities. The panel shown in Figure 15 is displayed.

```
----- SPECIFY DISTRIBUTION TABLES -----  
OPTION ==> 1  
  
1 - Create or update distribution table  
2 - Delete distribution table  
  
PROJECT ==> PROJ  
DISTRIBUTION TABLE NAME ==> DIST
```

Figure 15. Specify Distribution Tables Panel

There are two options. You can elect to create or update a distribution table or to delete a distribution table. In either case, you must specify the project name and the name of the distribution table.

If you select option 1, the panel shown in Figure 16 is displayed.

----- CREATE OR UPDATE DISTRIBUTION TABLES ----- ROW 1 OF 13
COMMAND ==> SCROLL ==> HALF

Add, delete, or change version numbers and target groups for distribution
table: DIST
Enter the END command to save changes, or CANCEL to exit without saving.

	VERSION NUMBER	TARGET GROUP
''''	11	BOT1_____
''''	11	BOT2_____
''''	12	BOT1_____
''''	13	BOT2_____
	.	.
	.	.
	.	.

Figure 16. Create or Update Distribution Tables Panel

In the panel shown above, the member whose version number is 11 is promoted into the two entry-level libraries, BOT1 and BOT2. The members with version numbers 12 and 13 are each promoted into only one entry-level library, BOT1 and BOT2, respectively.

The apostrophes on the left define the line command area where you can enter commands such as insert (I), delete (D), and repeat (R). The line commands are useful when you update this list.

The primary commands available are CANCEL, LOCATE, and END. You can use the LOCATE command with either version number or target group.

If you select option 2 of the Specify Distribution Tables panel to delete a distribution table, the Confirm Delete panel, as shown in Figure 17, is displayed.

```
----- CONFIRM DELETE -----  
COMMAND ==> _  
  
PROJECT: PROJ  
DISTRIBUTION TABLE NAME: DIST  
  
INSTRUCTIONS:  
  
    Press ENTER key to confirm delete request.  
    Enter END command to cancel delete request.
```

Figure 17. Confirm Delete Panel

If you confirm the deletion, the distribution table will be deleted. However, library controls that refer to that distribution table are not deleted. You have to update the library controls that refer to the deleted distribution table.

When you create, update, or delete a distribution table, various checks are made to ensure that the distribution table can be created, updated, or deleted. The checks made are:

- Creation of a Distribution Table
 - To Create a Distribution Table:
 - The user must be an authorized project administrator.
 - The specified project must exist.
 - The specified project must not be in use by any other project administrator.
 - To Save a Created Distribution Table:

- For each group entered in the distribution table, controls must be defined for at least one library in that group.
- For each group entered in the distribution table, all libraries within that promotion hierarchy must be deactivated.
- For each group entered in the distribution table, all members belonging to any library using that group qualifier and the specified distribution table must be in the top group and available.
- The members of the library hierarchy must be available for update up to and including the level at which the distribution table is specified.
- For each library hierarchy associated with a group in a distribution table, only one library can have a distribution table specified. (Groups TOP and MIDDLE for the same hierarchy cannot both be in a distribution table.)

- Updating a Distribution Table

- To Access a Distribution Table for Update:
 - The user must be an authorized project administrator.
 - The specified project must exist.
 - The specified project must not be in use by any other project administrator.
 - For each group entered in the distribution table, all libraries using that hierarchy must be deactivated.
 - The members of the library hierarchy must be available for update up to and including the level at which the distribution table is specified.
- To Save an Updated Distribution Table:
 - For each group entered in the distribution table, controls must be defined for at least one library in that group.
 - For each group entered in the distribution table, all libraries within that promotion hierarchy must be deactivated.
 - For each group entered in the distribution table, all members belonging to any library using the group qualifier and the specified distribution table must be in the top group and available.

- The members of the library hierarchy must be available for update up to and including the level at which the distribution table is specified.
- For each library hierarchy associated with a group in a distribution table only one library can have a distribution table specified. (Groups TOP and MIDDLE from the same hierarchy cannot both be in a distribution table.)

Note: There does not have to be a library in the hierarchy for each group in the distribution table. This allows the user to delete groups out of the hierarchy before deleting them from the distribution table. Libraries must exist for all groups only when saving the distribution table.

- **Deleting a Distribution Table**

To Access a Distribution Table for Deletion:

- The user must be an authorized project administrator.
- The specified project must exist.
- The specified project must not be in use by any other project administrator.
- The specified distribution table must exist.
- For each group entered in the distribution table, all libraries using that group qualifier must be deactivated.

Note: For each group in the distribution table, there does not have to be a library in the hierarchy using that group. Thus, the user may delete the entire distribution table after some or all of the groups from the hierarchy have been deleted.

If any of the above checks fail, you will be notified by a message. The manner of continuing depends upon the check that has failed. Therefore, if you get a message, request the tutorial for that failed check to determine how to proceed.

ACTIVATE (OPTION 4)

For the example, you created the library structure, put the controls in place, defined the user set, and created and protected the data sets. In order to allow the library structure to be used, the controls must be activated. Option 4 on the Library Management Utilities panel allows you to activate the controls. When you select option 4, the panel shown in Figure 18 is displayed.

```
----- ACTIVATE OR DEACTIVATE CONTROLS -----  
OPTION ==> 1  
  
1 - Activate controls and display hierarchy structure  
2 - Deactivate controls  
  
PROJECT ==> ISPFEXAM  
TOP GROUP ==> PROD_ (* for all top groups)
```

Figure 18. Activate or Deactivate Controls Panel

The top-group name is required to activate or deactivate the controls for a promotion hierarchy. If you choose option 1, activate controls, and the activation is successful, a panel showing your structure is displayed. For our example, the panel is that shown in Figure 19.

```
HIERARCHY(IES) ACTIVATED - ISPFEXAM.PROD-----LINE 000000 COL 001 080
COMMAND ==> _                               SCROLL ==> CSR
***** TOP OF DATA *****
```

```
STRUCTURE FOR - ISPFEXAM          DATE: 83/06/30          TIME: 09:56
```

```
1 PROD          Where:
2 SYSTST        1, 2 ... 50 Indicates hierarchical position
  B DEPT1        B           Indicates bottom group
  B DEPT2
```

```
DEFINED TYPES
LOAD
MSGS
PLI
```

```
***** BOTTOM OF DATA *****
```

Figure 19. Library Structure Panel

Before you update library controls, you must deactivate the library controls. To do this, use option 2 on the Activate or Deactivate Controls panel. Only the person who deactivates the controls can activate them again.

When a library is active, the only controls you can update are user sets and member controls. You can also review the activity log or the controls when the library is active.

REVIEW (OPTION 5)

Selecting option 5 on the Library Management Utilities panel allows you to look at the log activity and the library controls. Anyone can select this option.

