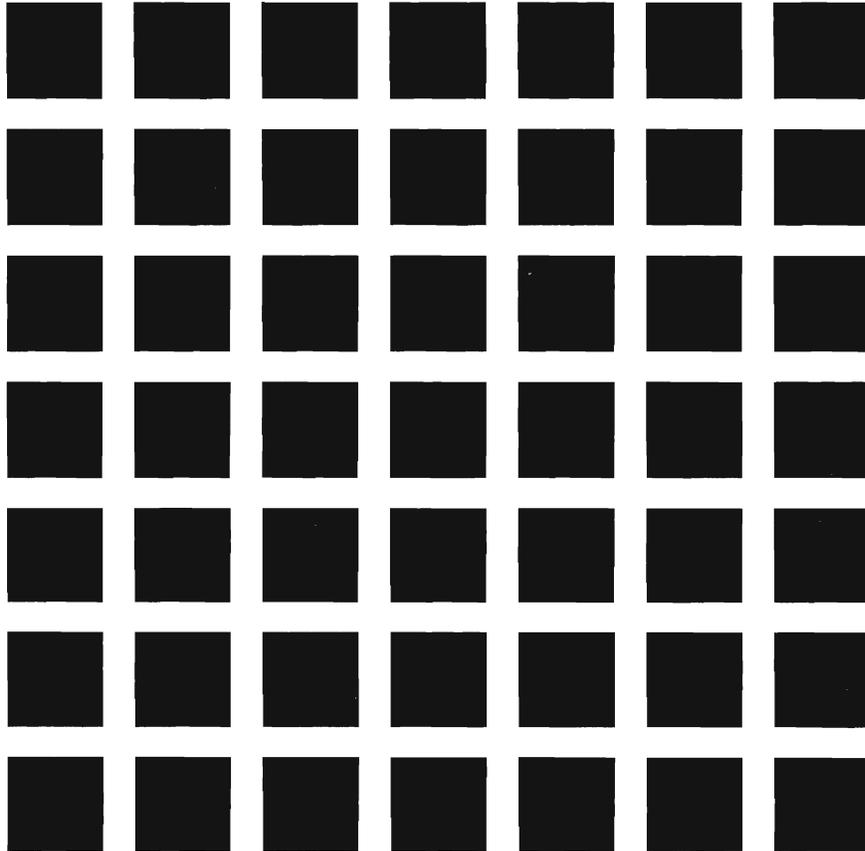


Working with Interactive System Productivity Facility (ISPF) and ISPF/Program Development Facility

VM/Integrated System
Release 5

SC34-4016-0



IBM

First Edition (June 1987)

This edition applies to Version 2, Release 2, of the program products Interactive System Productivity Facility (ISPF) (5664-282) and Interactive System Productivity Facility/Program Development Facility (ISPF/PDF) (5664-285), and to all subsequent releases and modifications of both until otherwise indicated in new editions or Technical Newsletters. They are for use with VM/SP Release 3. With Double-Byte Character Support (DBCS), they are for use with VM/SP Release 4.

This edition is a duplicate copy of the Interactive System Productivity Facility (ISPF) and ISPF/Program Development Facility (PDF) VM Version 2 Release 2 Primer (SC34-4017-0). However, some minor technical and editorial changes have been made to this edition.

Changes are made periodically to the information herein. Therefore, before using this publication, consult the latest IBM System/370 and 4300 Processors Bibliography (GC20-0001) for the editions that are applicable and current.

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About this book

The *ISPF and ISPF/PDF Primer* introduces you to ISPF and ISPF/PDF. These two products work together to help you manage and develop interactive applications (or **dialogs**, as ISPF calls them). The *Primer* shows you how to develop and test each element of an ISPF dialog, and how they all work together. You can re-create the sample dialog we use in this book to get some practice, or you can use it as a guide to design an application you are working on.

We've written the *Primer* for applications programmers who are familiar with VM/SP and CMS. If you're also familiar with either of VM/SP's command procedure languages, REXX or EXEC 2, that's a plus. If you aren't, you can do your coding in any of the high-level programming languages that ISPF supports.

Because this is an introductory book, we won't be discussing all of the ISPF services and ISPF/PDF options in detail. We'll be working only with those few services and options that you need to actually create a workable dialog. In fact, that's one reason why we think you'll like ISPF and ISPF/PDF — once you learn how to use a few basic features, you can start writing dialogs. (If you don't have access to ISPF/PDF, you can use XEDIT to work on the sample dialog).

After you're finished with the *Primer*, you can learn more about ISPF and ISPF/PDF from some of the other books in the product library. For detailed how-to and reference information, refer to:

ISPF Version 2 for VM/SP Dialog Management Guide, SC34-4009

ISPF Version 2 for VM/SP Dialog Management Services and Examples, SC34-4010

ISPF/PDF Version 2 for VM/SP Guide, SC34-4011

ISPF/PDF Version 2 for VM/SP Services, SC34-4012

Other books you might want to look at are:

VM/SP Interpreter User's Guide, SC24-5238

VM/SP Interpreter Reference, SC24-5239

VM/SP EXEC 2 Reference, SC24-5219

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Part One: Learning the Basics

Part One of the *Primer* gives you some general information about ISPF and ISPF/PDF, and introduces some terminology that's used in the ISPF and ISPF/PDF environments. It discusses some ISPF services, and summarizes the ISPF/PDF options. And you get some practice using each product.

Chapter 1. Introducing ISPF

This chapter tells you:

- What a dialog is
- What a dialog manager is, and what it does
- What ISPF services are
- How to invoke ISPF
- How to use the ISPF Sample Application.

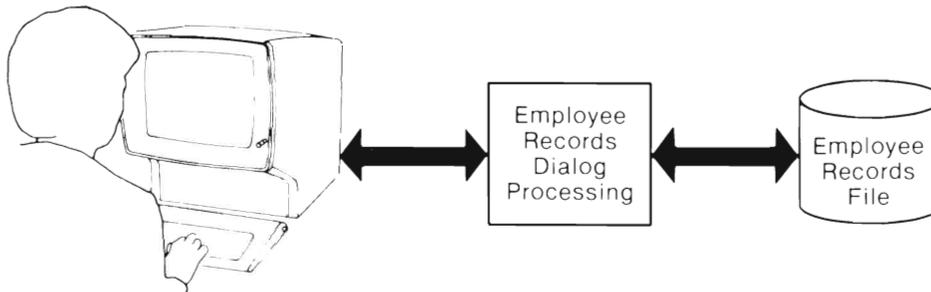
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What is ISPF?

ISPF is a **dialog manager**. Before we talk about what a dialog manager does, let's find out what a dialog is.

What is a dialog?

A **dialog** is a "conversation" between a person using an interactive display terminal and a computer executing a program for a particular application. For example, you might develop a dialog to help the Personnel Department update employee records.



ISPF dialogs are made up of **dialog elements**. Some elements must appear in every dialog. Other elements are optional — they are used only for certain types of applications or certain kinds of processing. This chart gives you some information about each one.

Dialog Element	Description
Function	<p>Functions direct the dialog's processing sequence. For example, they invoke ISPF services, and build and maintain tables. They can be written as:</p> <ul style="list-style-type: none">● command procedures<ul style="list-style-type: none">– REXX– EXEC 2● programs<ul style="list-style-type: none">– FORTRAN– COBOL– PL/I– Pascal– APL2
Panel Definition	<p>An ISPF dialog can use several kinds of panel definitions.</p> <ul style="list-style-type: none">● Selection panels display a list of processing options from which you can choose.● Data entry panels allow you to enter information to be processed by the dialog.● Table display panels show you the data stored in a table.● Information-only panels give you information about dialog processing, or provide help.

Dialog Element	Description
Message Definition	ISPF's messages relay information about processing, and call attention to input errors.
Table	Tables are two-dimensional arrays that store dialog data. They can be for temporary use, or they can be stored for use in future ISPF sessions. Not all dialogs use tables — it depends on the application's requirements.
File tailoring skeleton	Some ISPF dialogs use file skeletons to produce output. File skeletons work like a fill-in-the-blank exercise — they put dialog variables into a file containing statements that control the output format.
Dialog variable	Dialog variables pass information among dialog functions and ISPF services.

A dialog begins either by displaying a selection panel to present the choices available to the user, or by invoking a function to perform some initial processing. When you write a dialog, you can decide which way is best; it depends on the application's requirements.

What is a dialog manager?

A dialog manager provides different kinds of services to dialogs while they are running, and also controls the interaction of the dialog's elements — you could think of it as an extension of the host operating system. For example, ISPF can issue requests for panels to be displayed, files to be searched, and screens to be formatted. It can verify, process, and store input, and it can create output files. ISPF can also function as a simplified data management system for data stored in tables.

The chart below shows the general ISPF dialog management service categories, and the dialog elements with which they interact. Within each category, there are many services, each one performing a very specific function.

<i>ISPF Service Category</i>	<i>Dialog Element</i>
Display	Panels and Messages
Select	Panels and Functions
Table	Tables
File Tailoring	File skeletons
Variable	Dialog Variables

ISPF provides other kinds of services, too. For example, ISPF's graphic services help you add graphic areas to panels you create. The LOG service writes messages to a log file that you can browse to keep track of what happens during an ISPF session.

There are many other ISPF services, but we won't be describing or using all of them in this book. We'll give you the basics here, and you can explore the rest of them later. For more information on all of ISPF's services, see *Dialog Management Services and Examples*.

