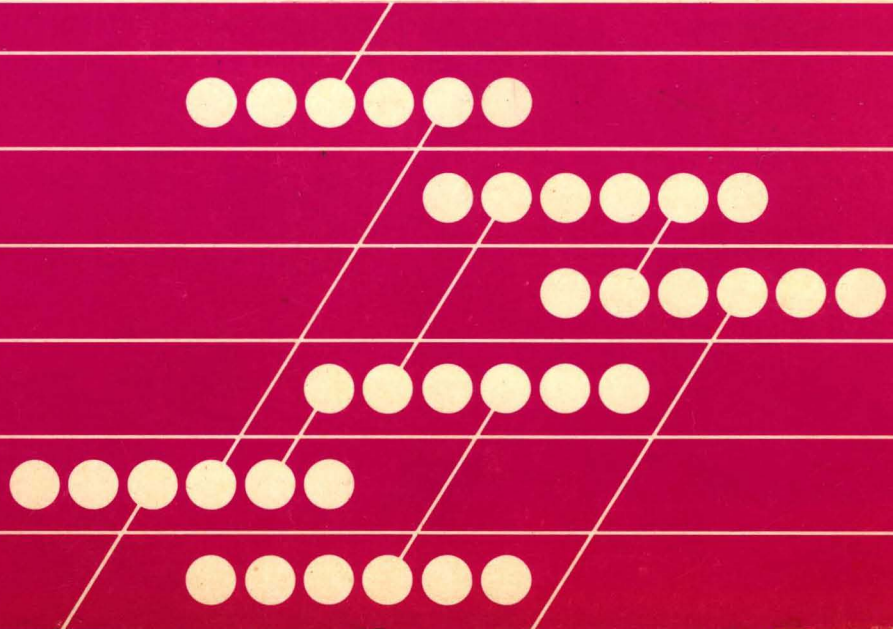


Interactive  
System Productivity Facility  
Version 2

What's New in ISPF?

MVS and VM/SP

**IBM**



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System Productivity Facility  
Version 2**

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**Publication Number  
GC34-2172-1**

**File Number  
S370/4300-39**

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**Program Numbers  
5664-282  
5664-285  
5665-317  
5665-319**

Second Edition (October, 1984)

This edition applies to the Interactive System Productivity Facility Program Product, Program Number 5664-282, and the Interactive System Productivity Facility/Program Development Facility Program Product, Program Number 5664-285, for use with VM/SP Release 3 with the Conversational Monitor System (CMS) and to all subsequent releases until otherwise indicated by Technical Newsletters.

This edition also applies to the Interactive System Productivity Facility Program Product, Program Number 5665-319, and the Interactive System Productivity Facility/Program Development Facility Program Product, Program Number 5665-317, for use with OS/VS2 MVS Release 3.8 with the Time Sharing Option (TSO) or MVS/SP Release 1.1.1 and to all subsequent releases until otherwise indicated by Technical Newsletters.

Changes are made periodically to the information herein; before using this publication in connection with the operation of IBM systems, consult the latest IBM System/370 and 4300 Processors Bibliography, GC20-0001, for the editions that are applicable and current.

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## PREFACE

The Interactive System Productivity Facility (ISPF) and the SPF/Program Development Facility (ISPF/PDF or PDF) are related IBM program products. Together, they are designed to improve user productivity in the development of applications, and contain special functions for the development and use of interactive applications, called dialogs. Specifically:

ISPF is a dialog manager for interactive applications. It provides control and services to permit execution of the dialogs in the MVS and VM/SP environments.

PDF is a facility that aids in the development of dialogs and other types of applications. It makes use of display terminals and an interactive environment to help with many programming tasks.

This manual provides information about the improvements and enhancements that have been made to the Interactive System Productivity Facility (ISPF), Program Numbers 5664-282 and 5665-319, and the ISPF Program Development Facility (ISPF/PDF), Program Numbers 5664-285 and 5665-317. These new features are contained in Version 2 of these program products for VM and MVS (Release 1 except where noted).

This manual is intended to be read by people who are familiar with Version 1 of ISPF and ISPF/PDF. To obtain information about Version 1, please see ISPF General Information, GC34-2078.

The manual covers the following topics:

- . **Introduction** lists all of the new and enhanced dialog management services.
- . **ISPF Dialog Management** describes the enhancements and improvements to the ISPF Program Product.
- . **Program Development for the End-user** describes the new and improved functions in ISPF/PDF that can be invoked by end-user applications in addition to being directly used by application developers.
- . **Program Development for the Application Developer** describes the other new features of ISPF/PDF that are normally used by application developers.

- . **ISPF and ISPF/PDF Version 2 Publications** describes new ISPF publications and the additions to previous publications. Where previous publications have new publication numbers, the change bars have been retained to facilitate the locating of new information.
- . **ISPF on the PC** describes two types of ISPF available for the PC.

The origin, purpose, and design of these products were documented by P. H. Joslin in the IBM Systems Journal, Volume 20, Number 4. A reprint is available, form number G321-5155. The origin, purpose, and design of the dialog test functions were documented by M. E. Maurer in the IBM Systems Journal, Volume 22, Number 3. A reprint is available, form number G321-5194.

The new and updated publications for ISPF and ISPF/PDF Version 2 are:

ISPF and ISPF/PDF:	VM/CMS	MVS/TSO
<u>General Information</u>	GC34-2181	GC34-2136
<u>Presentation Guide</u>	G320-6506	G320-6506
<u>What's New in ISPF</u>	GC34-2172	GC34-2172
<u>Installation and Customization</u>	SC34-2182	SC34-2143
<u>Diagnosis</u>	SC34-2183	SC34-2140
ISPF:		
<u>Dialog Management Services</u>	SC34-2173	SC34-2137
<u>Dialog Management Services Examples</u>	SC34-2174	SC34-2138
<u>Product Reference Card</u>	GC34-2169	GC34-2169
<u>Licensed Program Specification</u>	GC34-2175	GC34-2141

ISPF/PDF:

<u>Dialog Services</u>	SC34-2178	SC34-2134
<u>Edit Macros</u>	SC34-2179	SC34-2133
<u>Library Management</u>		SC34-2135
<u>Library Management Facility Presentation Guide</u>		G320-0740
<u>Program Reference</u>	SC34-2176	SC34-2139
<u>Licensed Program Specification</u>	GC34-2180	GC34-2142

These publications are described in Chapter 5.