Selecting option 5 results in the display shown in Figure 20.

```
----- REVIEW ACTIVITY AND CONTROLS -----
OPTION ==> _

1  ACTIVITY LOG      -  Update and promote activity
2  CONTROL STATUS   -  Library control data
3  MEMBER STATUS    -  Member control data
```

Figure 20. Review Activity and Controls Panel

Option 1 allows you to look at the activity log. This log lists the promotion activities and update activities that have taken place.

Option 2 allows you to look at the library control data.

Option 3 allows you to look at the member control data to determine those members that were predefined and those that have been promoted into the controlled library.

Each of these options is discussed below.

Activity Log

When you select option 1, the Activity Log Review panel (Figure 21) is displayed.

----- ACTIVITY LOG REVIEW -----

OPTION ==> 2

- 1 - Browse activity log
- 2 - Print activity log

ISPF LIBRARY:

PROJECT	==>	ISPFEXAM	
TOP GROUP	==>	PROD	(* for all top groups)
TYPE	==>	PLI	(* for all types)
MEMBER	==>	*	(Name, truncated name, or * allowed)

Figure 21. Activity Log Review Panel

You specify the member whose log activity you want to review. If you specify an asterisk (*) for top group, type, and member, you can review the activities logged for every member in all controlled libraries.

Option 1 causes the log for the specified members to be displayed. This display is scrollable.

Option 2 causes the log activity data to be sent to the ISPF list data set. You can then obtain a hardcopy printout of the log activity data.

An example of a printout of an activity log for project ISPFEXAM is shown in Figure 22.

TYPE : PLI

MEMBER	GROUP	ACTION	USER ID	DATE	TIME	VER	MOD	COLLECT	REASON
AAA	SYSTST	EDITLOCK	FR2	83/11/21	11:05	01	00		
AAA	SYSTST	FREE	FR2	83/11/21	11:06	01	00		
AAA	SYSTST	EDITLOCK	FR2	83/11/29	16:54	01	00		
AAA	DEPT2	MOVE	FR2	83/11/29	17:03	01	01		PROBLEM REPORT 17
AAA	SYSTST	MOVE	FR2	83/11/29	17:27	01	01		
AAA	PROD	MOVE	FR2	83/11/29	17:28	01	01	RELEASE1	
BBB	PROD	EDITLOCK	MA2	83/11/29	16:56	01	00		
BBB	DEPT2	MOVE	MA2	83/11/29	17:26	01	01		
BBB	SYSTST	MOVE	MA2	83/11/29	17:27	01	01		
CCC	DEPT1	EDITLOCK	MA1	83/11/22	17:10	01	00		PROBLEM REPORT 43
CCC	DEPT1	FREE	MA1	83/11/22	17:11	01	00		
DDD	SYSTST	EDITLOCK	FR3	83/11/21	14:41	01	00		
DDD	DEPT2	MOVE	FR3	83/11/21	14:48	01	01		
DDD	DEPT2	EDITLOCK	FR3	83/11/22	09:35	01	01		

Figure 22. Sample Activity Log Listing

Note: The date information is displayed in the national format of the language being used.

The headings are:

MEMBER Member name

GROUP Group in which the action was done

ACTION The activity performed on the member

move the member was promoted to an entry-level library

free the member was made available for update

editlock the member was locked for update purposes. The member can be promoted or freed only by the person who accessed it. The person whose logon ID is listed is the only one who is allowed to change the member in the controlled library, which must be done by promoting the member from an uncontrolled library.

A discussion of these actions is given in the promotion of members on page 63.

USER ID	User who requested the action
DATE	Date, in national language format, when the action occurred
TIME	Time, in hh:mm 24-hour format, when the action occurred
VER	Version number
MOD	Modification level
COLLECT	Collection name, as specified on the Controls panel
REASON	Reason code as specified on the Promotion panel

If you want to use the data in the activity log to produce special reports, you must know the record layout. The record layout for the activity log, project.type.ACTLOG, is specified in Appendix B.

Control Status

When you select option 2 on the Review Activity and Controls panel, the Control Status Review panel (Figure 23) is displayed.

```

----- CONTROL STATUS REVIEW -----
OPTION ==> 2

1 - Browse control status
2 - Print control status
3 - Write control status to a data set

ISPF LIBRARY:

PROJECT    ==> ISPFEXAM
TOP GROUP  ==> PROD      (* for all top groups)
TYPE       ==> *        (* for all types)
MEMBER     ==> *        (Name, truncated name, or * allowed)

OUTPUT DATA SET                (Option 3 only)

DATA SET NAME ==>

```

Figure 23. Control Status Review Panel

You specify the member whose library control status you want to review. If you specify an asterisk (*) for top group, type, and member, you can review the library control status for every member in all top-level groups of the controlled library.

Option 1 causes the library control status for the specified members to be displayed. This display is scrollable.

Option 2 causes the library control data to be sent to the ISPF list data set. You can then obtain a hardcopy printout of the library control data.

Option 3 causes the library control data to be written to a data set that you specify. You specify the data set name where indicated on the panel. The data set will be allocated if it does not already exist. You can then do what you want with the library control data, such as formatting it in different ways for different reports. See Appendix B for record formats.

An example of a printout of a control status listing for project ISPFEXAM is shown in Figure 24.

LIBRARY CONTROL STATUS REVIEW

PROJECT: ISPFEXAM ADMINISTRATOR: LIBADM UPDATE IN PROGRESS: NO DATE: 83/11/21 TIME: 14:51

GROUP: PROD TARGET: TOP GROUP LEVEL: TOP

TYPE	PROMOTER	PACK	LOG			ENTRY ID	ACCESS ID CONTROL	PROMOTION EXIT NAME	PROMOTION EXIT TYPE	COLLECT NAME
			ACT	DIST	TAB					
LOAD		NO	NO							
MSGS		NO	NO							
	MEMBER	VER	MOD	GROUP		ACCESS ID	STATUS			
	EMSG1	01	00	PROD		FR1	AVAILABLE			
	EMSG2			PROD		MA1	PREDEFINED			
	SMSG1			PROD		FR3	PREDEFINED			
	SMSG2			PROD		MA2	PREDEFINED			

TYPE	PROMOTER	PACK	LOG			ENTRY ID	ACCESS ID CONTROL	PROMOTION EXIT NAME	PROMOTION EXIT TYPE	COLLECT NAME
			ACT	DIST	TAB					
PLI		NO	YES							
	MEMBER	VER	MOD	GROUP		ACCESS ID	STATUS			
	BBB	01	00	PROD		MA2	AVAILABLE			

GROUP: SYSTST TARGET: PROD LEVEL: 2

TYPE	PROMOTER	PACK	LOG			ENTRY ID	ACCESS ID CONTROL	PROMOTION EXIT NAME	PROMOTION EXIT TYPE	COLLECT NAME
			ACT	DIST	TAB					
LOAD	FR1	NO	NO							
MSGS	FR1	NO	NO							
	MEMBER	VER	MOD	GROUP		ACCESS ID	STATUS			
	CMSG1	01	00	SYSTST		FR2	AVAILABLE			