Invoking ISPF

ISPF is invoked by the ISPSTART EXEC that is shipped with the ISPF product files. This EXEC contains FILEDEF statements for the ISPF product files. Your organization may have different or additional file requirements; before you try invoking ISPF, check with someone else to be sure you have everything that's required. Here's an example of an ISPSTART EXEC:

```
/*ISPSTART EXEC                                     */
Trace Error
argstring = ' '
if arg() >0 Then arg argstring
/*****/
/* ISPPROF is the user profile library.             */
/* Each ISPF user has a profile that is           */
/* generated and updated while ISPF is running.   */
'FILEDEF ISPPROF CLEAR'
'FILEDEF ISPPROF DISK ISPNULL TABLES A (PERM'
/*****/
/* ISPPLIB is the panel library.                   */
'FILEDEF ISPPLIB CLEAR'
'FILEDEF ISPPLIB DISK ISPPLIB MACLIB * (PERM CONCAT'
/*****/
/* ISPMLIB is the message library.                 */
'FILEDEF ISPMLIB CLEAR'
'FILEDEF ISPMLIB DISK ISPMLIB MACLIB * (PERM CONCAT'
/*****/
/* ISPSLIB is the skeleton library.                */
'FILEDEF ISPSLIB CLEAR'
'FILEDEF ISPSLIB DISK ISPNULL SKELS A (PERM'
/*****/
/* ISPTLIB is the table input library.              */
'FILEDEF ISPTLIB CLEAR'
'FILEDEF ISPTLIB DISK ISPTLIB MACLIB * (PERM CONCAT'
/*****/
/* ISPTABL is the table output library.            */
'FILEDEF ISPTABL CLEAR'
'FILEDEF ISPTABL DISK ISPNULL TABLES A (PERM'
/*****/
/* ISPFIL is the file tailoring output library.   */
'FILEDEF ISPFIL CLEAR'
'FILEDEF ISPFIL DISK ISPNULL FTOUT A (PERM'
/*****/
'ISPDCS ISPDCSS ISPVM DMMODE(*) 'argstring
exit
```

Notes:

1. In the line that reads

```
ISPDCS ISPDCSS ISPVM DMMODE(*) 'argstring
```

ISPDCSS and ISPVM are default names that may be different for your organization.

2. To improve performance, you may want to replace the asterisks in the filemode with the letter that represents the disk on your system where the ISPF product files reside.

On the CMS command line, type

```
ispstart
```

That command invokes either the ISPSTART EXEC that is shipped with the product, or the one your organization has tailored for its use. Your organization may also use a different name to invoke the EXEC.

The ISPF Master Application Menu appears on the screen.

```
----- ISPF MASTER APPLICATION MENU -----
OPTION ----> _
1 SAMPLE1 - Sample application 1
2 . - (Description for option 2)
3 . - (Description for option 3)
4 . - (Description for option 4)
5 . - (Description for option 5)
X EXIT - Terminate ISPF using list/log defaults.
USERID - JUDITH
TIME - 16:39
TERMINAL - 3278
PF KEYS - 24
Enter END command to terminate ISPF.
```

Using the ISPF Sample Application

The ISPF Master Application Menu presents a sample application that helps you learn about ISPF. Let's look at it briefly now.

Select the ISPF sample application by entering "1" on the command line. The next panel that appears is a Sample Primary Option Menu.

```
----- SAMPLE PRIMARY OPTION MENU -----  
OPTION  ----> _  
  
0 ISPF PARMS - Specify terminal and user parameters  
1 COMMANDS  - Create/change command table  
2 .         - (Description for option 2)  
3 .         - (Description for option 3)  
4 .         - (Description for option 4)  
5 .         - (Description for option 5)  
T TUTORIAL  - Display information about this applicatin  
X EXIT      - Terminate ISPF using list/log defaults.  
  
Enter END command to terminate application.
```

Select Option 0, ISPF PARMS, by typing "0" on the command line of this panel.

This option allows you to specify certain parameters, including terminal type and PF key definitions, that are used to control your ISPF session.

```
----- ISPF PARAMETER OPTIONS -----  
OPTION  ===> _  
  
 1  TERMINAL  - Specify terminal characteristics  
 2  LOG/LIST  - Specify ISPF console, log and list defaults  
 3  PF KEYS   - Specify PF keys for 3278 terminal with 24 PF keys  
 4  DISPLAY   - Specify screen display characteristics  
 5  LIST      - Specify list file characteristics
```

Select Option 1, TERMINAL.

The Terminal Characteristics panel displays default entries for terminal type, number of PF keys, and other information about the terminal you are using. If the default entries on the panel are incorrect, you can change them by typing over the incorrect entries.

```
----- TERMINAL CHARACTERISTICS -----
COMMAND ==> _
TERMINAL TYPE    ==> 3278          (3277 - 3275/3277 terminal)
                                   (3277A - 3275/3277 with APL keyboard)
                                   (3278 - 3276/3278/3279/3290 terminal)
                                   (3278A - 3276/3278/3279 APL keyboard)
                                   (3278T - 3276/3278/3279 TEXT keyboard)
                                   (3290A - 3290 with APL keyboard)

NUMBER OF PF KEYS ==> 24          (12 or 24)

INPUT FIELD PAD  ==> N            (N - Nulls) (B - Blanks) (Special Character-
                                   must not be the same as COMMAND DELIMITER)

COMMAND DELIMITER ==> ;          (Special character for command stacking)
SCREEN FORMAT    ==> DATA        (Select one of the following:)
  (3278 Model 5 only)              (DATA - Format based on data width)
                                   (STD - Always format 24 lines by 80 chars)
                                   (MAX - Always format 27 lines by 132 chars)

  (3290 only)                      (PART - Format using hardware partitions.
                                   Effective the next ISPF invocation.)
```

Press PF3 (END) to return to the previous panel. Select another option — PF KEYS (Option 3), which displays the current ISPF values for the PF keys on your keyboard, and lets you change them if you want to. Or DISPLAY (Option 4), which lets you choose where you want the command input line to show up on your screen.

When you're finished, press PF4 (RETURN) to return to the Sample Primary Option Panel (notice that you skipped over a panel — PF4 lets you skip over intervening levels of panels to return to the next-highest primary option panel. Otherwise, you'd have to keep pressing PF3). Then press PF3 twice and ENTER once to exit from ISPF.

Now that you've completed your introduction to ISPF, you can tell there's much more to the product than we were able to fit into our discussion. However, you know enough about it to work on the sample dialog in "Part Two: Writing a Dialog." If you want to get more information, look at *Dialog Management Guide* and *Dialog Management Services and Examples*.

If you're going to use ISPF/PDF to work on the sample dialog, continue with Chapter 2, "Introducing ISPF/PDF." If ISPF/PDF isn't available to you, use XEDIT to create the necessary dialog elements. You can skip to Chapter 3, "Designing a Dialog." The remaining chapters contain notes for XEDIT users that tell you how to proceed.

Chapter 2. Introducing ISPF/PDF

This chapter tells you:

- What the ISPF/PDF options are
- How to invoke ISPF/PDF
- How to use ISPF/PDF's edit option.

What is ISPF/PDF?	2-3
Invoking ISPF/PDF	2-6
Using the ISPF/PDF Edit Option	2-9
Using an Edit Profile	2-11
Using PF Keys	2-15
Using Edit Commands	2-17

What is ISPF/PDF?

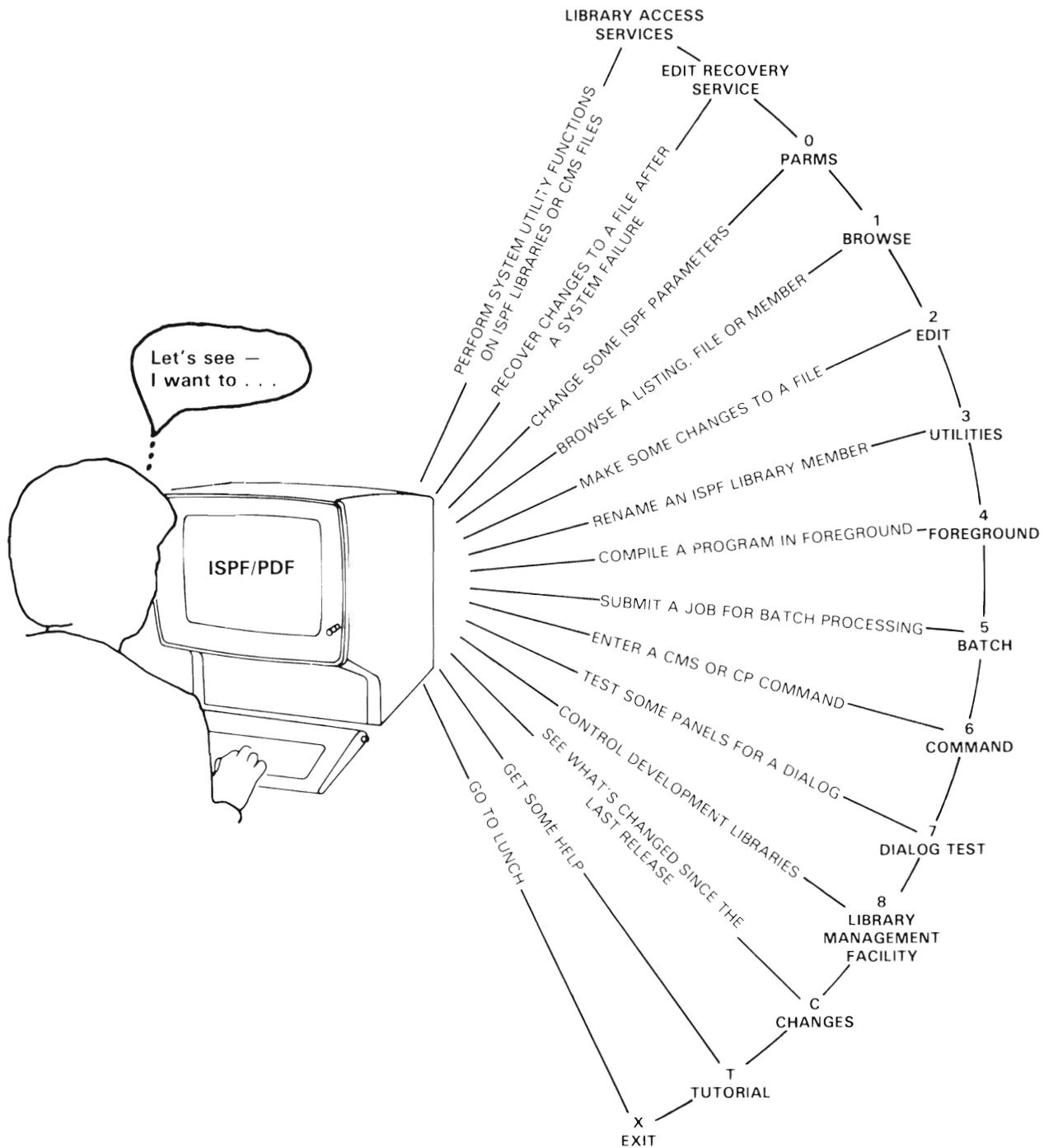
ISPF/PDF is a dialog that runs under ISPF's control, like any dialog you create. ISPF/PDF can help you develop dialogs and other types of applications online. We'll use some of ISPF/PDF's options to develop our sample dialog.