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## CHAPTER 1. INTRODUCTION

Version 2 of ISPF includes 28 new dialog services to bring the total available to 66. Of the previous 38 dialog services, 15 have been enhanced. The new library access services (PDF) are:

Initializing Service	LMINIT	LMQUERY	LMFREE
Open and Close Services	LMOPEN	LMCLOSE	
Input/Output Services	LMGET	LMPUT	
Member Manipulation Services	LMMLIST	LMMFIND	LMMADD
	LMMDEL	LMMREN	LMMREP
Data Set Services	LMERASE	LMRENAME	
Library Control Service (MVS ISPF/PDF Release 1 and VM ISPF/PDF Release 2)	LMPROM		
Library Specification Services (VM only)	LMSPEC	LMUNSPEC	

The other new services are:

Library Definition Service (VM only)	LIBDEF		
Graphics Services	GRINIT	GRTERM	GRERROR
Message Service	GETMSG		
Panel Query Service	PQUERY		
Table Services	TBSORT	TBSTATS	
Edit Macro Service (PDF)	ISREDIT		
Edit Recovery Service (PDF)	EDREC		

| The 15 existing services enhanced are:

Program Development Facility	BROWSE	EDIT		
Display Services	DISPLAY	TBDISPL		
Table General Services	TBOPEN	TBCREATE		
Table Row Services	TBADD	TBGET	TBMOD	TBPUT
	TBSARG	TBSCAN	TBBOTTOM	TBSKIPP
Select Service	SELECT			

## CHAPTER 2. ISPF DIALOG MANAGEMENT

This chapter describes the new and improved functions in the ISPF Program Product that can be built into end-user applications that run under ISPF Version 2.

### VM ENVIRONMENT EXTENSIONS

Major enhancements have been made to ISPF under VM/CMS and are described below.

#### CMS REXX Interface

The VM/SP Release 3 interpreter language (REXX) can now be used for dialogs running under VM/CMS. Two REXX examples are included in the ISPF Dialog Management Services Examples manual.

#### CMS File Support

ISPF panels, messages, file tailoring skeletons, and tables are supported from CMS files, in addition to the existing MACLIB support.

#### CMS Library Definition Service

The LIBDEF service provides applications with a dynamic method of defining application data element files while in an active ISPF session. This eliminates the need for CMS FILEDEF commands to define application data element files prior to the invocation of ISPF.

The LIBDEF service may be used to define application panels, messages, tables, skeletons, file tailoring output, text module libraries, and load module libraries.

#### SELECT Service PASSLIB new keyword

PASSLIB - The current set of application-level ISPF libraries, if any exist, can be specified for use with the next application being selected when NEWAPPL is specified.

#### SELECT Service CMS new keyword

CMS keyword specifies that the selected program to receive parameter lists that are compatible with CMS.

### New PROFILE Pool Support

New PROFILE pool support allows an additional profile to be used as the source of read-only application profile data.

### CMS/DOS Support

CMS/DOS support allows ISPF to operate with CMS 'DOS' simulation active. User programs, EXECs and commands receive control with the 'DOS' option on if ISPF is invoked with the 'DOS' option on. The ISPF service interface (ISPEXEC, ISPEX, ISPLINK and ISPLNK) returns control with a 'DOS' option set in the same state as when the service request was made.

### Performance

The performance of ISPF initialization and termination has been improved. This has been accomplished by reducing the path lengths of initialization by 42% and termination by 63%.

The net effect of these changes was measured using a 3033 with resources that were not constrained. It was found that initialization response time was reduced by 22% and termination response time by 28%. The percent improvement will tend to increase in those environments that are process bound, and decrease in those that are I/O bound.

## **MVS ENVIRONMENT EXTENSIONS**

Some restrictions concerning the use of the MVS environment by ISPF dialogs have been removed and are described below.

### MVS/XA Support (Release 2)

ISPF and ISPF/PDF functions are supported in 31-bit addressing mode. This provides virtual storage constraint relief (VSCR) and allows growth of ISPF by using the extended address space of MVS/XA. The majority of the code is moved from the link pack area (LPA) to the extended LPA above the 16Mb line. Total downward compatibility with MVS/370 is maintained. If installed on MVS/XA, it can be shared with an MVS/370 system.

### Authorized TSO Command and Program Invocation

ISPF permits the invocation of authorized commands and programs in the MVS/TSO environment. Authorized commands and programs can be invoked wherever non-authorized commands and programs can be invoked.

## TSO Subtasking Support

The ISPLINK interface and CALL ISPEXEC interface may be invoked at any task level below the logical screen task. However, subtasking support applies only to dialogs that are selected through the use of the CMD parameter. There are no changes to the external interface.



## VM AND MVS INFORMATION

The remainder of this manual applies to VM/CMS and MVS/TSO except where noted.

### 3290 INFORMATION PANEL

The capability to address all screen positions on the 3290 terminal (16-bit addressing) is now provided.

Multiway split screen capability uses the SPLITV command to obtain a vertical split, in addition to horizontal splitting. The hardware partitioning mechanism is used to permit split screen on this terminal.

Extended highlighting and graphics use the same mechanisms as for 3279 terminals (see below).

### 3279 TERMINAL

Extended color, reverse video, blinking, and extended highlighting, at the field level in panel definitions, can be used on 3279 terminals.

Graphic support is available through an interface to GDDM.

## TERMINAL INTERFACE INFORMATION

Modification indication (MDT bits) for input fields within a dynamically formatted area can be returned to the dialog.