TYPE	PROMOTER	PACK	LOG			ENTRY ID	ACCESS ID CONTROL	PROMOTION EXIT NAME	PROMOTION EXIT TYPE	COLLECT NAME
			ACT	DIST	TAB					
PLI	USSET	NO	YES							

GROUP: DEPT1 TARGET: SYSTST LEVEL: BOTTOM

TYPE	PROMOTER	PACK	LOG			ENTRY ID	ACCESS ID CONTROL	PROMOTION EXIT NAME	PROMOTION EXIT TYPE	COLLECT NAME
			ACT	DIST	TAB					
LOAD	LIBADM	NO	NO			NO UNDEFINED MEMBERS				PROMCHEK
MSG	FR1	NO	NO			NO UNDEFINED MEMBERS				
PLI	USSET	NO	YES			PRIVATE				

MEMBER	VER	MOD	GROUP	ACCESS ID	STATUS
CCC	01	00	DEPT1	MA1	AVAILABLE

GROUP: DEPT2 TARGET: SYSTST LEVEL: BOTTOM

TYPE	PROMOTER	PACK	LOG			ENTRY ID	ACCESS ID CONTROL	PROMOTION EXIT NAME	PROMOTION EXIT TYPE	COLLECT NAME
			ACT	DIST	TAB					
LOAD	LIBADM	NO	NO							
MSG	FR2	NO	NO							
PLI	USSET	NO	YES			PRIVATE				

MEMBER	VER	MOD	GROUP	ACCESS ID	STATUS
DDD	01	01	DEPT2	FR3	FR3

***** END OF STATUS LISTING *****

Figure 24. Sample Control Status Listing

The fields are:

PROJECT INFORMATION

PROJECT	Project name
ADMINISTRATOR	Project administrator ID
UPDATE IN PROGRESS	Yes or no
DATE	Date of activity in national language format
TIME	Time of activity in hh:mm 24-hour format

GROUP INFORMATION

GROUP	Group name
TARGET	Target group name
LEVEL	Identifier for the level of a group within its hierarchy
TYPE	Type name
PROMOTER	Promoter ID
PACK	Packed data indicator (yes or no)
LOG ACT	Activity log indicator (yes or no)
DIST TAB	Distribution table name
ENTRY ID	Identification of who can promote an undefined member to a controlled library
ACCESS ID CONTROL	Type of access allowed (limited, open, or private) limited only those in the entry ID can access the member to update it open anyone can access the member to update it private only the user who promotes the member into the controlled library can access the member to update it
PROMOTION EXIT NAME	Name of exit for performing additional operations on member before promotion to entry-level library
PROMOTION EXIT TYPE	Promotion exit type (command or program)
COLLECT NAME	Collection name

MEMBER INFORMATION

MEMBER	Member name
---------------	-------------

VER	Version number
MOD	Modification level
GROUP	Group name
ACCESS ID	Access ID
STATUS	Indicator of member availability for update
	AVAILABLE available for update
	PREDEFINED member has been predefined and has not yet been promoted into a controlled library
	LOGON ID the member has been edit-locked by the user whose ID is specified. No other user may promote the member until the user who edit-locked the member promotes or frees it.

If you want to use the data in the control status for special reports, you have to know the record layout. The data set name is the name you specified in the Control Status Listing panel. The record layout is specified in Appendix B.

Member Status

When you select option 3 on the Review Activity and Controls panel, the Member Status Review panel (Figure 25) is displayed.

```
----- MEMBER STATUS REVIEW -----
OPTION ==> 2

1 - Browse member status
2 - Print member status
3 - Write member status to a data set

ISPF LIBRARY:

PROJECT   ==> ISPFEXAM
TOP GROUP ==> PROD           (* for all top groups)
TYPE      ==> *             (* for all types)
MEMBER    ==> *             (Name, truncated name, or * allowed)

OUTPUT DATA SET                (Option 3 only)

DATA SET NAME ==>
```

Figure 25. Member Status Review Panel

You specify the member whose status you want to review. If you specify an asterisk (*) for top group, type, and member, you can review the status for every member in all top-level groups of the controlled library.

Option 1 causes the status for the specified members to be displayed. This display is scrollable.

Option 2 causes the member status data to be sent to the ISPF list data set. You can then obtain a hardcopy printout of the member status data.

Option 3 causes the member status data to be written on a data set that you specify. You specify that data set name where indicated on the panel. The data set will be allocated if it does not already exist. You can then do what you want with the member status data, such as formatting it in different ways for different reports. See Appendix B for the record format.

An example of a printout of a member status listing for project ISPFEXAM is given in Figure 26.

LIBRARY MEMBER STATUS REVIEW

PAGE 1

PROJECT: ISPFEXAM UPDATE IN PROGRESS: NO DATE: 83/11/21 TIME: 14:57

MEMBERS FOR HIERARCHY: ISPFEXAM.PROD.MSGS

MEMBER	VER	MOD	GROUP	ACCESS ID	STATUS
-----	---	---	-----	-----	-----
CMSG1	01	00	PROD	FR2	*LOCKED*
EMSG1	01	00	PROD	FR1	AVAILABLE
EMSG2			PROD	MA1	PREDEFINED
SMSG1			PROD	FR3	PREDEFINED
SMSG2			PROD	MA2	PREDEFINED

MEMBERS FOR HIERARCHY: ISPFEXAM.PROD.PLI

MEMBER	VER	MOD	GROUP	ACCESS ID	STATUS
-----	---	---	-----	-----	-----
AAA			PROD	FR2	*LOCKED*
AAA	01	00	SYSTST	FR2	AVAILABLE
BBB	01	00	PROD	MA2	AVAILABLE
CCC	01	00	DEPT1	MA1	AVAILABLE
CCC			PROD	MA1	*LOCKED*
DDD	01	01	DEPT2	FR3	FR3
DDD			PROD	FR3	*LOCKED*
DDD	01	00	SYSTST	FR3	*LOCKED*

***** END OF STATUS LISTING *****

Figure 26. Sample Member Status Review Listing

The fields are:

PROJECT INFORMATION

PROJECT	Project name
UPDATE IN PROGRESS	Yes or no
DATE	Current date in national language format
TIME	Current time in hh:mm 24-hour format

MEMBER INFORMATION

MEMBER	Member name
VER	Version number
MOD	Modification level
GROUP	Group name
ACCESS ID	Access ID
STATUS	Indicator of member availability for update
AVAILABLE	available for update
PREDEFINED	member has been predefined and has not yet been promoted into a controlled library
LOGON ID	member has been taken out for update by the user with the specified logon ID
LOCKED	the member can be accessed for update only in a lower level of the hierarchy.