Here's a brief description of each one:

ISPF/PDF Option	Description
Option 0 - ISPF PARMS	Lets you display and change ISPF parameters, such as PF key definitions and terminal characteristics, at any time during an ISPF session.
Option 1 - BROWSE	Displays program code, test data, or documentation; a convenient way to scan large files, such as compiler listings.
Option 2 - EDIT	Helps you create or change program code, test data, or documentation. Special features include edit macros that eliminate repetitive editing tasks, an XEDIT interface, and models that help you create dialog elements.
Option 3 - UTILITIES	Helps you perform system utility and file management functions, such as printing, renaming, deleting or browsing a file, moving or copying a member, and many other tasks.
Option 4 - FOREGROUND	Interactively executes language processing programs, including assembler, COBOL, VS/FORTRAN, PL/I, Pascal, and SCRIPT/VS.

ISPF/PDF Option	Description
Option 5 - BATCH	Generates and submits appropriate host system job statements and command streams for batch execution.
Option 6 - COMMAND	Lets you enter CMS or CP commands, including EXEC 2 or REXX command procedures, while ISPF/PDF is running.
Option 7 - DIALOG TEST	Helps you test individual dialog elements or whole dialogs to make sure everything works the way you want it to.
Option 8 - LM UTILITIES	Helps you make sure you're working with the latest level of your development libraries, and controls who's updating what.
Option C - CHANGES	Keeps you up to date on changes that have been made to ISPF/PDF since Version 1 of the product.
Option T - TUTORIAL	Gives you step-by-step assistance while you're learning to use ISPF/PDF, or when you need to refresh your memory.
Option X - EXIT	Ends an ISPF/PDF session.

ISPF/PDF also provides library access services that help you perform system utility functions on ISPF libraries or CMS files. And an edit recovery service helps you recover changes to a file after a system failure. For more information on ISPF/PDF services, see *ISPF/PDF Services*.



Invoking ISPF/PDF

ISPF/PDF is invoked by the PDF EXEC that is shipped with the product. This EXEC contains FILEDEF statements for the ISPF and ISPF/PDF product files. Your organization may have different or additional file requirements; before you try invoking ISPF/PDF, check with someone else to be sure you have everything that's required.

Here's an example of a PDF EXEC. Notice that the FILEDEF statements for the ISPF/PDF product files come **before** those for the ISPF product files.

```
/*PDF EXEC                               */
  trace error
  argstring = ''
  IF arg() > 0 then arg argstring
/******/
/* ISPPROF is the user profile library.    */
/* Each ISPF user has a profile.          */
'FILEDEF ISPPROF CLEAR'
'FILEDEF ISPPROF DISK ISPNUL TABLES A (PERM '
/******/
/* ISPPLIB is the panel library.          */
'FILEDEF ISPPLIB CLEAR'
/* This is the ISPF/PDF panel library.    */
'FILEDEF ISPPLIB DISK ISRPLIB MACLIB * (PERM CONCAT'
/* This is the ISPF panel library.       */
'FILEDEF ISPPLIB DISK ISPPLIB MACLIB * (PERM CONCAT'
/******/
/* ISPMLIB is the message library.        */
'FILEDEF ISPMLIB CLEAR'
/* This is the ISPF/PDF message library.  */
'FILEDEF ISPMLIB DISK ISRMLIB MACLIB * (PERM CONCAT'
/* This is the ISPF message library.     */
'FILEDEF ISPMLIB DISK ISPMLIB MACLIB * (PERM CONCAT'
```

```

/*****/
/* ISPSLIB is the skeleton library. */
'FILEDEF ISPSLIB CLEAR'
/* This is the ISPF/PDF skeleton library. */
'FILEDEF ISPSLIB DISK ISRSLIB MACLIB * (PERM CONCAT'
/*****/
/* ISPTLIB is the table input library. */
'FILEDEF ISPTLIB CLEAR'
/* This is the ISPF/PDF table input library. */
'FILEDEF ISPTLIB DISK ISRTLIB MACLIB * (PERM CONCAT'
/* This is the ISPF table input library. */
'FILEDEF ISPTLIB DISK ISPTLIB MACLIB * (PERM CONCAT'
/*****/
/* ISPTABL is the table output library. */
'FILEDEF ISPTABL CLEAR'
'FILEDEF ISPTABL DISK ISPNUL TABLES A (PERM'
/*****/
/* ISPFIL is the file tailoring output file. */
'FILEDEF ISPFIL CLEAR'
'FILEDEF ISPFIL DISK ISPNUL FTOUT A (PERM'
/*
'ISPDCS ISPDCSS ISPVM PANEL(ISR@PRIM)',
'NEWAPPL(ISR) DMMODE(*)' argstring
exit

```

Notes:

1. In the line that reads

```
ISPDCS ISPDCSS ISPVM PANEL(ISR@PRIM) ...
```

ISPDCCS and ISPVM are default names that may be different for your organization.

2. To improve performance, you may want to replace the asterisks in the filemode with the letter that represents the disk on your system where the ISPF and ISPF/PDF product files reside.

Invoke ISPF/PDF by typing

pdf

on the CMS command line. That command invokes either the PDF EXEC that is shipped with the product, or the one your organization has tailored for its use. Your organization may also use a different name to invoke the EXEC.

The ISPF/PDF Primary Option Panel appears on your screen.

```
----- ISPF/PDF PRIMARY OPTION PANEL -----
OPTION  ===> _
0 ISPF PARMS - Specify terminal and user parameters  USERID - HUNTER
1 BROWSE     - Display source data or output listings TIME   - 12:47
2 EDIT       - Create or change source data         TERMINAL - 3277
3 UTILITIES  - Perform utility functions            PF KEYS  - 12
4 FOREGROUND - Invoke language processors in foreground
5 BATCH      - Submit to batch for language processing
6 COMMAND    - Enter CMS command or EXEC
7 DIALOG TEST - Perform dialog testing
8 LM UTILITIES- Perform library management facility functions
C CHANGES   - Display summary of changes for this release
T TUTORIAL   - Display information about ISPF/PDF
X EXIT       - Terminate using console, log, and list defaults

Enter END command to terminate ISPF.
```

Using the ISPF/PDF Edit Option

This section gives you some practice using ISPF/PDF's Option 2 to edit a CMS file.

Select the Edit option (Option 2) by typing a "2" on the command line of the ISPF/PDF Primary Option Panel. The Edit-Entry Panel appears next. To create a new file, choose a name for it and enter the file ID as shown below. We call this file PURPLE PROSE A.

```
----- EDIT - ENTRY PANEL -----
COMMAND ---->
ISPF LIBRARY:
PROJECT ---->
GROUP ---->          ---->          ---->
TYPE ---->
MEMBER ---->          (Blank for member selection list)
CMS FILE:
FILE ID ----> PURPLE PROSE A_          FOR NEW CMS FILE OR ISPF MEMBER:
MEMBER ---->          RECFM ----> (F or V)
IF NOT LINKED, SPECIFY:
OWNER'S ID ---->          DEVICE ADDR. ---->          LINK ACCESS MODE ---->
READ PASSWORD ---->          UPDATE PASSWORD ---->
PROFILE NAME ---->          (Blank defaults to type)
INITIAL MACRO ---->          EDITOR ---->          (PDF or XEDIT)
LOCK ---->          XEDIT OPTIONS ---->          (YES or NO)
FORMAT NAME ---->          MIXED MODE ---->          (YES or NO)
```

Press the ENTER key.


```

EDIT --- PURPLE PROSE A ----- COLUMNS 001 072
COMMAND ---->                      SCROLL ==> HALF
***** TOP OF DATA *****
000100 THE RELENTLESS WIND HURLED ICY SHEETS OF RAIN AT THE BROODING
000200 WINDOWS OF THE CRUMBLING 18TH-CENTURY MANSION WHERE I WAS
000300 TRAPPED IN A HIDDEN CHAMBER I HAD DISCOVERED QUITE BY ACCIDENT
000400 WHEN I PULLED WHAT I THOUGHT WAS ONLY A MUSTY, DOG-EARED COPY OF
000500 "TRUE GHOST STORIES FROM THE MIDDLE AGES" OFF THE SHELF IN
000600 THE GLOOMY, CAVERNOUS LIBRARY.
000700 NOW, HERE I WAS, PLUNGED SUDDENLY INTO UTTER DARKNESS, WITH
000800 ONLY A FOUL-SMELLING BOOK IN MY HANDS AND, IN MY POCKETS,
000900 SEVENTY-THREE CENTS' CHANGE, A PIECE OF CHEWING-GUM FOIL COMPLETE
001000 WITH A MUCH-CHEWED WAD OF STALE GUM, AND A PEN THAT HAD RUN OUT
001100 OF INK THE WEEK BEFORE. HOW COULD I HAVE KNOWN THE TERRORS THAT
001200 AWAITED ME AS THE HEAVY DOOR SWUNG SHUT BEHIND ME?
***** BOTTOM OF DATA *****

```

— all the text you just typed is now in capital letters! To understand what caused that to happen, we have to look at the edit profile for this file. First, move the cursor back to the command line by pressing PF12.

Using an Edit Profile

An edit profile is a set of characteristics that defines the way you can edit a file. For example, a profile can be set up to edit data that's all in capital letters, or to edit data that's in mixed-case letters.