PF key assignment information can be returned to the dialog.

The physical and logical screen size (width and depth), scroll amount, and terminal type can be returned to the dialog.

## GDDM INTERFACE (GRINIT, GRTERM, AND GRERROR SERVICES)

The new GRINIT, GRTERM, and GRERROR services provide the capability for ISPF dialogs to display graphic images within the framework of the ISPF panel architecture.

A single "graphic area" can be specified within a panel. The necessary extensions to the panel syntax have been made within the )ATTR and )BODY section in order to support this function. A graphic area may contain either a picture, constructed via GDDM based services, or a graph, constructed via the non-interactive PGF (Presentation Graphics Feature) services. A new interface also allows ISPF screen snapshots to be written on GDDM supported printers.

The identity of the final line, within a GRAPHIC or DYNAMIC area, visible on a screen is available through use of the LVLIN built-in

function on an assignment statement in the )INIT, )REINIT, or )PROC sections.

A graphic area example dialog is included in the ISPF Dialog Management Services manuals.

## DYNAMIC SCREEN GENERATION

Dynamic screen generation provides a means for a dialog to format a portion (or all) of the panel dynamically. Support is made available for specifying a dynamic area within a panel, for specifying field attributes within the area, and for filling the area with data. On return from the display service, a means is made available of indicating which fields within the area have been modified.

A dynamic area example dialog is included in the ISPF Dialog Management Services manuals.

## ISPEXEC (ISPEX) PROGRAM INTERFACE

The ISPEXEC interface allows a program dialog to invoke dialog services by passing a character string that syntactically matches the ISPEXEC requirements. All services that can be requested through the use of ISPEXEC command procedure statements are valid through this type of call interface.

This interface can be used for programs written in COBOL, FORTRAN, PASCAL, and PL/I.

## PASCAL PROGRAM INTERFACE

Dialog applications may be written in PASCAL. The new ISPEXEC service can be used for invoking most of the dialog management services. The ISPLINK interface should be used for the remaining services.

The PASCAL models in ISPF/PDF will be helpful in developing PASCAL dialogs. Two PASCAL examples are included in the ISPF Dialog Management Services Examples manuals.

## APL INTERFACE

The main points of the APL2 support are:

APL2 functions can be selected from a panel, command table, or another dialog function. The SELECT implies the start-up of APL2, the loading of the designated work space, and the passing of control to the APL2 function in the work space.

An APL2 function executing within the ISPF environment can call on ISPF services by executing a monadic APL2 function which accepts a

character string containing the name of the service and all necessary parameters. The format is the same as passed via the ISPEXEC service by CLISTs).

The variables in the APL2 work space become function variables for ISPF. All rules for function variables apply to variables in the APL2 work space.

Two APL2 examples are included in the ISPF Dialog Management Services Examples manuals.

## SELECT SERVICE LANG(APL) NEW KEYWORD

For VM ISPF Release 1 and MVS ISPF Release 2, the LANG(APL) keyword is used to specify a function written in APL2.

## MESSAGES ENHANCEMENTS (GETMSG SERVICE)

The new GETMSG service allows the user to retrieve a message from the message library and place its text in dialog variables.

## GENERAL PANEL ENHANCEMENTS

New features that expand the capabilities of ISPF panels are described below.

### Obtain Panel Information (PQUERY Service)

The new PQUERY service returns information for a specified area on a panel. The type (DYNAMIC or GRAPHIC) and size characteristics associated with the panel are returned in variables.

### Additional Cursor Placement Capability

The DISPLAY service now has a new parameter, CSRPOS, that allows the programmer to specify the cursor position within the given cursor field.

CSRPOS can be used to return to the dialog, cursor information such as field name and position within the field.

### )REINIT Section

This new panel section allows the programmer to specify processing to occur before a panel is redisplayed.

### Refreshing of Field Values When Redisplaying

The REFRESH statement provides the capability for reassigning or refreshing the values of given fields on the screen at the time of a redisplay (when the contents of the screen are not rebuilt and the )INIT section is not reprocessed).

### COLOR(value) Attribute

The COLOR keyword defines the color of a field. The "value" may be: WHITE, RED, BLUE, GREEN, PINK, YELLOW, or TURQ (turquoise).

### HILITE(value) Attribute

The HILITE keyword defines the extended highlighting attribute for a field. The "value" may be: USCORE (underscore), BLINK (blinking), or REVERSE (reverse video).

### Attribute Override

The .ATTR and .ATTRCHAR control variables provide the capability to dynamically change attributes for a single field or those for an attribute character within the )INIT, )PROC, or )REINIT section through

an assignment statement.

#### Floating Command/Message Area

The programmer can now place the command and long message areas at the top or bottom of the panel as a user-definable option. This is controlled by setting the system variable ZPLACE or by Option 0.4 of ISPF or ISPF/PDF.

#### Expanded Panels ( )BODY WIDTH EXPAND)

Extensions to panel syntax provide the capability to expand panels to a width greater than 80 characters for larger terminals such as the 3290 terminal.

#### Alarm Control Variable

The audible alarm control variable .ALARM can now be set within an assignment statement in the panel definition. Setting this variable causes the alarm to be sounded when the panel is displayed without a message being required.

## MISCELLANEOUS PANEL ENHANCEMENTS

New features that provide greater flexibility in panel definition are described below.

### Easing of Syntax Rules and Restrictions

Syntax rules have been relaxed to allow all panel statements, variable names, keywords, and keyword values to be entered in either uppercase or lowercase.

### Extended Verification Function

Extends alphabetic verification (such as type of ALPHA or that within a picture specification) has been extended to recognize values entered in lowercase as well as uppercase.

### Extended Pad Character Specification

Control over the pad character specification and display now includes the capability to specify something other than N (for nulls) and B (blanks) as a general user-supplied padding character. In addition, the display of a trailing pad character can be suppressed when a panel field has an initial value.

### Easing of Field Length Limitation

The programmer can now define panel input/output fields of a length greater than 255 characters.