If you want to use the data in the member status for special reports, you must know the record layout. The data set name is the name you specified in the Control Status Listing panel. The record layout is specified in Appendix B.

LIBRARY MAINTENANCE

Library maintenance involves keeping the libraries and the library controls current by adding or deleting libraries or controls when necessary.

To help in maintaining the libraries, you can obtain listings of the activity log, control status, and member status. You can browse through displays of these listings, get printouts of the listings, or both browse and print out the data for which you want a hardcopy listing. The listings can be obtained by selecting option 5 from the Library Management Utilities panel.

The tables created for control purposes, such as the distribution table and user set, are dynamic. They can be changed as need dictates. All panels used to create libraries can also be used to update libraries. Hence, the panels used to create libraries and specify controls are the panels used to update libraries and controls. However, you must deactivate the controls when performing most maintenance functions. You can update user sets and member controls when they are active. However,

after completing the maintenance, be sure to activate all deactivated controls again so that the libraries can be used.

Library controls can be deleted by selecting option 2 of the Specify Library Controls panel. However, to delete library controls, the library cannot contain any promoted members.

A user set can be deleted and a distribution table can be deleted by choosing option 2 of the Specify User Set panel and option 2 of the Specify Distribution Table panel, respectively. However, the library controls that reference the user set or distribution table are not automatically deleted. You will have to update those controls.

CHAPTER 3. LIBRARY USE

The controlled libraries are ISPF libraries that are used with the PDF tools. There is one important difference, however, in using controlled libraries. In order to edit or update a member of a controlled library, you must bring that member into an uncontrolled library to work on it. When you have finished editing that member, you return it to the controlled library by means of the promotion process.

In this chapter, we will look at the actions taken by a user to:

- Access a member from a controlled library
- Promote a member to a controlled library
- Promote a member from one level to another within a controlled library.

We will continue to use the example in Chapter 2 to illustrate the actions.

You must be careful to have the same project and type for the controlled library and the private library (the uncontrolled library) in order to access a member from a controlled library for update.

When you access a member for editing (described in the next section, "Accessing a Library Member"), that member becomes edit-locked; that is, that member is not available for update by anyone other than you. The member is locked under your logon ID, making you the only person who can update the member and promote it into the controlled library. The member is said to be edit-locked. The member becomes available when you promote the member to an entry-level library or free the member. A discussion of freeing a member is on page 63.

There is another type of locked member. If a member is in two or more levels of a hierarchy with the same name in all levels, it is locked in all of the higher levels and available for updating only from the lowest level of the hierarchy in which it appears. For example, if you should have a member called MEMBERA in the top-group library of a library hierarchy and, also, a more recent copy of MEMBERA in the entry-level library, MEMBERA is locked in the top-group library. It can be accessed for update from the entry-level library. This ensures that updates to the member will always be made to the most recent copy.

Accessing a Library Member

To access a library member from a controlled library for updating, you concatenate the library hierarchy to a private library. The most recent version of the member is then available for you to edit in your private library.

To access the member, select option 2 (Edit) on the PDF Primary Option menu. The Edit Entry panel, Figure 27, is displayed.

```
----- EDIT - ENTRY PANEL -----
COMMAND ==>

ISPF LIBRARY:
  PROJECT ==> ISPFEXAM
  GROUP   ==> FR2      ==> DEPT1      ==> SYSTST      ==> PROD _
  TYPE    ==> PLI
  MEMBER  ==>                (Blank for member selection list)

OTHER PARTITIONED OR SEQUENTIAL DATA SET:
  DATA SET NAME ==>
  VOLUME SERIAL  ==>                (If not cataloged)

DATA SET PASSWORD ==>                (If password protected)

PROFILE NAME      ==>                (Blank defaults to data set type)

INITIAL MACRO     ==>

MIXED MODE        ==>                (Specify YES or NO)

FORMAT NAME       ==>
```

Figure 27. Edit Entry Panel

The project, group, and type fields have already been filled in. You will note that the controlled libraries are concatenated to the private library in group FR2. DEPT1 is concatenated to FR2, SYSTST to DEPT1, and PROD to SYSTST. As you recall, PROD is the top-level group, SYSTST the middle-level group, and DEPT1 a bottom-level, or entry-level, group.

You must select the member and then change it to get it into your private library. If you are not authorized to access the member for update, you will be told at selection time. If the member is locked, you will be told at selection time. The member may be edit-locked, meaning that someone else has already accessed the member to update it. It may also be locked because you are not selecting the most recent

copy. The latter situation can occur if you leave a group out when specifying the concatenation.

As with any ISPF edit operation, there are two ways of selecting the member you want to update.

The first way to select a member is to specify the member name on the Edit Entry panel. For example, to select member BBB from the library you would specify:

```
MEMBER ==> BBB
```

The first occurrence of member BBB is then displayed.

The second way is to select a member is to leave the member name field blank, as in the example above. This results in the display of the member list, an example of which is shown in Figure 28.

```
EDIT --- ISPFEXAM.FR2.PLI -----
COMMAND ==>                                SCROLL ==> PAGE
  NAME          LIB VV.MM  CREATED  LAST MODIFIED  SIZE  INIT  MOD  ID
AAA             3  01.00  83/07/26 83/07/26 15:13   2    2    0  FR2
S BBB           4  01.00  83/07/26 83/07/26 15:15   4    4    0  MA2
CCC             2  01.00  83/07/26 83/07/26 15:16   4    4    0  MA1
DDD             1  01.00  83/07/27 83/07/27 08:07   2    2    0  FR3
***END***
```

Figure 28. Sample Member Selection List

Note: The date is displayed in the national format of the language being used.

This list shows you all the members that are now available to you in your private library. The list also indicates the library in which the first occurrence of the member is found, in the column labeled LIB. This column contains numbers (1 to 4) that identify the library in which a member can be found. These numbers correspond to the four group entry fields on the Edit Entry panel. The meanings of the numbers for our example are:

NUMBER	FIRST LIBRARY IN WHICH MEMBER IS FOUND
1	ISPFEXAM.FR2.PLI
2	ISPFEXAM.DEPT1.PLI
3	ISPFEXAM.SYSTST.PLI
4	ISPFEXAM.PROD.PLI

Selecting a member causes that member to be displayed and to be locked in the control file with your ID. For our example, member BBB was selected by entering "S" next to BBB on the panel shown above. You can then update the selected member. The updated member will be placed in your private library. You can then return it to the controlled library by promoting it. We will look at promotion in the next section.

Either way, you get the member from the first library in which it is found.

A member can exist in more than one level of the library hierarchy. However, each level in the library structure will have a different form of the member.

Let us illustrate the information in the preceding paragraph with an example. Member DDD has been promoted to a middle-level library, group SYSTST. It was then obtained, updated, and placed in the private library ISPFEXAM.FR2.PLI.