ISPF/PDF generates a default edit profile based on the filetype you specify for a new file. Usually, the default profile is suitable for the kind of data you want to put in the file. Sometimes, however, it isn't (as you just discovered).

To look at the edit profile for this file, type:

```
profile 8
```

on the command line. The default edit profile appears in the first eight lines of the file.

```
EDIT --- PURPLE PROSE A ----- COLUMNS 001 072
COMMAND ==> _                      SCROLL ==> HALF
***** ***** TOP OF DATA *****
=PROF> ...PROSE (FIXED - 80)...RECOVERY OFF...NUMBER ON STD.....
=PROF> ...CAPS ON...HEX OFF...NULLS OFF...TABS OFF.....
=PROF> ...ENDSAVE ON...AUTONUM OFF...AUTOLIST OFF...STATS OFF.....
=PROF> ...PROFILE UNLOCK...IMACRO NONE...PACK OFF...NOTE ON.....
=TABS>
=MASK>
=BND$> <
=COL$> -----1-----2-----3-----4-----5-----6-----7--
000100 THE RELENTLESS WIND HURLED ICY SHEETS OF RAIN AT THE BROODING
000200 WINDOWS OF THE CRUMBLING 18TH-CENTRY MANSION WHERE I WAS
000300 TRAPPED IN A HIDDEN CHAMBER I HAD DISCOVERED QUITE BY ACCIDENT
000400 WHEN I PULLED WHAT I THOUGHT WAS ONLY A MUSTY, DOG-EARED COPY OF
000500 "TRUE GHOST STORES FROM THE MIDDLE AGES" OFF THE SHELF IN
000600 THE GLOOMY, CAVERNOUS LIBRARY.
000700 NOW, HERE I WAS, PLUNGED SUDDENLY INTO UTTER DARKNESS, WITH
000800 ONLY A FOUL-SMELLING BOOK IN MY HANDS AND, IN MY POCKETS,
000900 SEVENTY-THREE CENTS' CHANGE, A PIECE OF CHEWING-GUM FOIL COMPLETE
001000 WITH A MUCH-CHEWED WAD OF STALE GUM, AND A PEN THAT HAD RUN OUT
001100 OF INK THE WEEK BEFORE. HOW COULD I HAVE KNOWN THE TERRORS THAT
001200 AWAITED ME AS THE HEAVY DOOR SWUNG SHUT BEHIND ME?
***** ***** BOTTOM OF DATA *****
```

We won't discuss everything that appears in the profile; to get more information about what you can put in an edit profile, refer to *ISPF/PDF Guide*. We do want to mention two things, though.

First, we want to explain why everything you entered in mixed-case letters suddenly changed to upper case. The "CAPS ON" mode means that you can enter input any way you want (all lower case, mixed case, all upper case), but, when you press the ENTER key, or save the file by pressing PF3, everything you entered gets changed to upper case. That's useful when you're working with data that **must** be all upper case; for example, a COBOL program. But, for some files, it can be inconvenient.

You might prefer to have the text in this file appear in mixed-case letters. You can change the profile to make that happen. Type:

```
caps off
```

on the command line, and press the ENTER key.

To clear the edit profile display from the screen, type:

```
reset
```

on the command line. The RESET command doesn't take you out of the file; it simply gets rid of the profile display.

Now, type over a line or two of the upper case text, the way you originally typed it in. Press the ENTER key.

```
EDIT --- PURPLE PROSE A ----- COLUMNS 001 072
COMMAND ===> _                SCROLL ===> HALF
***** TOP OF DATA *****
000100 The relentless wind hurled icy sheets of rain at the brooding
000200 windows of the crumbling 18th-century mansion where I was
000300 trapped in a hidden chamber I had discovered quite by accident
000400 WHEN I PULLED WHAT I THOUGHT WAS ONLY A MUSTY, DOG-EARED COPY OF
000500 "TRUE GHOST STORIES FROM THE MIDDLE AGES" OFF THE SHELF IN
000600 THE GLOOMY, CAVERNOUS LIBRARY.
000700 NOW, HERE I WAS, PLUNGED SUDDENLY INTO UTTER DARKNESS, WITH
000800 ONLY A FOUL-SMELLING BOOK IN MY HANDS AND, IN MY POCKETS,
000900 SEVENTY-THREE CENTS' CHANGE, A PIECE OF CHEWING-GUM FOIL COMPLETE
001000 WITH A MUCH-CHEWED WAD OF STALE GUM, AND A PEN THAT HAD RUN OUT
001100 OF INK THE WEEK BEFORE. HOW COULD I HAVE KNOWN THE TERRORS THAT
001200 AWAITED ME AS THE HEAVY DOOR SWUNG SHUT BEHIND ME?
***** BOTTOM OF DATA *****
```

See the difference?

The other point we want to make here is about sequence numbers in a file. Use PF11 to scroll to the right side of this file. See those numbers over there?

```
EDIT --- PURPLE PROSE A ----- COLUMNS 009 080
COMMAND ==> _ SCROLL ==> HALF
***** TOP OF DATA *****
000100 ntless wind hurled icy sheets of rain at the brooding 00000100
000200 of the crumbling 18th-century mansion where I was 00000200
000300 in a hidden chamber I had discovered quite by accident 00000300
000400 ULLED WHAT I THOUGHT WAS ONLY A MUSTY, DOG-EARED COPY OF 00000400
000500 OST STORIES FROM THE MIDDLE AGES" OFF THE SHELF IN THE 00000500
000600 MY, CAVERNOUS LIBRARY. 00000600
000700 E I WAS, PLUNGED SUDDENLY INTO UTTER DARKNESS, WITH 00000700
000800 OUL-SMELLING BOOK IN MY HANDS AND, IN MY POCKETS, 00000800
000900 THREE CENTS' CHANGE, A PIECE OF CHEWING-GUM FOIL COMPLETE 00000900
001000 UCH-CHEWED WAD OF STALE GUM, AND A PEN THAT HAD RUN OUT 00001000
001100 HE WEEK BEFORE. HOW COULD I HAVE KNOWN THE TERRORS THAT 00001100
001200 ME AS THE HEAVY DOOR SWUNG SHUT BEHIND ME? 00001200
***** BOTTOM OF DATA *****
```

They're called sequence numbers, and they keep track of the number and sequence of the lines of data in a file.

Use PF10 to scroll back to the left side of the file. Look at the edit profile again. In this edit profile, sequence numbering is "on" ("NUMBER ON STD"). That's okay for certain kinds of data; PL/I programs are a good example. But (and this is an important point), **when you are creating panels and messages for your ISPF dialog, you must be sure to set sequence numbering to "off" before you begin entering data** (if the edit profile you're using isn't already set up that way).

Here's why. When you try to run the dialog, or try to use ISPF/PDF's Dialog Test option (Option 7) to test the panel and message definitions, they won't format properly, because the processing will read the sequence numbers as part of the definitions. You'll get a message about "invalid characters" in the file, and no matter how thoroughly you review your input, you'll forget that, over there to the right, where you can't see them, are those sequence numbers....

So, save yourself a great deal of time — always check the edit profile before you begin to enter data in a new file, and make sure the defaults are appropriate for the kind of data you want to put in the file.

To get rid of the sequence numbers, type:

```
unnum
```

on the command line. Notice that NUMBER ON STD changes to NUMBER OFF in the profile. Now, scroll to the right side of the file. The numbers have disappeared!

```
EDIT --- PURPLE PROSE A ----- COLUMNS 009 080
COMMAND ==> _                      SCROLL ==> HALF
***** ***** TOP OF DATA *****
000100 ntless wind hurled icy sheets of rain at the brooding
000200 of the crumbling 18th-century mansion where I was
000300 in a hidden chamber I had discovered quite by accident
000400 ULLED WHAT I THOUGHT WAS ONLY A MUSTY, DOG-EARED COPY OF
000500 OST STORIES FROM THE MIDDLE AGES" OFF THE SHELF IN THE
000600 MY, CAVERNOUS LIBRARY.
000700 E I WAS, PLUNGED SUDDENLY INTO UTTER DARKNESS, WITH
000800 OUL-SMELLING BOOK IN MY HANDS AND, IN MY POCKETS,
000900 THREE CENTS' CHANGE, A PIECE OF CHEWING-GUM FOIL COMPLETE
001000 UCH-CHEWED WAD OF STALE GUM, AND A PEN THAT HAD RUN OUT
001100 HE WEEK BEFORE. HOW COULD I HAVE KNOWN THE TERRORS THAT
001200 ME AS THE HEAVY DOOR SWUNG SHUT BEHIND ME?
***** ***** BOTTOM OF DATA *****
```

Enter the RESET command to clear the profile display from the screen.

Using PF Keys

The PF keys on your terminal have default settings for use with ISPF and ISPF/PDF. You don't have to use the PF keys at all, but they do make it easier to perform certain tasks. So far, you've used PF3 to save and exit from a file, PF4 to skip screens and go directly to the next-highest primary option panel, PF10 to scroll left, PF11 to scroll right, and PF12 to move the cursor back to the command line.

The default values shown below apply to PF keys 1 through 12 on a 12-key terminal, or PF keys 13 through 24 on a 24-key terminal.

PF1/PF13	HELP	Displays error message and tutorial information.
PF2/PF14	SPLIT	Splits the screen at the cursor location, and displays the ISPF/PDF Primary Option Panel on the second screen.
PF3/PF15	END	Ends the current task and returns to the previous panel.
PF4/PF16	RETURN	Returns to the previous Primary Option Panel without displaying intervening levels of panels.
PF5/PF17	RFIND	Repeats the previous FIND command in EDIT and BROWSE services.
PF6/PF18	RCHANGE	Repeats the previous CHANGE command in the EDIT service.
PF7/PF19	UP	Scrolls toward the top of the data.
PF8/PF20	DOWN	Scrolls toward the bottom of the data.
PF9/PF21	SWAP	In split-screen mode, moves the cursor from one logical screen to the other.
PF10/PF22	LEFT	Scrolls left.
PF11/PF23	RIGHT	Scrolls right.
PF12/PF24	CURSOR	Moves the cursor to the first input field on the current panel (usually the option selection or command field at top of screen).