### Program Function Key Value Determination

The PFK (value) built-in function provides program function key assignment information by command or key number.

## PANEL UPDATE UTILITY (ISPPUP)

The panel update utility is enhanced to provide the following new functions:

Deletion of an existing option from a selection panel. A deletion is recognized by a keyword field that matches a current keyword on the panel, and a select string that is blank.

Replacement of an existing option in a selection panel with a new option. A replacement option is recognized by a keyword field that matches a current keyword on the panel, and a select string that is nonblank.

Generation of a sequential file that is used to record the changes that were made to panels and that may be used later to back out these changes.

Acceptance of either an ISPF table (as is currently done in ISPF Version 1 Release 1) or the above sequential file as input to control the the update process.

## FILE TAILORING

The file tailoring facility of ISPF is extended to permit output records sizes of other than 80 characters. This support is provided for all sequential data sets for which the logical record size (LRECL) does not exceed 255 bytes. Both fixed and variable length records are supported. In addition, the capability is provided to insert one or more blank lines in an output file. The number of tab stops is increased to 16 (from 8).

## TABLE SERVICES

The new table service functions include two new services, TBSORT and TBSTATS, and improvements to TBDISPL, TBCREATE, TBOPEN, TBADD, TBGET, TBMOD, TBPOT, TBSARG, TBSCAN, TBBOTTOM, TBSKIP. These new services and improvements to existing services are described below.

### TBSORT Service

The new TBSORT service provides the capability to sort a table. Rows added or revised may be inserted or moved, automatically, in the table to maintain the table in a predefined sequence.

### TBSTATS Service

The new TBSTATS service is provided to retain status information regarding the contents and usage of a table.

### TBCREATE and TBOPEN LIBRARY Parameter

A LIBRARY parameter on the TBCREATE and TBOPEN services allows the dialog to specify an optional input source for the table.

### TBCREATE and TBOPEN SHARE Parameter

A SHARE parameter on the TBCREATE and TBOPEN services allows a table to be shared between logical screens.

### TBADD, TBMOD, and TBPOT ORDER Parameter

An ORDER parameter on the TBADD, TBMOD, and TBPOT services specifies that the new row is to be added to the table in the order specified in the sort information record. A TBSORT must have been performed for the table prior to the use of ORDER.

### TBBOTTOM, TBGET, TBSCAN, and TBSKIP ROWID Parameter

A ROWID parameter is provided on the TBBOTTOM, TBGET, TBSCAN, and TBSKIP services to return a row-identifier. This row-identifier can then be specified in a ROW parameter on TBSKIP to cause positioning to the row without regard to the row's relative position in the table.

### TBBOTTOM, TBGET, TBSCAN, and TBSKIP NOREAD Parameter

A NOREAD parameter has been added to these dialog services. The CRP is moved to the selected row but no data is transferred to the variables in the function pool.



## TBBOTTOM, TBGET, TBSCAN, and TBSKIP POSITION Parameter

A POSITION parameter has been added to these dialog services. The POSITION parameter returns the current row pointer (CRP) value at the completion of the service.

## TBSARG and TBSCAN Services

The TBSARG and TBSCAN services are extended to allow for the specification of a search "direction" and a "logical-relationship" between the argument and row data that should terminate the scan.

## TABLE DISPLAY SERVICE

The Table Display service is enhanced to remove some of the current restrictions on table display panels, so that they may include statements and attributes available on other types of panels. The new capabilities are summarized below.

### Attributes

Any attributes may be associated with any field, including fields within the model line(s).

### Input/Output Fields

Any number of input/output fields may be included within the panel body. Alternate command/message fields may be defined within the non-scrollable portion of the panel.

### )PROC and )REINIT Sections

A )PROC or )REINIT section (or both) may be included.

If a )PROC section is included, it will be processed each time TBDISPL is called, regardless of whether the panel name is specified. It will also be processed for a redisplay that occurs as a result of verification failure.

If a )REINIT section is included, it will be processed each time TBDISPL is invoked without the panel name. This holds true for a request to redisplay the table panel with a message or a request to process the next selection. The )REINIT section will also be processed for a redisplay that occurs as a result of verification failure.

## Control Variables

Any of the control variables may be assigned within the various sections.

### .CSRROW Control Variable

A new table display control variable, .CSRROW, may also be set in the )INIT or )REINIT section to indicate a particular row where the cursor is to be placed. The rules that apply are the same as those for setting the row through the CSRROW parameter of the TBDISPL service.

### Additional Parameters

The TBDISPL service has additional parameters for cursor positioning within a field (CRSPOS), auto-selection (AUTOSEL), storing the row number pointed to by the current row pointer (POSITION), and storing the number of the row being accessed (ROWID).

### Variable Model Lines

Variable model lines may be specified in the panel definition. If a variable (that is, a name preceded by an ampersand) begins in column 1 of any model line, the value of that variable defines the model line.

Changing the variable during program execution provides a way to simulate horizontal table display scrolling with a single panel definition.

### Table Handling Examples

Three additional table handling examples are included in the ISPF Dialog Management Services Examples manuals.



## CHAPTER 3. ISPF/PDF FUNCTIONS FOR THE END-USER

This chapter describes the new functions for applications using the services of ISPF/PDF Version 2 or for developers using ISPF/PDF Version 2.

### XEDIT (VM ONLY)

An interface to XEDIT gives users a choice between XEDIT and PDF editor. To specify XEDIT as the editor for your edit session, enter "XEDIT" in the EDITOR field on the edit entry panel. XEDIT under ISPF/PDF works exactly like XEDIT under CMS.

#### XEDIT Options (VM only)

If you specify XEDIT and enter "yes" in the XEDIT options field, a panel is displayed to allow you to specify the XEDIT options. The XEDIT options panel allows you to list any of the XEDIT options. These options are remembered from session to session.

#### XEDIT File Types (VM only)

XEDIT under PDF allows you to edit all types of files that are supported in XEDIT under CMS. PDF editor restrictions on record length of the file being edited are not applicable when you use XEDIT under PDF; only XEDIT restrictions apply.