We have not yet shown that member DDD is in the middle-level library and, if it is, that it is different from the member in the private library. To verify that member DDD is in library PLI of group SYSTST, we can use the Browse option, option 1 on the PDF Primary Option Menu. If the member is in the library, the Browse option displays the contents of the member.

For our example, when you select option 1 on the PDF Primary Option Menu, the panel shown in Figure 29 is displayed.

----- BROWSE - ENTRY PANEL -----

COMMAND ==>

ISPF LIBRARY:

PROJECT ==> ISPFEXAM

GROUP ==> SYSTST ==> ==> ==>

TYPE ==> PLI

MEMBER ==> DDD _ (Blank for member selection list)

OTHER PARTITIONED OR SEQUENTIAL DATA SET:

DATA SET NAME ==>

VOLUME SERIAL ==> (If not cataloged)

DATA SET PASSWORD ==> (If password protected)

| MIXED MODE ==> (Specify YES or NO)

| FORMAT NAME ==>

Figure 29. Browse Entry Panel

The display of member DDD in ISPFEXAM.SYSTST.PLI is shown in Figure 30.

```
BROWSE --- ISPFEXAM.SYSTST.PLI(DDD) - 01.01 -----LINE 000000 COL 001 080
COMMAND ==> _                                SCROLL ==> PAGE
***** TOP OF DATA *****
FOXX TO CRONIN AND BACK TO FOXX
AND THEIR WORTHY OPPONENTS LOST THEIR SOCKS.
***** BOTTOM OF DATA *****
```

Figure 30. Browse Display for Member DDD in Private Library

Using the Edit option, the display of member DDD in library ISPFEXAM.FR2.PLI is shown in Figure 31.

```
EDIT --- ISPFEXAM.FR2.PLI(DDD) - 01.02 ----- COLUMNS 001 072
COMMAND ==> _                               SCROLL ==> HALF
***** ***** TOP OF DATA *****
000100   FOXX TO CRONIN AND BACK TO FOXX,
000200   AND THEIR WORTHY OPPONENTS LOST THEIR SOCKS.
000300   FOXX TO CRONIN AND BACK TO FOXX,
000400   IT WAS ALMOST AS BAD AS THE CHICKEN POX.
***** ***** BOTTOM OF DATA *****
```

Figure 31. Edit Display for Member DDD in Middle-Level Library

Thus, there are two forms of member DDD in two different libraries in the hierarchy. The updated member is in the private library. Promoting member DDD will put the updated member into the entry-level library, replacing what was previously there, and will remove the member from the private library.

Note: LMF does not allow a member to be updated, simultaneously, by more than one person. When a member is accessed by means of the Edit Entry panel, it is edit-locked; that is, it is marked as being "out for update." That member cannot be accessed by any other user by means of the Edit Entry panel for the purpose of updating and promoting it back to a controlled library until it is free; that is, until it is promoted back to the entry-level library. However, the user who originally edit-locked the member can obtain the member again without first promoting it into the controlled library.

If you attempt to access a member that was not edit-locked with your logon ID, the error panel shown in Figure 32 is displayed.

```

----- ISPF LIBRARY SERVICES ERROR -----
COMMAND ==> _

*****
*                                                                 *
* ERROR DESCRIPTION:                                           *
*                                                                 *
*   EDIT LOCK FAILED                                           *
*   THE MEMBER IS NOT FREE.                                     *
*                                                                 *
* INSTRUCTIONS:                                               *
*                                                                 *
*   Press ENTER key to proceed with Edit.                     *
*   Enter END command to terminate Edit.                       *
*                                                                 *
*****

```

Figure 32. ISPF Library Services Error Panel

If you only want to have the member in your private library and do not intend to promote it, press the ENTER key. You will then be able to proceed with your changes. If you intend to promote the member after you change it, you cannot do so now. You cannot promote a member that is not edit-locked with your logon ID. You must enter the END command on this panel, and then either wait until the member is freed or request that the current owner promote the member so it will be available to you. To find the ID of the person who edit-locked the member, review the member controls (option 8.5.3).

Promotion To the Controlled Library

You promote members by using the PDF Move/Copy Utility, PDF option 3.3. Two options allow you to promote members: option P promotes a member, while option PP promotes a member and prints it.

When you promote a member to a controlled library from a private library, the Move/Copy utility does not know the entry-level library to

which you want to move the member. Therefore, you must specify the library that will receive the promoted member; that is, the target library. The target library must be specified since a member can be promoted to any entry-level library from a private library, provided you have authority to promote.

After a successful promotion, the promoted member is deleted from the private library. In the event of a system failure, you will be able to promote that member again.

To illustrate promotion of a member from a private library to an entry-level library, we will use our example. In the last section, we accessed member DDD of the middle-level library PLI. We updated member DDD. Now we want to promote it to the entry-level library. For our example, the Move/Copy Utility panel is shown in Figure 33.

```
----- MOVE/COPY UTILITY -----
OPTION ==> P

C - Copy data set or member(s)          CP - Copy and print
M - Move data set or member(s)         MP - Move and print
P - Promote data set or member(s)      PP - Promote and print

SPECIFY "FROM" DATA SET BELOW, THEN PRESS ENTER KEY

FROM ISPF LIBRARY:
PROJECT ==> ISPFEXAM
GROUP   ==> FR2
TYPE    ==> PLI
MEMBER  ==> DDD_          (Blank for member list, * for all members)

FROM OTHER PARTITIONED OR SEQUENTIAL DATA SET:
DATA SET NAME ==>
VOLUME SERIAL ==>          (If not cataloged)

DATA SET PASSWORD ==>      (If password protected)
```

Figure 33. Move/Copy Utility Panel

If you leave the member name field blank, you will get a member selection list. For a discussion of the member selection list, see ISPF/PDF for MVS Program Reference. This manual also contains a discussion of promoting members with aliases.

Since the requested promote operation is from a private library (group FR2), the promote utility does not know what the target library is; that is, where to promote this member. In this case, the utility asks for identification of the target library by displaying a panel requesting that information. For our example, the panel requesting the target library is shown in Figure 34.

```
PROMOTE --- FROM ISPFEXAM.FR2.PLI(DDD) -----  
COMMAND ==>  
  
SPECIFY "TARGET" CONTROLLED LIBRARY BELOW.  
  
TO ISPF LIBRARY:  
PROJECT ==> ISPFEXAM  
GROUP   ==> DEPT1  
TYPE    ==> PLI  
MEMBER  ==>          (Blank unless member is to be renamed)  
  
ACTION   ==> MOVE      (MOVE to copy and delete source  
                       FREE to only delete source)  
  
REASON CODE ==>  
  
PACK DATA ==>          (YES, NO, or blank to default to library controls)
```

Figure 34. Move/Copy Utility - Target Library Specification Panel

Three fields in the panel above are new:

ACTION This field specifies whether a normal promotion of the member is to occur, or the member is to be made available (freed) for update. The latter action may be specified if you do not want to promote the member for some reason, but want to make the member available to others. The specified actions are:

MOVE Promotion in which the member is moved to the target library and deleted from the private library. The member becomes available for update; that is, it is no longer locked by your logon ID.