Pressing a PF key has the same effect as typing the command on the command line and pressing the ENTER key. For instance, if a panel gives directions like this:

Enter the END command to terminate.

you get the same result (termination) whether you type in the word "END" or press PF3.

While you're still in this file, practice using some of the PF keys. For example, try:

- Scrolling down to the bottom of the file, and then scrolling back to the top.
- Requesting help.
- Splitting the screen, and swapping the cursor between the screens (to end split-screen mode, use PF3). See what happens if you try to edit the same file on both screens.

For more information about PF keys, see *ISPF/PDF Guide*.

Using Edit Commands

There are two kinds of commands in ISPF/PDF's Edit option:

- Primary commands
- Line commands.

You've already used primary commands; they're the ones you type in on the command line at the top of your edit files. For example, you've used PROFILE, CAPS OFF, UNNUM, and RESET.

Line commands are commands that you enter on the edit line numbers, which are located on the left side of the file.

Suppose you want to add a line or a group of lines to this file. You can use the "insert lines" line command, like this:

```
***** ***** TOP OF DATA *****
000100
i00200 This line command inserts one line.
000300
i50400 This line command inserts five lines.
000500
```

Try it!

To delete a line or a group of lines from a file, type:

```
***** ***** TOP OF DATA *****
000100
d00200 This line command deletes one line.
000300
000400
000500
d30600 This line command deletes lines 000600, 000700, and 000800.
000700
000800
000900
dd1000 This pair of line commands deletes lines 001000, 001100,
001100 and 001200.
dd1200
001300
001400
001500
```

To repeat a line or a group of lines in another place in the file, type:

```
***** ***** TOP OF DATA *****
000100
r00200 This line command repeats line 000200 once.
000300
r40400 This line command repeats line 000400 four times.
000500
rr0600 This pair of line commands repeats lines 000600, 000700,
000700 000800, and 000900 once.
000800
rr0900
001000
001100
rr2200 This pair of line commands repeats lines 001200, 001300, and
001300 001400 twice.
rr1400
001500
001600
000017
```

If you want more information about edit primary and line commands, see *ISPF/PDF Guide*.

Now, press PF3. That saves the file, and takes you back to the edit entry panel, where you see the "FILE SAVED" message in the short-message area in the upper right-hand corner of the edit entry panel:

```
----- EDIT - ENTRY PANEL ----- FILE SAVED
COMMAND ==>
ISPF LIBRARY·
PROJECT ==>
GROUP ==>
TYPE ==>
MEMBER ==> (Blank for member selection list)
CMS FILE: FOR NEW CMS FILE OR ISPF MEMBER:
FILE ID ==> PURPLE PROSE A_ RECFM ==> (F or V)
MEMBER ==> LRECL ==>
IF NOT LINKED, SPECIFY·
OWNER'S ID ==> DEVICE ADDR. ==> LINK ACCESS MODE ==>
READ PASSWORD ==> UPDATE PASSWORD ==>
PROFILE NAME ==> (Blank defaults to type)
INITIAL MACRO ==> EDITOR ==> (PDF or XEDIT)
LOCK ==> XEDIT OPTIONS ==> (YES or NO)
FORMAT NAME ==> MIXED MODE ==> (YES or NO)
```

You've just completed your introduction to editing with ISPF/PDF. In "Part Two: Writing a Dialog," you'll use the skills you learned in this chapter to write an ISPF dialog.

Part Two: Writing a Dialog

In Part Two, you use some of ISPF/PDF's options to create the panels, messages, and functions for a sample ISPF dialog. If you don't have access to ISPF/PDF, you can use XEDIT to create the files you need.

It may seem to you that you aren't using ISPF for much of the work you do in Part Two. Actually, you are — ISPF is controlling everything that you do. Among other things, it is displaying the ISPF/PDF panels you request, determining what messages to display on the panels, and interpreting the commands you enter. And, in Chapter 7, "Putting It All Together," ISPF helps you combine all of the dialog elements into one dialog.

Chapter 3. Designing a Dialog

This chapter presents the input, output, and processing requirements for an online calendar application. The application isn't complex, but it has enough detail to give you practice with some ISPF and ISPF/PDF basics. You can probably think of many ways to extend and personalize the application after you've practiced with it.

Input	3-3
Output	3-4
Processing Sequence	3-4
Required Dialog Elements	3-5
Dialog Element Files	3-7
Setting up Dialog Element Files	3-7
Defining Dialog Element Files to VM/SP	3-7

Suppose you decided to write an online replacement for your desk calendar — something simple that could tell you at a glance what's on your schedule for a particular day. It could even print an activity report, just in case somebody else wants to know how you've been spending your time.

Here's one way to do it — the Personal Scheduling Manager (PSM, for short).

Input

You provide PSM with the following input:

- date — mm/dd/yy format
- time — hh:mm, in 24-hour format
- description — up to 24 characters
- notes — up to 24 characters (for example, notes to yourself about work to do to prepare for meetings).

The image shows a hand-drawn calendar page for January 31st. At the top, the number '31' is written in large, outlined digits. To the right, the date 'Thursday January 31 1985' is stamped. The page is divided into a grid of time slots. The times listed on the left side are: 7:00, 7:30, 8:00, 8:30, 9:00, 9:30, 10:00, 10:30, 11:00, 11:30, 12:00, 1:00, 1:30, and 2:00. A meeting is scheduled for 9:00 AM, with the description 'Meeting - Conference Room B' and the handwritten note 'BRING FOOD!' written across the 9:00 and 9:30 slots. The rest of the slots are empty.

Output

PSM displays a daily calendar that lists times, descriptions, and notes for all appointments. PSM can also print an activity report that lists activities for a particular day.

Processing Sequence

1. The PSM dialog begins either when you select it from among choices listed on the ISPF Master Application Panel, or when you enter the ISPSTART command on the CMS command line. There's a more detailed explanation of how to start the dialog in Chapter 7, "Putting It All Together."
2. PSM displays a task selection panel, with choices as follows:

- 1 — Enter or update activity information

When you select this option, a data entry panel prompts you to enter the date and time, and then press the ENTER key. On the next panel, enter or update the description and notes for the activity. Type in "END" (or press PF3) to file the information and exit from this panel. Type in "CANCEL" to exit from this panel without saving the information you entered. The panel on which you enter date and time is redisplayed; if you have more than one entry to add, just update the date and time information and continue.

- 2 — Display calendar for the day

A data entry panel prompts you to enter the date for which you'd like to see the calendar entries. After you supply the date and press the ENTER key, you see the calendar entries on your screen.

- 3 — Print activity report for the day

If you select task 3, a data entry panel prompts you for the date for which you want to print an activity report. The dialog uses a file tailoring skeleton to format any information found in the table for that date, and prints each table entry's description and notes for the activity report.

- 4 — Delete entry from calendar

On a data entry panel, enter the dates and times for the activities you want to delete. To delete a whole day's activities, leave the time field blank. You can enter the END command to exit from this task without deleting any activity information.

- X — Exit from PSM.

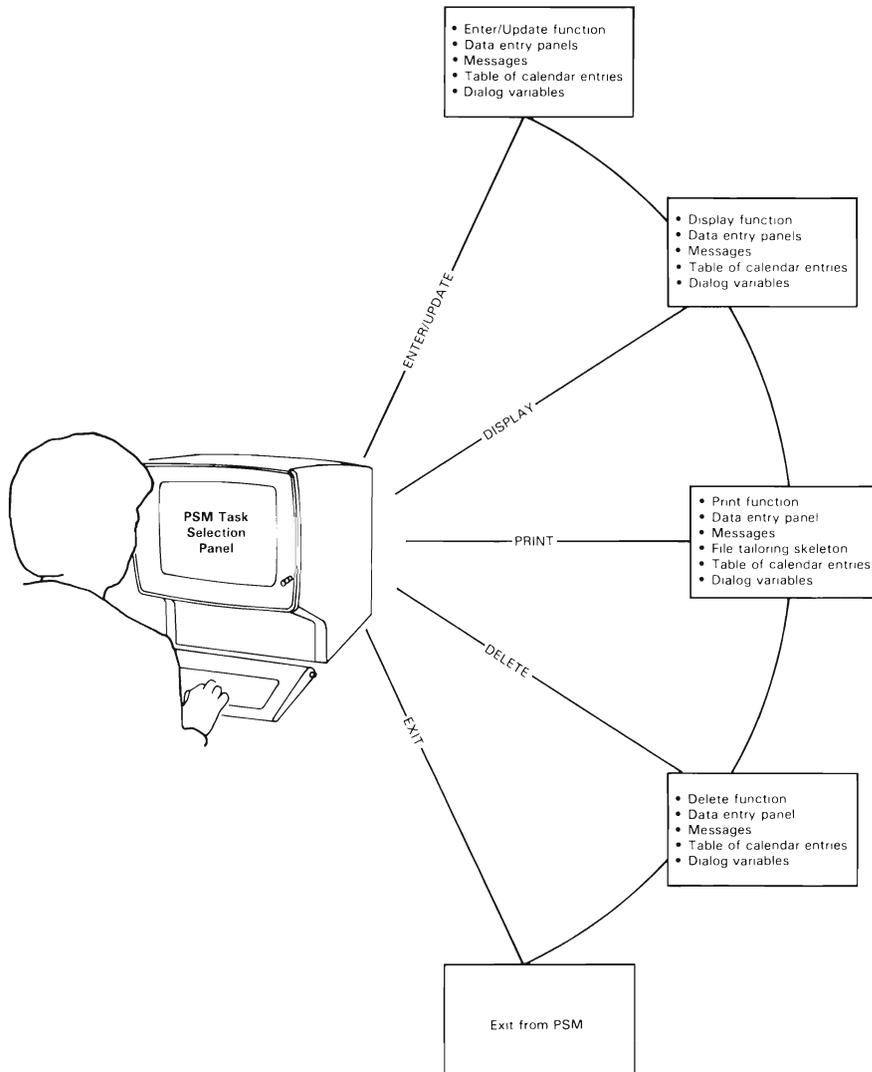
3. If you choose one of the first four tasks, the task selection panel reappears after processing is complete. You can choose another task, or exit.