You can XEDIT CMS sequential files, a member of a CMS MACLIB or TXTLIB, a member of an ISPF library, or a member of a concatenated sequence of ISPF libraries. If you specify XEDIT for a CMS MACLIB, a TXTLIB, or an ISPF library without specifying a member name, a member list is displayed from which you can select the desired member.

If the member is found in an ISPF library that is not first in the concatenation sequence, has a logical record length greater than 80, and is to be copied into a primary ISPF library defined as MACLIB or TXTLIB, a truncation warning panel is displayed.

If the member to be XEDITed is in a CMS MACLIB or TXTLIB, or the primary ISPF library is specified as MACLIB or TXTLIB, the member is copied into a temporary file. The temporary file id is as follows:

The filename is the name of the specified member.

If the member is to be saved in a MACLIB, the filetype is MACRO. If the assigned file id exists, the filetype is changed to COPY.

If the member is to be saved in a TXTLIB, the filetype is TEXT. If the assigned file id exists, a warning panel is displayed.

If the return code from XEDIT is zero and the temporary file still exists, it is copied back to the originating MACLIB or TXTLIB. If the record length of the temporary file is inconsistent with the origination library, a truncation warning panel is displayed.

## DISPLAY COMMAND WITHIN BROWSE

The user can display carriage control characters and non-displayable character positions.

## RECURSIVE EDIT/BROWSE INVOCATION

Edit recovery has been improved to permit the user to invoke an EDIT command (when in edit) or a BROWSE command (when in browse). Effectively, the previous data set or member is "pushed down" in a stack until the current edit or browse is ended.

## EDIT/BROWSE USER-DEFINED PANEL

A dialog may use a customized panel to display other fields that are meaningful to the user. In this way, each dialog can display data unique to it.

## EDIT RECOVERY (EDREC SERVICE)

The new EDREC service allows a dialog to initialize an edit recovery table, determine whether recovery is pending, and take the action specified by the the first argument.

Edit backup and recovery is controlled by an edit recovery table that determines the number of recursion levels allowed. An installation may modify this table to increase or decrease the number of entries.

The edit recovery panel now has a DEFER option to defer recovery of the specified data set.

## EDIT MACROS (ISREDIT SERVICE)

The editor has been extended to process macros. A macro can be executed by entering the macro name in the command area similar to an edit primary command. Macros can override built-in commands. An "initial" macro can be invoked, using the IMACRO command, the PROFILE IMACRO option, or the EDIT service MACRO option, to perform tasks prior to or instead of displaying the edited data on the user's screen.

Other options extend edit with macro commands; invoke any dialog

management service; and allow macros to access external data, edit modes, and other related information including the mask line, tabs line, and bounds. Edit macros may be written in a programming language such as COBOL, FORTRAN, PASCAL, or PL/I or a command language such as VM/SP REXX or EXEC2 or MVS/TSO CLIST. The ISREDIT service provides a means for ISPF/PDF edit macros to issue PDF edit macro commands and assignment statements.

## EDIT LABELS

Labels can be assigned to lines by overtyping the line number. The label starts with a period (".") followed by one to five alphabetic characters, the first character of which must not be a "Z". The commands on which a label can be specified are:

COPY LOCATE MODEL MOVE RESET

The commands on which a range, that is, two labels, can be specified are:

CHANGE CREATE DELETE EXCLUDE FIND LOCATE REPLACE RESET  
SORT SUBMIT

## EXTENDED MOVE/COPY MEMBER LIST WITHIN EDIT

While under Edit, you can copy or move another data set into the current data set. If you do not specify the member name on the extended move/copy panel, a member list is displayed.

## EDIT COMMANDS CAN BE PREFIXED WITH AN AMPERSAND (&)

An edit command prefixed with an ampersand remains displayed on the command line after it has been executed. This technique speeds the entry of similar commands by removing the need to reenter the entire command.

## CHANGE COMMAND WITHIN EDIT

The 'change to' string may now be a picture string.

Example of CHANGE command:

```
CHG ALL P=' P'>
```

changes all characters to uppercase.

## **BOUNDS COMMAND WITHIN EDIT**

The BOUNDS command sets the left and right boundaries and saves them in the edit profile. It provides an alternative to setting the boundaries with the BOUNDS line command.

## **DELETE COMMAND WITHIN EDIT**

This new primary command is similar to the DELETE (D) line command, but has ALL X, ALL NX, and range options. ALL X indicates that only excluded lines are to be deleted. ALL NX indicates that only non-excluded lines are to be deleted. Range indicates two labels that define the first and last lines to be examined for excluded or non-excluded lines (or both).

## **EXCLUDE COMMAND WITHIN EDIT**

This new primary command is similar to the EXCLUDE (X) line command, but has the same options as a FIND command.

## **LEVEL COMMAND WITHIN EDIT**

The user can control the modification level that is assigned to a member of an ISPF library.

## **LOCATE COMMAND OPTION WITHIN EDIT**

This command is used to search for a line with a pending line command.

## **AUTOSAVE COMMAND WITH PROMPT OPTION WITHIN EDIT**

The user can control the meaning of the END command when terminating edit. AUTOSAVE OFF with NOPROMPT is the same as CANCEL.

## **PROFILE LOCK OPTION WITHIN EDIT**

Specifying PROFILE LOCK allows the changes to the user's edit profile to be treated as read-only: that is, the changes made during a session are not stored in the permanent edit profile. Specifying the NOLOCK operand causes all changes to be stored, as in previous releases.

## **PROFILE NOTE AND MODEL NOTE OPTIONS WITHIN EDIT**

The user can control the displaying of tutorial notes when the MODEL command is used. As a user's experience increases, the tutorial information is required less when a model is displayed.