FREE Make the member available, no longer locked by your logon ID. The member is not moved to the target library, but is deleted from the private library.

REASON CODE This is a 26-character field that appears in the activity log. You can use it for tracking, testing in a user exit, or for any other purpose.

PACK DATA You can use this field to override the library control. Leaving this field blank defaults to the packed data library control specification. If the data is packed (or unpacked) when promoted into an entry-level library, it will remain packed (or unpacked) throughout each subsequent promotion.

PACK uses a unique ISPF data compression routine. Attempts to access or execute the data outside of PDF can cause unpredictable results. See the description of the Edit PACK command in ISPF/PDF for MVS Program Reference for more information.

You will be notified by a message on the Move/Copy Utility panel whether the promotion was successful. For a successful promotion, the message is:

MEMBER xxx PROMOTED

where xxx is the member name. For our example, the message received is:

MEMBER DDD PROMOTED

If the promotion is not successful, you will get the message:

PROMOTE FAILED

Entering the HELP command will give you additional information on the reason for the failure.

Promotion Within the Controlled Library

Now that member DDD has been promoted to an entry-level library, we want to promote it to the middle-level library from which it was accessed for updating. Promotion within a controlled library is accomplished with the Move/Copy Utility. The promotion of member DDD to the middle-level library is specified as shown in Figure 35.

```

----- MOVE/COPY UTILITY -----
OPTION ==> P

C - Copy data set or member(s)      CP - Copy and print
M - Move data set or member(s)     MP - Move and print
P - Promote data set or member(s)  PP - Promote and print

SPECIFY "FROM" DATA SET BELOW, THEN PRESS ENTER KEY

FROM ISPF LIBRARY:
PROJECT ==> ISPFEXAM
GROUP   ==> DEPT1
TYPE    ==> PLI
MEMBER  ==> DDD _      (BLANK FOR MEMBER LIST, * FOR ALL MEMBERS)

FROM OTHER PARTITIONED OR SEQUENTIAL DATA SET:
DATA SET NAME ==>
VOLUME SERIAL ==>      (If not cataloged)

DATA SET PASSWORD ==>      (If password protected)

```

Figure 35. Move/Copy Utility Panel - Promotion into a Middle-Level Library

In this case, the utility knows the target library, so it does not request it. The target library is known from the hierarchical library controls that have been set up. The target library must be a library of the same type as the one from which the promotion was requested.

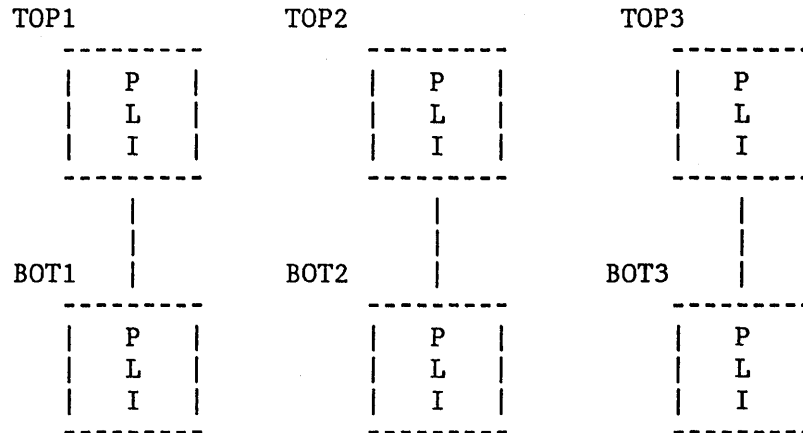
All promotions into a controlled library and within a controlled library are performed by the Move/Copy Utility. The only difference is that the entry-level library must be specified for promotion to a controlled library. The utility requests that information from you when it is needed.

Changing Member Version Numbers

If a distribution table is used, you may at some point need to change the version numbers of the members in your hierarchy. For instance, if you have a system of programs that run in three library hierarchies, at some point a program that is common to all three hierarchies may have to be changed so that there is a different version in each hierarchy. Conversely, you might have three different versions of the same program in the three library hierarchies, which can be made into a common program.

For example, let's say that we have a two-level hierarchy for a set of programs that run in each of three environments.

Project: EXAMPLE1



The first library hierarchy consists of the entry-level library EXAMPLE1.BOT1.PLI and its target library EXAMPLE1.TOP1.PLI. In the second library hierarchy, the two groups are top group TOP2 and bottom group BOT2. There is a PLI library in each of these groups. Libraries EXAMPLE1.BOT3.PLI and EXAMPLE1.TOP3.PLI make up the third library hierarchy.

The distribution table could look like this:

VERSION NUMBER	TARGET GROUP
50	BOT1 _____
50	BOT2 _____
50	BOT3 _____
51	BOT1 _____
52	BOT2 _____
53	BOT3 _____

In this distribution table, all programs common to all three environments have version code 50. Programs for the first environment only have version code 51. If the program is dependent on the second operating system, the version code is 52. Programs that only work in the third operating system have version code 53.

Changing a Member from One Common Version to Several Different Versions

In the first case, you would have to change the version numbers of the member in all three hierarchies from the version number for common programs to the version number for each individual environment.

To change the version code of a member with a version code of 50 to version codes 51, 52, and 53, you must change the version numbers one at a time. To change the version codes you must to perform the following steps:

1. Edit the member from the first library hierarchy. Remember to concatenate your private library ahead of the controlled libraries on the Edit Entry Panel.
2. Change the version number to the proper one for the environment. In the example, we would change the version number to 51.
3. Use the Move/Copy Utility, PDF option 3.3, to promote the member to the desired entry-level library. In this case, you would specify the target library to be EXAMPLE1.BOT1.PLI.
4. Edit the member from the library hierarchy for the second library hierarchy, concatenating those libraries to your private library.
5. Again, change the version number to the proper one for the library hierarchy. This time, we would change the version number to 52.
6. Use the Move/Copy Utility, PDF option 3.3, to promote the member to the desired entry-level library, which would be EXAMPLE1.BOT2.PLI in the example.
7. Continue to edit-lock the member, change the version number and promote the member to the appropriate library until all of the members with that name have been changed to the proper version code. In this example, we would have to go through the same steps for the third environment before we would be finished.