Required Dialog Elements

Based on the input, output, and processing information we've just presented, we can figure out what dialog elements we need for the PSM application. You can refer to the chart in Chapter 1, "Introducing ISPF," if you need to refresh your memory.

- The dialog has to perform four tasks: enter/update, display, print, and delete. So, we have to write at least one **function**, and perhaps more than one, depending on how we want to set it up.
- To present those four task choices to someone who wants to use PSM, we need a **selection panel**.
- The dialog has to have some way to receive information about activities, so we need **data-entry panels**.
- What if someone who uses this dialog has a question about some part of it? We need to include a **tutorial panel** for each panel in the dialog.
- To store the activity information, we can create a **table**. And, to get the activity information from the data entry panels to the table, we have to define some **dialog variables**.
- There has to be some way for the dialog to communicate information about errors or processing; we can write some **messages**.
- To print the activity report, we need a **file tailoring skeleton**.

This diagram shows what dialog elements we need for each task.



Dialog Element Files

There are several ways to set up your dialog element files. We explain one way here; you can read the *Dialog Management Guide* to learn about the other formats.

Setting up Dialog Element Files

The PSM dialog element files are grouped as sets of CMS files with the same filetype. For example, all PSM panel definitions are stored in files with CMS file IDs that look like this:

```
(panel name) PANELS A
```

The chart below shows the CMS file IDs for the PSM dialog element files.

<i>Dialog Element</i>	<i>CMS File ID</i>
Panels	(panel name) PANELS A
Messages	(message name) MSGS A
File tailoring skeleton	(skeleton name) SKELS A
Functions	(function name) EXEC A
Table	(table name) TABLES A

Defining Dialog Element Files to VM/SP

In Chapter 1, “Introducing ISPF” and Chapter 2, “Introducing ISPF/PDF,” we showed you FILEDEF statements for the ISPF and ISPF/PDF product files. You checked to be sure you had all the appropriate FILEDEF statements so you could invoke ISPF and ISPF/PDF. Now, you have to do the same thing for the PSM dialog element files.

Whenever you create a dialog element file, you must be sure there is a FILEDEF statement associated with the file. That is the only way ISPF will be able to find the file when an application requests a particular dialog element (unless you use a special ISPF service that lets you define application files while a dialog is running, but we aren’t doing that in this book).

For example, this is the FILEDEF statement we are using to define the panel files to ISPF:

```
FILEDEF ISPPLIB DISK ISPNULL PANELS A (PERM CONCAT
```

ISPNULL is being used as a filename placeholder. You can change ISPNULL to something else, if you like, as long as the filetype is PANELS. That's because, when ISPF has to search for panel definitions, the search is by filetype, not filename.

The series of FILEDEF statements for panels (including both PSM dialog element files and product files) is:

```
FILEDEF ISPPLIB CLEAR
FILEDEF ISPPLIB DISK ISPNULL PANELS A (PERM CONCAT
FILEDEF ISPPLIB DISK ISRPLIB MACLIB * (PERM CONCAT
FILEDEF ISPPLIB DISK ISPLIB MACLIB * (PERM CONCAT
```

You must put the FILEDEF statement for your panel files, or those for any other dialog element, **before** the FILEDEF statements for the product files. When ISPF searches for a dialog element (for example, when a dialog has to display a particular panel, and ISPF has to find the correct panel definition), the dialog element files you created should be searched first.

For messages, use these FILEDEF statements:

```
FILEDEF ISPMLIB CLEAR
FILEDEF ISPMLIB DISK ISPNULL MSGS A (PERM CONCAT
FILEDEF ISPMLIB DISK ISRMLIB MACLIB * (PERM CONCAT
FILEDEF ISPMLIB DISK ISPLIB MACLIB * (PERM CONCAT
```

The FILEDEF statements for skeleton files are:

```
FILEDEF ISPSLIB CLEAR
FILEDEF ISPSLIB DISK ISPNULL SKELS A (PERM CONCAT
FILEDEF ISPSLIB DISK ISRSLIB MACLIB * (PERM CONCAT
```

Use these FILEDEF statements for table input files:

```
FILEDEF ISPTLIB CLEAR
FILEDEF ISPTLIB DISK ISPNUL TABLES A (PERM CONCAT
FILEDEF ISPTLIB DISK ISRTLIB MACLIB * (PERM CONCAT
FILEDEF ISPTLIB DISK ISPTLIB MACLIB * (PERM CONCAT
```

The FILEDEF statements for the table output file are:

```
FILEDEF ISPTABL CLEAR
FILEDEF ISPTABL DISK ISPNUL TABLES A (PERM
```

The FILEDEF statements for the file tailoring output file are:

```
FILEDEF ISPFIL CLEAR
FILEDEF ISPFIL DISK ISPNUL FTOUT A (PERM
```

Now ISPF can find the PSM dialog element files you're about to create.

Chapter 4. Defining Panels

This chapter shows you how to create and test the panel definitions for the PSM application.

Creating a Panel Definition	4-3
Testing a Panel Definition	4-11
Other Panel Definitions	4-15

Creating a Panel Definition

Select the ISPF/PDF Edit option (Option 2) by typing a "2" on the command line of the ISPF/PDF Primary Option Panel.

Note: ISPF/PDF users can choose to use either the PDF editor (Option 2) or XEDIT to create the PSM dialog elements. If you are using XEDIT under ISPF/PDF, you can ignore the notes to XEDIT users that appear throughout this chapter. They are for users who have access **only** to XEDIT and not to ISPF/PDF.

When the Edit Entry Panel appears, enter the file ID for the PSM task selection panel, like this:

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

ISPF LIBRARY:
PROJECT ===>
GROUP   ===>          ===>          ===>
TYPE    ===>
MEMBER  ===>          (Blank for member selection list)

CMS FILE:
FILE ID ===> PSM PANELS A_          FOR NEW CMS FILE OR ISPF MEMBER:
MEMBER  ===>          RECFM ===>          (F or V)
IF NOT LINKED, SPECIFY:
OWNER'S ID ===>          DEVICE ADDR. ===>          LINK ACCESS MODE ===>

READ PASSWORD ===>          UPDATE PASSWORD ===>

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

INITIAL MACRO ===>          EDITOR          ===>          (PDF or XEDIT)
LOCK          ===>          XEDIT OPTIONS ===>          (YES or NO)

FORMAT NAME  ===>          MIXED MODE      ===>          (YES or NO)
```

Press ENTER.

Before we actually begin to create our first panel definition, let's look at the edit profile for this file.

Note: XEDIT users — You know how to create a new edit file. Before you do that, make sure you have an edit profile that's appropriate for editing mixed-case data, with no sequence numbering. Next, study the chart on page 4-8 that describes the sections of an ISPF panel definition and then enter the PSM panel definition shown on page 4-9.

Type

```
profile 8
```

on the command line. Notice that sequence numbering is NUMBER ON STD. On the command line, type

```
unnum
```

The number mode changes to NUMBER OFF. Now, the edit profile you use for editing files with a filetype of PANELS will automatically turn off the sequence numbering. You're all set to edit! Type

```
reset
```

to clear the profile display from the screen. Then, type

```
model
```

and press ENTER.

That command gets you into ISPF/PDF's edit models. A model is a predefined set of statements for a dialog element (for example, a panel) that you can copy into the file you are editing, and then modify to suit your needs.

Because the file we are editing has a filetype of PANELS, the "MODEL" command lets us bypass the Model Class Selection Panel, and go directly to the Panel Model Selection Panel.

```
----- PANEL MODELS -----  
OPTION ----> _  
  
PANEL FORMATS:  
F1 ENTRY - Data entry F4 TDISPL - Table Display  
F2 MULTIPLE - Multiple column F5 TUTORIAL - Help/tutorial  
F3 SELECTION - Panel selection  
  
STATEMENTS:  
S1 ASSIGN - Assignment statement  
S2 ATTR - Attribute section header - )ATTR  
S3 ATTRIB - New attribute character definition  
S4 BODY - Body section header - )BODY  
S5 CONTROL - Control variables  
S6 IF - If statement  
S7 MODEL - Model section header - )MODEL  
S8 VER - Verify statement  
S9 VPUT - Variable put statement  
SA REFRESH - Refetch variables prior to redisplay  
SB ATTRIBA - New attribute character definition for areas  
  
Enter END command to cancel MODEL command.
```

Copy the selection panel model into your file by typing:

F3

on the command line, and pressing ENTER.

Before we do any work with this model, let's take a few minutes to talk about panels in general.

An ISPF panel definition contains up to 7 sections. Each of the sections begins with a header statement, whose first character is ')'. Let's briefly look at each of the sections; we discuss them in the order in which they must appear (if they do appear) in the panel definition. Not all panels require all sections; so, depending on which model you specify, you won't see every section that's described in this chart.

Use the PF8 key to scroll down and find each section as you review the chart.