## PROFILE PACK OPTION WITHIN EDIT

The members of ISPF libraries may coexist in packed or unpacked format. The current state of a member may be changed (for example, from packed to unpacked) when using Edit, Move/Copy, or the MVS ISPF/PDF Release 1 and VM ISPF/PDF Release 2 Library Management Utilities.

## RESET OPTIONS WITHIN EDIT

The effect of the RESET command can now be limited as described below.

LABEL (or LAB) indicates that labels should be cleared (undefined).

COMMAND (or COM) indicates that pending line commands should be cleared.

ERROR (or ERR) indicates that error flags (==ERR>) should be cleared.

CHANGE (or CHG) indicates that change flags (==CHG>) should be reset.

SPECIAL (or SPE) indicates that special lines (flagged with (=PROF>, =MASK>, =TABS>, =BNDS>, or =NOTE= ) should be deleted.

EXCLUDE (or X) indicates that excluded lines should be reset (set non-excluded).

Range specifies two labels. The labels identify the first and last lines of a range of lines. The reset operation is limited to this range of lines. Range can be coded with any other operand on the RESET command.

## SORT COMMAND WITHIN EDIT

Within PDF edit, the SORT command permits a reordering of data within the member in ascending or descending order using up to five separate sort fields.

## VERSION COMMAND WITHIN EDIT

The user can change the version number of the member without affecting the modification number.

## DATA ACCESS

Access to data is improved as described below.

### SCROLL DATA Option

The DATA or D option provide scrolling 1 line or 1 column less than the currently visible data (PAGE - 1).



## Library and Data Set Names

Library and data set names can now start with '\$', '#', or '@'.

## LIBRARY ACCESS SERVICES

The library access services provide an interface to ISPF libraries and to certain other system data sets. With a few exceptions, the library access services are system-independent and may be used by any ISPF dialog.

The library access services can be invoked by a program function through a CALL to ISPEXEC, ISPEX, ISPLINK or ISPLNK, or by a command function dialog (EXEC2, REXX or CLIST) through the ISPEXEC interface.

The library access services may be used with the following types of data sets:

An ISPF library known by project, group, and type

A concatenated set of ISPF libraries

A single, existing partitioned or sequential data set or a preallocated VIO data set.

The data sets must have record types F, FB, V, VB, or U, and reside on a single DASD volume.

The following 18 services are available:

LMCLOSE	Closes a data set.
LMERASE	Deletes an ISPF library or MVS data set with a 3-level qualified data set name.
LMFREE	Releases the data set associated with a given data id.
LMGET	Reads one record of a data set.
LMINIT	Associates one or more ISPF libraries or an existing data set with a data id. Thereafter, this data id is used to identify the data set for processing by other library access services.
LMMADD	Adds a member to an ISPF library or a partitioned data set.
LMMDEL	Deletes a member of an ISPF library or a partitioned data set.
LMMFIND	Finds a member of an ISPF library or a partitioned data set and optionally locks the member.
LMMLIST	Creates a member list of an ISPF library or a partitioned data set.

LMMREN	Renames a member of an ISPF library or a partitioned data set.
LMMREP	Replaces a member of an ISPF library or a partitioned data set.
LMOPEN	Opens a data set.
LMPROM	(MVS ISPF/PDF Release 1 and VM ISPF/PDF Release 2) Promotes a member or a sequential data set to a controlled ISPF library.
LMPUT	Writes one record of a data set.
LMQUERY	Provides requested information regarding the data set associated with a given data id.
LMRENAME	Renames an ISPF library.
LMSPEC	(VM only) Specifies an ISPF library
LMUNSPEC	(VM only) Unspecifies an ISPF library



## CHAPTER 4. ISPF/PDF FUNCTIONS FOR THE APPLICATION DEVELOPER

This chapter describes the other new functions that will be useful to application developers using ISPF/PDF Version 2.

### PANEL AND MENU CONVERSION

All ISPF/PDF old-style panels and messages are converted to the new more versatile panel and message format. The convert utility (Option 3.10) to allow conversion of other old panels and messages to the new format is still included in ISPF/PDF.

### SPECIFY SCREEN DISPLAY CHARACTERISTICS (OPTION 0.4)

When this option is selected, a panel is displayed that allows the user to specify PLACEMENT=ASIS or PLACEMENT= BOTTOM for the command line and long message line.

### SPECIFY LIST DATA SET CHARACTERISTICS (OPTION 0.5)

When this option is selected, a panel is displayed that allows the user to specify the characteristics of the records to be contained in the list data set when it is allocated.

### CONCATENATION OF LIBRARIES FOR BROWSE (OPTION 1)

For added flexibility when searching for a member, Browse allows up to four libraries to be concatenated.

### PASCAL, REFRESH, AND ATTRIBA MODELS FOR EDIT (OPTION 2)

PASCAL is now available on the Model Class selection panel. REFRESH and ATTRIBA are now available in the Statements section of the Panel Models selection panel.

### LIBRARY UTILITY (OPTION 3.1)

Options S (MVS only) and I are available to display data set information (short) or display data set information.

## DATA SET UTILITY (OPTION 3.2) (MVS ONLY)

Option S is available to display data set information (short).

The Allocate New Data Set option has a GENERIC UNIT parameter.

The Data Set Information option shows the expiration date.

## MOVE/COPY UTILITY (OPTION 3.3)

For MVS ISPF/PDF Release 1 and VM ISPF/PDF Release 2, in addition to the Move and Copy options, this utility has option P to Promote Data Set or Member(s) and option PP to Promote and Print. The promotion panel has the following parameters:

ACTION	(MOVE - Move source into controlled library UNLOCK - Reset controls - delete source)
REASON CODE	records the purpose for the promotion in the activity log.
PACK DATA	specifies whether to store the promoted data in packed format.