Changing A Member from Several Different Versions to One Common Version

In the second case, you would have to change the version numbers of the member in all three hierarchies from the version number for each individual environment to the version number for common programs. Since you cannot promote a member to a library that you did not edit-lock it in, you cannot merely change the version number of one of the members. The following steps allow you to change the version numbers for programs in the individual library hierarchies to the version number for programs common to many library hierarchies.

1. Edit one of the members, concatenating your private library ahead of the controlled libraries. You must **not** start with the member that is going to be made common. That is, if the member that is currently version 52 in the second library hierarchy is the one that

you want to be made common, start with the first or the third hierarchy. Save the one you want to keep for last.

2. Use the Library Utility, PDF option 3.1, to delete the member from your private library.
3. Continue editing the member, saving the member in your private library, and deleting it until you have deleted all but one of the members with that name. Again, the member you want to keep should be the only one left with that name in the library hierarchies affected by the distribution table.
4. Change the version number of the member to the version number for common programs. It would be version code 50 in our example. Use the Move/Copy Utility, PDF option 3.3, to promote the member to a library hierarchy. Because of the distribution table the member will be promoted to all of the library hierarchies. For example, if you specify EXAMPLE1.BOT1.PLI as the target for the promotion, the member is also promoted to EXAMPLE1.BOT2.PLI and EXAMPLE1.BOT3.PLI. This promotion succeeds because you have edit-locked this member in all target libraries.

These guidelines apply whether you have two groups or fifty groups in your distribution table. The same considerations apply for the different combinations that could occur if you have programs that are common to some library hierarchies, but are different in one or more other library hierarchies.

APPENDIX A. USER EXIT EXAMPLE

If you specify a user exit name and user exit type on the Create or Update Library Controls panel (see page 21), when you request that a member be promoted to a controlled library, the user exit will be taken prior to promoting the member. Usually the user exit is specified so that you can do some checking, validating, or modifying of the member before promoting it. However, you can use the user exit for any purpose you want.

The user exit name PROMCHEK and user exit type COMMAND were specified for the CLIST example presented below. This example checks some variables. If all checks are good, the promotion takes place. If any check fails, the promotion of the member does not take place.

In the command or program, any, or all, of the ISPF variables can be used.

```

PROC 0
/*****/
/*
/* THIS CLIST IS THE 'USER EXIT' FOR PROMOTION INTO
/* ISPFEXAM.DEPT1.PLI
/*
/*
/*****/
ISPEXEC CONTROL ERRORS RETURN
SET RC = 0
  ISPEXEC VGET (ZLTPRJ, -
                ZLTGRP, -
                ZLTTYP, -
                ZLTMEM, -
                ZLFPRJ, -
                ZLFGRP, -
                ZLFTYP, -
                ZLFMEM, -
                ZLFDSN, -
                ZLFVOL, -
                ZLFPWD, -
                ZLACT, -
                ZLRCD, -
                ZLPAC) SHARED          /* 14 VARIABLES */
/*****/
/* THE LIBRARY MANAGEMENT VARIABLES ARE: */
/* ZLTPRJ - TO PROJECT NAME */
/* ZLTGRP - TO GROUP NAME */
/* ZLTTYP - TO TYPE */
/* ZLTMEM - TO MEMBER NAME */
/* ZLFPRJ - FROM PROJECT NAME */
/* ZLFGRP - FROM GROUP NAME */
/* ZLFTYP - FROM TYPE */
/* ZLFMEM - FROM MEMBER NAME */
/* ZLFDSN - FROM DATA SET NAME */
/* ZLFVOL - FROM VOLUME SERIAL */
/* ZLFPWD - DATA SET PASSWORD */
/* ZLACT - ACTION */
/* ZLRCD - REASON CODE */
/* ZLPAC - PACK DATA */
/*****/

/*****/
/*
/* EXAMPLES OF LOGIC WHICH CAN DYNAMICALLY STOP THE
/* PROMOTION PROCESS BY RETURNING A NON-ZERO RETURN CODE
/*
/*
/*****/

```

```

/*****
/*          CHECK PROJECT NAME          */
/*****

IF &ZLTPRJ = ISPFPROJ THEN          +
  SET &RC = 4
ELSE                                  +

/*****
/*          CHECK TYPE IS PLI          */
/*****

DO
  IF &ZLTTYP = PLI THEN              +
    SET &RC = 8
  ELSE                                  +

/*****
/*          CHECK ACTION IS MOVE        */
/*****

DO
  IF &ZLACT = MOVE THEN              +
    SET &RC = 12
  ELSE                                  +

/*****
/* CHECK FIRST SEVEN CHARACTERS OF REASON CODE */
/*****

DO
  IF &SUBSTR(1:7,&ZLRCD) = PROBLEM THEN          +
    SET &RC=16
  ELSE                                  +

/*****
/*          CHECK IF DATA IS PACKED    */
/*****

DO
  IF &ZLPAC = NO THEN                  +
    SET &RC = 17
END
END
END
EXIT CODE(&RC)

```


A return code of 0 indicates that all checks were successful, so the member is promoted to the controlled library. If the return code is something other than 0, at least one check failed and the member is not promoted. You will need CLISTS or programs that specify what actions to take for each test failure.

APPENDIX B. RECORD FORMATS

Activity Log

The format of the records in the activity log data set is:

Member name	char(8)
Group name	char(8)
Action type	char(1)
L - Edit-lock	
M - Move	
F - FREE	
Requester's user id	char(8)
Date of this request (national language date format)	char(8)
Time of this request (hh:mm)	char(5)
Time of request in seconds	char(2)
Version identifier	char(8)
Modification level	char(2)
Collection name	char(8)
Reason on promote	char(26)
Reserved	char(6)

Status Listing

The following format is utilized for all status listing records written when the data set options 8.5.2.3 and 8.5.3.3 are selected. Each record consists of a sort area and a data area. The sort area has fields common to all types of output records. The data area has different information depending upon the type of record being written.

Data Set Record Format

----- SORT AREA -----		
BYTE	FIELD NAME	DESCRIPTION
-----	-----	-----
1-4	Promote hierarchy number	Fixed(31) ¹
5-8	Promote hierarchy level	Fixed(31) ²
9-16	Group name	Char(8)
17-24	Type name	Char(8)
25-32	Member name	Char(8)
33-34	Record type	Char(2) ³
35-45	Not currently used	Char(11)
----- DATA AREA -----		
46-160	Insert a description below	Char(115)

¹ Groups are numbered in preorder sequence with top groups in alphabetical order. Each group has a number. These numbers are sequential with the exception of illegally defined groups, which are numbered 999999.

² Hierarchy level indicates the depth of the group within the hierarchy. All top groups are on level 1. Groups having top groups as targets are level 2, and so on.

³ Possible record types are A0=Project record, CO=Group record, 10=Type record, 80=Member record.