```

)ATTR DEFAULT (%+_ )
/* % TYPE(TEXT) INTENS(HIGH)      data displayed for      */
/* + TYPE(TEXT) INTENS(LOW)       information only         */
/* _ TYPE(INPUT) INTENS(HIGH) CAPS(ON) JUST(LEFT)         */
)BODY
%----- TITLE FOR SELECTION PANEL -----
%SELECTION ==>_ZCMD
+
+ THIS DIRECTION LINE TELLS THE USER HOW TO USE THE PANEL:
+
+ %1+ SELECTION 1      Description or explanatory text for selection 1
+ %2+ SELECTION 2      Description or explanatory text for selection 2
+ %3+ SELECTION 3      Description or explanatory text for selection 3
+ %4+ SELECTION 4      Description or explanatory text for selection 4
+ %5+ SELECTION 5      Description or explanatory text for selection 5
+ %6+ SELECTION 6      Description or explanatory text for selection 6
+ %7+ SELECTION 7      Description or explanatory text for selection 7
+
+                          that requires more than one line
+
+ OPTIONAL BOTTOM DIRECTION LINE.
+
)INIT
.HELP = TUTORPAN      /* insert name of tutorial panel */
)PROC
&ZSEL=TRANS(TRUNC(&ZCMD, '.'))
      1, 'PANEL(PANEL1) NEWAPPL '
      2, 'CMD(COMMAND2) '
      3, 'PGM(PRGNAME1) NEWPOOL '
      4, 'PGM(PRGNAME2) PARM(PARAMETER) '
      5, 'PGM(PRGNAME3 .TRAIL) NOCHECK '
      6, 'PANEL(PANEL2) '
      7, 'PGM(PRGNAME4) PARM(&VARIABLE) '
      *, '?' )
)END

```

Section	Header	Description
attribute	)ATTR	Defines special characters used in the body of the panel definition to signify field attributes such as highlighting and color.
body ¹	)BODY	Defines the format of the panel as it will be seen by the user, and defines the name of each variable field on the panel.
model	)MODEL	Defines the format of each row of scrollable data; FOR TABLE DISPLAY PANELS ONLY.
initialization	)INIT	Specifies initial processing to take place before the panel is displayed; initializes variables.
reinitialization	)REINIT	Specifies processing to take place before a panel is redisplayed.
processing	)PROC	Specifies processing to take place after the panel has been displayed or redisplayed; defines how to verify and translate variables.
end ¹	)END	Specifies the end of the panel definition.

¹ This section is **required** to be part of the panel definition; all other sections are optional.

Now, look at the PSM panel definition below.

```
)ATTR DEFAULT(%+_ )
/* THIS IS THE PSM TASK SELECTION PANEL.                */
/* IT INVOKES THE FOLLOWING REXX EXECs:                 */
/*     PSMXENT  - ENTER OR UPDATE ENTRIES IN THE CALENDAR */
/*     PSMXDISP - DISPLAY THE CALENDAR FOR THE DAY        */
/*     PSMXPRT  - PRINT AN ACTIVITY REPORT FOR THE DAY    */
/*     PSMXDEL  - DELETE AN ENTRY OR A DAY FROM THE CALENDAR */
)BODY
%----- Personal Scheduling Manager -----
%OPTION ==>_ZCMD
+
+ %1+ ENTER    - Enter or update calendar entry
+ %2+ DISPLAY  - Display calendar for the day
+ %3+ PRINT    - Print activity report for the day
+ %4+ DELETE   - Delete entry from calendar
+ %X+ EXIT     - Exit from PSM
+
+
)INIT
  .HELP = PSM1
)PROC
  &ZSEL=TRANS (TRUNC(&ZCMD, '.'))
              1, 'CMD(PSMXENT)'
              2, 'CMD(PSMXDISP)'
              3, 'CMD(PSMXPRT)'
              4, 'CMD(PSMXDEL)'
              ',',' '
              X, 'EXIT'
              *, '?'
)END
```

Modify each section of the panel model in your PSM file so it looks like this. You can type over the words that are on the panel, and delete any sections you don't need. Use the PF keys and edit line commands you practiced with in "Using the ISPF/PDF Edit Option" on page 2-9.

Don't be concerned if you don't understand some parts of the panel definition right now. The next few chapters will help you fill in the blanks.

When you finish, press PF3 to go back to the Edit Entry Panel. Look for the message "FILE SAVED" in the short message area in the upper right-hand corner of the panel.

```
----- EDIT - ENTRY PANEL ----- FILE SAVED
COMMAND ---->
ISPF LIBRARY:
PROJECT ----> _
GROUP ---->
TYPE ---->
MEMBER ----> (Blank for member selection list)
CMS FILE:
FILE ID ----> PSM PANELS A FOR NEW CMS FILE OR ISPF MEMBER:
MEMBER ----> RECFM ----> (F or V)
IF NOT LINKED, SPECIFY: LRECL ---->
OWNER'S ID ----> DEVICE ADDR. ----> LINK ACCESS MODE ---->
READ PASSWORD ----> UPDATE PASSWORD ---->
PROFILE NAME ----> (Blank defaults to type)
INITIAL MACRO ----> EDITOR ----> (PDF or XEDIT)
LOCK ----> XEDIT OPTIONS ----> (YES or NO)
FORMAT NAME ----> MIXED MODE ----> (YES or NO)
```

Press PF3 once more, to go back to the ISPF/PDF Primary Option Panel.

Note: XEDIT users — You can skip the next section, "Testing a Panel Definition," and pick up again with "Other Panel Definitions" on page 4-15 .

Testing a Panel Definition

ISPF/PDF's Dialog Test option (Option 7) can test each dialog element separately — panels, messages, functions, variables, or calls to ISPF services. Or, it can test a completed dialog.

To test the PSM panel definition, select Option 7 on the ISPF/PDF Primary Option Panel.

The Dialog Test Primary Option Panel appears next.

```
----- DIALOG TEST PRIMARY OPTION PANEL -----  
OPTION ===> _  
  
 1 FUNCTIONS      - Invoke dialog function/selection panel  
 2 PANELS        - Display panels  
 3 VARIABLES     - Display/set variable information  
 4 TABLES      - Display/modify table information  
 5 LOG           - Browse ISPF log  
 6 DIALOG SERVICES - Invoke dialog services  
 7 TRACES       - Specify trace definitions  
 8 BREAKPOINTS  - Specify breakpoint definitions  
 T TUTORIAL    - Display information about Dialog Test  
 X EXIT        - Terminate dialog testing  
  
Enter END command to terminate dialog testing.
```

From the list of choices, select Option 2 (Panels). On the dialog test panel titled "Display Panel", type in "PSM", and press ENTER.

```
----- DISPLAY PANEL -----  
COMMAND ---->  
PANEL NAME    ----> PSM_  
MESSAGE ID    ---->                (Optional)  
CURSOR        ---->                (Optional)  
CURSOR POSITION ---->                (Optional)
```

You should see the panel displayed like this:

```
----- Personal Scheduling Manager -----  
OPTION ==> _  
  
1 ENTER - Enter or update calendar entry  
2 DISPLAY - Display calendar for the day  
3 PRINT - Print activity report for the day  
4 DELETE - Delete entry from calendar  
X EXIT - Exit from PSM
```

Helpful Hints

Hint #1

If you get an error message instead of a panel, make sure you didn't make one of these fairly common mistakes:

- Forget to issue a FILEDEF statement for the file. If you forgot, you get the message, "PANEL NOT FOUND".
- Edit the panel with NUM ON in the edit profile. Refer to "Using an Edit Profile" on page 2-11 to see how to correct this mistake. If number mode was on, you'll receive a message about an error on the first panel section header — for example,)ATTR, the attribute section header.
- Copy something incorrectly
- Forget the)END statement at the end of the panel definition
- Use an attribute character in the text of the panel definition. Actually, this error may allow the panel to display, but everything on the panel that comes after the incorrect use of the attribute character may get displayed with the attribute character definition. For example, if you use "%" to define highlighting, and you also use that character in the text (as in "The number must be at least 10% greater than...."), the words "greater than" and everything that comes after them will be highlighted.

Hint #2

When you test dialog elements, use ISPF/PDF's split-screen capability, so you can work with two logical screens at once. On one screen, you can display the test results. On the other, you can make any necessary changes to the file.

Start out in the edit option. Move the cursor about one-third of the way down the file, and press PF2.

The ISPF/PDF Primary Option Panel appears on the second screen. Select the appropriate Dialog Test option (panels or messages, for example), and enter the name of the dialog element file in the appropriate field on the Dialog Test panel. If the testing shows some errors, use PF9 to swap screens, and correct the errors in the edit copy of the file.

Other Panel Definitions

Here are the rest of the panel definitions for the PSM dialog. Following each panel definition, we show you the way each panel looks when it is properly formatted.

We've included comment statements in these panel definitions, to help you figure out what the different sections and statements mean. You can type them into your own panel definitions if you want to, but you don't have to.

You can use ISPF/PDF's edit models to create these panel definitions, or use the **Helpful Hint** below as another way to save time.

Note: XEDIT users — Now that you've created your first panel definition, you can save some time by using it when you create the others. Copy the PSM PANELS A file into another file, and make the required changes.

A Helpful Hint

When you are creating several panel definitions that are very similar, you can create one, and then copy it into the other files and make the necessary modifications. So, you don't have to use the models, but you can still create your panels fairly quickly.

There are two ways to copy one file to another: the extended copy capability in ISPF/PDF's edit option, and Option 3.3, the Move/Copy Utility.

Using Extended Copy

If you are already editing a file, you can copy information from one file to another without leaving your edit session.

On the Edit-Entry Panel, type in the name of the new panel definition file; for example, PSMDISP PANELS A. Press the ENTER key.

Type

copy

on the command line of the PSMDISP PANELS A file. The Edit-Copy panel appears on the screen, and you enter the name of the current panel definition file as follows:

```
----- EDIT - COPY -----
COMMAND ---->
"CURRENT" FILE: PSMDISP PANELS A
ISPF LIBRARY:
PROJECT ---->
GROUP ---->      ---->      ---->      ---->
TYPE ---->
MEMBER ---->      (Blank for member selection list)

FROM CMS FILE:
FILE ID ----> PSM PANELS A_
MEMBER ---->      (For MACLIB or TXTLIB)
IF NOT LINKED, SPECIFY:
OWNER'S ID ---->      DEVICE ADDR. ---->      LINK ACCESS MODE ---->

READ PASSWORD ---->
LINE NUMBERS (BLANK FOR ENTIRE MEMBER OR SEQUENTIAL FILE):
FIRST LINE ---->
LAST LINE ---->
NUMBER TYPE ---->      (STANDARD, COBOL, or RELATIVE)

Press ENTER key to copy or enter END command to cancel copy.
```

Press the ENTER key. The PSMDISP PANELS A file now contains a copy of the panel definition found in PSM PANELS A. All you have to do is change what's different between the two panels.

Using the Move/Copy Utility

Select option 3 from the ISPF/PDF Primary Option Panel. The Utility Selection Panel appears on the screen.