## FILE LIST UTILITY (OPTION 3.4) (VM ONLY)

The "blank" (Display List) option produces a scrollable list of ISPF libraries or CMS files from which the user may select items for processing. These functions are initiated from the File List panel as follows:

B - Browse a library of file	P - Print a library or file
E - Edit or XEDIT a library or file	X - Print library or file index
D - Delete a library or file	M - Display member list
R - Rename a library or file	Z - Compress a library or CMS
I - Library or file information	MACLIB
U - Unspecify an ISPF library	

The commands available when displaying the data set list are:

SORT	to sort the list
LOCATE	to scroll the list
CONFIRM	to control display of the delete data set confirmation panel.

## DATA SET LIST UTILITY (OPTION 3.4) (MVS ONLY)

The "blank" (Display data set list) option produces a QUICK, SHORT, or LONG form scrollable list of data sets from which the user may select items for processing. These functions are initiated from the Data Set List panel as follows:

B - Browse data set	C - Catalog data set
---------------------	----------------------

E - Edit data set	U - Uncatalog data set
D - Delete entire data set	P - Print entire data set
R - Rename entire data set	X - Print index listing
I - Data set information	M - Display member list
S - Data set information (short)	Z - Compress data set

The commands available when displaying the data set list are:

SORT	to sort the list
LOCATE	to scroll the list
CONFIRM	to control display of the delete data set confirmation panel.

### RESET STATISTICS UTILITY (OPTION 3.5)

RESET MOD LEVEL can be used to reset the modification level to zero.

### FOREGROUND MEMBER EXPANSION FUNCTION (OPTIONS 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, AND 4.9)

Program source data or SCRIPT data can be stored in packed format by edit or move/copy. The data is unpacked before processing and any included members are also unpacked at the line where the COPY, INCLUDE, or IM statement is found.

### VS FORTRAN (OPTIONS 4.3 AND 5.3)

The VS FORTRAN compiler is invoked in place of the FORTRAN G1 compiler for both foreground and batch processing in all environments.

### VS FORTRAN INTERACTIVE DEBUG (OPTION 4.11)

For VM ISPF/PDF Release 1 and MVS ISPF/PDF Release 2 VS FORTRAN Interactive Debug is invoked in place of FORTRAN Interactive Debug.

### MEMBER PARTS LIST (OPTIONS 4.12 AND 5.12)

This cross reference facility shows, for each source program module specified:

The names of the modules it calls or includes.

The name of the modules that call or include it.

The languages permitted are the same as in the member expansion function. The VM Member Parts List options are:

- 1 - Browse member parts (foreground only)
- 2 - Print member parts (background only)

- 3 - Write member parts file

The MVS Member Parts List options are:

- 1 - Print member parts
- 2 - Write member parts data set
- 3 - Browse member parts (foreground only)

## DIALOG TEST FUNCTIONS (OPTION 7.1) LANG(APL) OPTION

For VM ISPF/PDF Release 1 and MVS ISPF/PDF Release 2, the Invoke Dialog Function/Selection Menu has the following new option:

Under the heading INVOKE COMMAND:

LANG(APL)

The LANG(APL) keyword is used to specify a function written in APL2.

## DIALOG TEST FUNCTIONS (OPTION 7.1) (VM ONLY)

The Invoke Dialog Function/Selection Menu has the following new options:

Under the heading INVOKE COMMAND:

CMD - The name of a command procedure (EXEC2 or REXX)

Under the heading INVOKE PROGRAM:

EXTENDED PLIST support allows a selected program to receive a CMS style set of parameter lists.

You can also specify:

PASSLIB - The current set of application-level ISPF libraries, if any exist, can be specified for use with the next application being selected when NEWAPPL is specified.

## DIALOG TEST DISPLAY PANELS (OPTION 7.2)

CURSOR POSITION can be used to specify the position in the field where the cursor is to be placed.

## LIBRARY MANAGEMENT UTILITIES (OPTIONS 8.1 THROUGH 8.T)

For MVS ISPF/PDF Release 1 and VM ISPF/PDF Release 2, this facility gives the user precise control over his development library. Members of a controlled library can be updated only if the user is authorized by the system. Libraries can be activated and deactivated selectively and can be related by predefining a hierarchical structure.

#### CONTROLS (Option 8.1)

Option 8.1 specifies library attributes to create, update, or delete promotion hierarchies, authorizes access to controls or members in hierarchies, or specifies action taken when promoting members.

#### USER SET (Option 8.2)

Option 8.2 creates, updates, or deletes the list of users authorized to perform library functions.

#### DISTRIBUTION (Option 8.3)

Option 8.3 creates, updates, or deletes a distribution table to relate different promotion hierarchies.

#### ACTIVATE (Option 8.4)

Option 8.4 activates or deactivates promotion hierarchy controls.

#### REVIEW (Option 8.5)

Option 8.5 controls browse or print activity and display of library controls information.

#### TUTORIAL (Option 8.T)

Option 8.T provides general information about the library management utilities.





## CHAPTER 5. ISPF AND ISPF/PDF VERSION 2 PUBLICATIONS

New publications are available for Version 2. Where these replace previous versions of documents with the same title, the change bars have been retained to help you to find the new information.

Where two numbers are shown the first number is for VM and the second number is for MVS.

### ISPF AND ISPF/PDF GENERAL INFORMATION, GC34-2181 AND GC34-2136

ISPF and ISPF/PDF General Information now contains a summary chapter covering the Testing Period, License, Program Services, Warranty, and Availability.

### ISPF AND ISPF/PDF PRESENTATION GUIDE, G320-6506

ISPF and ISPF/PDF Presentation Guide has been updated by technical newsletters containing the same information as in this manual. The script and foils form can be used for presenting ISPF Version 2.

### ISPF AND ISPF/PDF INSTALLATION AND CUSTOMIZATION, SC34-2182 AND SC34-2143

ISPF and ISPF/PDF Installation and Customization now contains appendixes for System Generation, Library Management Facility SVC and Address Space, and Customization of Edit and Browse Panels.

### ISPF AND ISPF/PDF DIAGNOSIS, SC34-2183 AND SC34-2140

ISPF and ISPF/PDF Diagnosis provides technical information to aid in the evaluation of problems related to ISPF and ISPF/PDF. It is intended to be used by persons responsible for diagnosing and resolving problems.