Data Area Format For Specific Data Records

Project Record

<u>BYTE</u>	<u>FIELD NAME</u>	<u>DESCRIPTION</u>
46-53	Project name	CHAR(8)
54	Blank	CHAR(1)
55-62	Project administrator	CHAR(8)
63	Blank	CHAR(1)
64-71	Updater (blank if not being updated)	CHAR(8)
72	Blank	CHAR(1)
73-80	Date	CHAR(8)
81	Blank	CHAR(1)
82-89	Time	CHAR(8)
90-160	Blank	CHAR(71)

Group Record

<u>BYTE</u>	<u>FIELD NAME</u>	<u>DESCRIPTION</u>
46-53	Group name	CHAR(8)
54	Blank	CHAR(1)
55-62	Target group name	CHAR(8)
63	Blank	CHAR(1)
64	Group Position (T=Top group, O=Only group (both Top group and Bottom group), M=Middle group (not a top or a bottom group), E=Entry group)	CHAR(1)
65	Blank	CHAR(1)
66-73	Deactivator (User id, User set or blank if active)	CHAR(8)
74-160	Blank	CHAR(87)

Type Record

<u>BYTE</u>	<u>FIELD NAME</u>	<u>DESCRIPTION</u>
46-53	Type name	CHAR(8)
54	Blank	CHAR(1)
55-62	Promoter ID	CHAR(8)
63	Blank	CHAR(1)
64	Pack (Y=Yes, N=No)	CHAR(1)
65	Blank	CHAR(1)
66	Log activity (Y=Yes, N=No)	CHAR(1)
67	Blank	CHAR(1)
68-75	Distribution table name	CHAR(8)
76	Blank	CHAR(1)
77-84	Type entry ID	CHAR(8)
85	Blank	CHAR(1)
86	Access type (C=No undefined members L=Limited, O=Open, P=Private)	CHAR(1)
87	Blank	CHAR(1)
88-95	Promotion exit name	CHAR(8)
96	Blank	CHAR(1)
97	Promotion exit type (C=Command P=Program)	CHAR(1)
98	Blank	CHAR(1)
99-106	Collection name	CHAR(8)
107-160	Blank	CHAR(54)

Member Record

<u>BYTE</u>	<u>FIELD NAME</u>	<u>DESCRIPTION</u>
46-53	Member name	CHAR(8)
54	Blank	CHAR(1)
55-56	Version number	CHAR(2)
57	Blank	CHAR(1)
58-59	Modification number	CHAR(2)
60	Blank	CHAR(1)
61-68	Group name	CHAR(8)
69	Blank	CHAR(1)
70-78	Access ID (Logon ID, User set name, *OPEN*=Access is open, *LOCKED*=Member may be available at a lower hierarchy level.	CHAR(9)
79	Blank	CHAR(1)
80-88	Status (Logon ID, User set name, available, or predefined)	CHAR(9)
89-160	Blank	CHAR(72)

GLOSSARY

Access Control. Specifies how ownership is determined when an undefined member is promoted into an entry-level library. There are three categories:

- Open** anyone can access this member to update it.
- Limited** only those in the entry ID can access this member.
- Private** only the user entering this member can access it.

Activity Log. A set of records that contain information describing the promote and update activities that have taken place for members of a library hierarchy.

Authorized Entry ID. Specifies the person, or persons, who can promote an undefined member to a controlled library. It is either the logon ID of the person so authorized or the name of a user set containing logon IDs of the persons so authorized.

Authorized Promoters. Specifies the person, or persons, who can promote a member from one level to another within a controlled library. It is either the logon ID of the person so authorized, or the name of a user set containing logon IDs of the persons so authorized.

Bottom Group. A group that is at the lowest level of a promotion hierarchy. A bottom group is not a target group for any other group.

Collection Name. An identification that is specified at the library level by the library administrator. It is recorded in the activity log whenever a member is promoted to that library level.

Controlled Group. A collection of controlled libraries having a common project and group name.

Controlled Library. An ISPF library that has been identified as a library to which users must have specific authority for access for updates and promotion activity.

Controlled Project. A collection of controlled groups having a common project name.

Distribution Table. A table containing those groups identifying the multiple hierarchies that a specified member is to be promoted to. Members are promoted into multiple hierarchies by means of version numbers.

Edit-Lock. If you edit a member, concatenating your private library ahead of the controlled library that contains the member, the member becomes locked under your logon ID. This means that you are the only person allowed to edit the member until you promote the member back into the controlled library.

Entry-Level Library. A library that is associated with the bottom group in a promotion hierarchy. When a member is promoted to a controlled library, the promotion must be into an entry-level library.

Free. A member is free if it is available for update. If a member is not locked, it is free. If a member is edit-locked, it is freed when it is promoted.

When you are promoting a member, if you specify the action to be free, the promotion does not move the member into the controlled library. Free deletes the member from the source library and

makes it available for update in the controlled library.

Level. Level identifies the position of a group within its hierarchical structure. It could be 'top', 'bottom', or a number for each group, where one (1) is the level number for the top group.

Library Administrator. The person, or persons, who creates a controlled project and specifies controls for the groups, libraries, and members associated with that project.

Library Hierarchy. A promotion hierarchy in which all the libraries are of the same type.

Locked. A locked member is unavailable for update. There are two kinds of members that are locked.

- A member is locked if there is a member with the same name lower in the hierarchy. For example, if you have MEMBERA in the top group library of a library hierarchy, and a more recent copy in the entry level library, then MEMBERA is locked in the top group library. This ensures that anyone updating the member will get the most recent copy.
- A member is locked if it is being edited. If you edit a member, concatenating your private library ahead of the controlled library that contains the member, the member becomes locked under your logon ID. This means that you are the only person allowed to edit the member, until you promote the member back into the controlled library.

Promote. The action by which a member is moved into or within a controlled library structure.

Promotion Hierarchy. An ordered set of related controlled libraries that a member is promoted through during a development or maintenance process. For each group, the library administrator specifies the hierarchy.

Target Group. The destination group of a member being promoted from a controlled group. The target group must be a controlled group.

Top Group. A group at the highest level of a promotion hierarchy. A top group has no target group.

Undefined Member. A member that does not exist in a controlled library or does not have member controls defined.

User Exit Name. The name of an optional function, written by an installation, to do additional validation on a member being promoted into a controlled library.

User Exit Type. Indicates whether the user exit is a command or a program.

User Set. A list of logon IDs for those people who are to be authorized to promote members, or to have access to particular library members or library controls. There can be more than one user set. Each user set in a project has its own name.

Version Number. A number assigned to a member by the library administrator and assigned by the program developer. The number can associate the member with a particular promotion hierarchy through the use of distribution tables.

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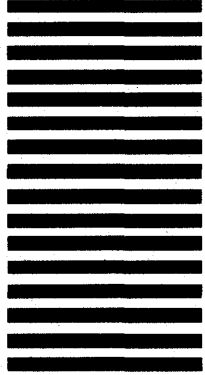
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