### ISPF DIALOG MANAGEMENT SERVICES, SC34-2173 AND SC34-2137

ISPF Dialog Management Services now contains two appendixes for Using the TBDISPL Service and appendixes for a Dynamic Area Example Dialog and a Graphic Area Example Dialog.

### ISPF DIALOG MANAGEMENT SERVICES EXAMPLES, SC34-2174 AND SC34-2138

ISPF Dialog Management Services Examples now contains two PASCAL examples, two REXX examples, two APL2 examples, and three additional

table handling CLIST examples.

#### **ISPF PRODUCT REFERENCE CARD, GC34-2169**

ISPF Product Reference Card lists IBM Program Products, Program Offerings, Marketing Offerings, and Installation Productivity Offerings that use ISPF. An updated edition is now available.

#### **ISPF LICENSED PROGRAM SPECIFICATIONS, GC34-2175 AND GC34-2141**

ISPF Licensed Program Specifications summarize the functions of the ISPF Program Products, Program Numbers 5664-282 and 5665-319, and describe the operating environments, the system requirements, and the warranties.

#### **ISPF/PDF DIALOG SERVICES, SC34-2178 AND SC34-2134**

ISPF/PDF Dialog Services provides a detailed description of the dialog management services that are available in ISPF/PDF and can be used by ISPF dialogs. Previously these services were described in ISPF Dialog Management Services.

#### **ISPF/PDF EDIT MACROS MANUAL, SC34-2179 AND SC34-2133**

ISPF/PDF Edit Macros describes how to extend Edit capabilities with macros written in high-level languages or command languages. These macros can invoke any dialog management service.

#### **MVS ISPF/PDF LIBRARY MANAGEMENT, SC34-2135**

ISPF/PDF Library Management provides information on how to create the library controls available with library management, and how the controlled libraries are used in the development process.

#### **MVS ISPF/PDF LIBRARY MANAGEMENT PRESENTATION GUIDE, G320-0740**

ISPF/PDF Library Management Presentation Guide explains the rationale, objectives, concepts and terminology, library use and library definition encountered in using the Library Management Facility. The presentation assumes the audience is familiar with the basic concepts of ISPF and ISPF/PDF.

#### **ISPF/PDF REFERENCE, SC34-2176 AND SC34-2139**

ISPF/PDF for MVS Program Reference now contains a chapter for Library Management Utilities (Option 8).

## ISPF/PDF LICENSED PROGRAM SPECIFICATIONS, GC34-2180 AND GC34-2142

ISPF/PDF Licensed Program Specifications summarize the functions of the ISPF/PDF Program Products, Program Numbers 5664-285 and 5665-317, and describe the operating environments, the system requirements, and the warranties.



## CHAPTER 6. ISPF ON THE PC

Now, you can extend the power and productivity of a dialog manager to the Personal Computer with the Interactive System Productivity Facility for the Personal Computer.

ISPF/PC is a functionally similar product to the host version of ISPF, but is for the IBM Personal Computer.

### EZ-VU PUBLICATIONS

EZ-VU Presentation Guide, GC34-2167 and EZ-VU Information brochure, GC34-4001 are available.

### EZ-VU COMPONENTS

ISPF/PC consists of two parts: the EZ-VU Development Facility and the EZ-VU Runtime Facility. The Runtime Facility is required to execute dialogs developed using the Development Facility. The EZ-VU Development Facility part number is 6410980 and the EZ-VU Runtime Facility is 6316969.

The EZ-VU Development Facility provides a set of interactive facilities that permit a user to define and modify screens (called panels) interactively, and to display previously defined panels. The major components of the Development Facility are the Screen Definition Facility (SDF), the Screen Development Utility, and the Language Interface Modules.

### EZ-VU SCREEN DEFINITION FACILITY

A program typically takes input, processes it, and produces output. The SDF and the Runtime Facility can simplify the collection of input and the display of output. SDF gives you the ability to easily build the panels or screens to be used in the input/output process.

The information on these panels can be text, areas that will accept input or show output, patterns of lines, or even colors. Sixteen foreground and eight background colors are supported. Field level help and field level messages are available. These full-screen panels can make a program friendly, visually appealing, easy to learn, and easy to use.

There is no coding language involved or any commands to be typed to define these panels. SDF allows you to create or modify panels directly on your screen. As a result, you see the effects of any changes you make when you make them.

## EZ-VU WYSIWYG Editor

WYSIWYG stands for what-you-see-is-what-you-get. This means that wherever or whatever you type on the screen during panel definition is exactly what you see during panel execution. The developer is able to see how a panel looks while designing it.

## EZ-VU SCREEN DEVELOPMENT UTILITY

The panels created by SDF are maintained on your diskette in a compressed and encoded form to conserve space. However, when developing a dialog, it is often convenient to obtain a hard copy listing of a panel. The Screen Development Utility (SDU) allows you to obtain a complete listing of the panel. This listing contains an image of the panel, plus a description of all fields defined on the panel. The field description shows the location of each field, its size, name, and any field attributes assigned to each field.

## EZ-VU LANGUAGE INTERFACE MODULES

The IBM PC languages supported are COBOL, FORTRAN, BASIC, PASCAL, and ASSEMBLER. The Development Facility provides the software interface for each language.

## PC XT/370 ISPF

EZ-VU makes use of many PC hardware features that are not available on System/370. EZ-VU is functionally similar to host ISPF but not compatible. If compatibility is required the PC XT/370 should be used. VM/CMS Version 1 of ISPF (5668-960) and ISPF/PDF (5664-172) are available for the PC XT/370. Applications can be developed and maintained on a PC XT/370 and run in production on a System/370.

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ISPF Version 2: What's New in ISPF?

Printed in U.S.A.

GC34-2172-1



Publication Number  
GC34-2172-1

File Number  
S370/4300-39

Program Numbers  
5664-282  
5664-285  
5665-317  
5665-319

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