```
----- UTILITY SELECTION PANEL -----
OPTION  ===>  _
  1  LIBRARY  - Library utility:
                Print index listing or entire file
                Print, rename, delete, or browse members
                Compress ISPF library or CMS MACLIB
  2  FILE     - File utility:
                Specify or unspecify ISPF library
                Display ISPF library or CMS file information
                Rename or delete ISPF library or CMS file
  3  MOVE/COPY - Move or copy members or files
  4  FILE LIST - Print or display ISPF project or CMS file listing
  5  RESET    - Reset statistics for members of ISPF library
  6  SPOOL    - Initiate spool output
  7  READER   - Retrieve batch output from reader
  8  RETRIEVE - Retrieve ISPF-MVS libraries from tape
  9  COMMAND  - Create/change an application command table
 10  CONVERT  - Convert old format messages/menus to new format
 11  FORMAT   - Format definition for formatted data edit/browse
```

Select option 3, the Move/Copy Utility.

On the next panel that appears, enter the name of the file you want to copy information from; in our example, you'd enter:

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

C - Copy file or member(s)          CP - Copy and print
M - Move file or member(s)         MP - Move and print
L - Copy and lock member(s)        LP - Copy, lock, and print
P - Promote file or member(s)      PP - Promote and print

SPECIFY "FROM" FILE BELOW, THEN PRESS ENTER TO SPECIFY "TO" FILE

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

FROM CMS FILE:                               (Not valid for options L and LP)
FILE ID ==> PSM1 PANELS A_
MEMBER  ==>                               (For MACLIB or TXTLIB)
IF NOT LINKED, SPECIFY:
OWNER'S ID ==>      DEVICE ADDR. ==>      LINK ACCESS MODE ==>

READ PASSWORD ==>      UPDATE PASSWORD ==>
```

Press the ENTER key, and on the next panel enter the name of the file to which you want the information copied. In our example, that's:

```
COPY --- FROM PSM PANELS A -----
COMMAND ---->

SPECIFY "TO" FILE BELOW.

TO ISPF LIBRARY:
PROJECT ---->
GROUP ---->
TYPE ---->

TO CMS FILE:                                FOR CMS FILE OR ISPF LIBRARY MEMBERS:
FILE ID ----> psmdisp panels a_                RECFM ----> (F or V)
                                                LRECL ---->
IF NOT LINKED, SPECIFY:
OWNER'S ID ---->          DEVICE ADDR. ---->          LINK ACCESS MODE ---->

UPDATE PASSWORD ---->

"TO" LIBRARY/FILE OPTIONS:
IF LIBRARY, REPLACE LIKE-NAMED MEMBERS ----> YES (YES or NO)
IF SEQUENTIAL, OLD (REWRITE) OR MOD (APPEND) ----> OLD (OLD or MOD)
SPECIFY PACK OPTION FOR "TO" FILE ----> (YES, NO, or blank)
```

Press the ENTER key. Look for the message "FILE COPIED" in the short-message area of the Edit-Entry Panel.

Press PF4 to return to the Primary Option Panel without stopping at the Utility Selection Panel. Now, PSMDISP PANELS A is ready for you to edit!

Use ISPF/PDF Option 7.2 to make sure the PSMDISP panel formats properly.

```
----- Personal Scheduling Manager: Set Date and Time -----  
COMMAND ===>
```

```
Enter the date and the time of day:
```

```
   Date   ===>  00 / 00 / 00  (Enter mm/dd/yy)  
   Time   ===>  00 : 00      (Enter hh:mm in 24-hour format)
```

```
Press the ENTER key to process; enter the END command to terminate.
```

PSMENT — This data entry panel requests description and notes for each new calendar entry.

```
)ATTR DEFAULT(%+_)  
  /* displayed by PSMXENT EXEC */  
  # TYPE(output) INTENS(low) JUST(right) PAD(0)  
  /* output field right-justified, padded with 0*/  
  $ TYPE(INPUT) INTENS(high) PAD(_) CAPS(off)  
  /* input field padded with '_' */  
)BODY  
%----- Personal Scheduling Manager: Enter Data -----  
%COMMAND ==>_ZCMD %  
%  
+ Enter activity description and notes below:  
+  
+ Date: #MT+/#DY+/#YR+  
+  
+ Time: #HR+:#MN+  
+  
+ Description%==>$DESC +  
+ Notes %==>$NOTES +  
+  
+  
+  
+  
+  
+  
+  
+ Enter the%END+command to file the information and exit this panel.  
+ Enter the%CANCEL+command to exit this panel without filing information.  
)INIT  
 .HELP = PSM2  
)PROC  
  &COMMAND = ' ' /* initialize variable to blanks */  
  IF (&ZCMD=CAN,CANCEL) /* allow 'CAN' or 'CANCEL' to quit */  
  &COMMAND = CANCEL /* set variable for EXEC */  
)END
```

The PSMENT panel looks like this when you test it.

```
----- Personal Scheduling Manager: Enter Data -----  
COMMAND ===>  
  
Enter activity description and notes below:  
  
Date: 00 / 00 / 00  
Time: 00 : 00  
  
Description ===> _____  
Notes          ===> _____  
  
  
Enter the END command to file the information and exit this panel.  
Enter the CANCEL command to exit this panel without filing information.
```

Note: If there were entries in the table, the date and time fields on this panel would be filled in. When we test the completed dialog in Chapter 7, "Putting It All Together," we can supply some table entries, so these fields will have data in them.

PSMDAY — This table display panel displays all activities that have the date you specified on the PSMSET panel.

```

)ATTR DEFAULT(%+@)
    /* displayed by PSMXDISP EXEC */
    /* '@' used for input, because '_' used on panel */
    ! type(output) intens(low) just(left ) pad(' ')
    # type(output) intens(low) just(right) pad('0')
)BODY
%----- Personal Scheduling Manager: Daily Schedule -----
%COMMAND ==>@ZCMD                                %SCROLL ==>@AMT +
%
+
+           % Things to do:  +
+
+           Date: #MT+/#DY+/#YR+
+
%Time      Description                               Notes
%-----
+
)MODEL ROWS(SCAN) /* Format table; scan for rows. */
#z +:#z +!z                                +!z
)INIT
    .HELP = PSM4
    .ZVARS = '(HR MN DESC NOTES)' /* Replace 'z's with variables. */
    &AMT = PAGE /* Set a scroll amount for this panel. */
)END

```

Here's what the PSMDAY panel looks like:

```
----- Personal Scheduling Manager: Daily Schedule -----  
COMMAND ===> _ SCROLL ===> PAGE  
  
          Things to do:  
          Date: 00 / 00 / 00  
  
Time      Description      Notes  
-----  
00 : 00
```


Here's what the PSMDEL panel looks like:

```
----- Personal Scheduling Manager: Delete Calendar Entry -----  
COMMAND ===>
```

```
Enter the date and time for the entries you want to delete. Leave the  
time field blank to delete all calendar entries for the date entered.
```

```
   Date   ===>  00 / 00 / 00   (Enter mm/dd/yy)  
   Time   ===>  00 : 00       (Enter hh:mm in 24-hour format)
```

```
Enter the END command to exit this function without deleting the entries.
```

PSM1 — This is the first in a series of tutorial panels that give you information about PSM. We show you this one as an example — you can use it as a guide to create the others, which are mentioned in some of the panel definitions you've already created, and in the messages you define in the next chapter.

```
)BODY
%----- Personal Scheduling Manager: Tutorial -----
%SELECTION ==>_ZCMD +
+
%
| Personal Scheduling Manager |
+-----+
+
The Personal Scheduling Manager (PSM) helps you keep
track of your daily schedule. You can add or update
calendar entries, display your schedule for the day,
print a report of your activities, and delete days from
the calendar.

You can look at the following topics in sequence, or select
each one by number:

%1+ Enter or update activity information
%2+ Display calendar for the day
%3+ Print activity report
%4+ Delete entries from calendar
)PROC
&ZSEL = TRANS( &ZCMD
              1,PSM2
              2,PSM3
              3,PSM4
              4,PSM5
              *,'?'
              )
)END
```

Here's what the PSM1 panel looks like:

```
----- Personal Scheduling Manager: Tutorial -----
SELECTION ----> _

      -----
      | Personal Scheduling Manager |
      -----

The Personal Scheduling Manager (PSM) helps you keep
track of your daily schedule. You can add or update
calendar entries, display your schedule for the day,
print a report of your activities, and delete entries
from the calendar.

You can look at the following topics in sequence, or select
each one by number:

1 Enter or update activity information
2 Display calendar for the day
3 Print activity report
4 Delete entries from calendar
```

Note: Once you've created and tested this panel, try testing the PSM panel once again. This time, when the PSM panel is formatted, press PF1 (HELP). You'll see PSM1! If you're wondering why, look at the)INIT section of PSM.

Chapter 5. Defining Messages

This chapter shows you how to create and test the message definitions for the PSM application.

Writing Message Definitions	5-3
Testing Messages	5-7
Testing Messages Only	5-7
Testing Messages and Panels	5-10

Writing Message Definitions

Select the Edit option from the ISPF/PDF Primary Option Panel. On the edit entry panel, type the CMS file ID shown below, and press the ENTER key.

```
----- EDIT - ENTRY PANEL -----  
COMMAND ===>  
  
ISPF LIBRARY:  
PROJECT ===>  
GROUP   ===>           ===>           ===>           ===>  
TYPE    ===>  
MEMBER  ===>           (Blank for member selection list)  
  
CMS FILE:                                FOR NEW CMS FILE OR ISPF MEMBER:  
FILE ID ===> PSM00 MSGS A_                RECFM ===> (F or V)  
MEMBER  ===>                               LRECL ===>  
IF NOT LINKED, SPECIFY:  
OWNER'S ID ===>           DEVICE ADDR. ===>           LINK ACCESS MODE ===>  
  
READ PASSWORD ===>           UPDATE PASSWORD ===>  
  
PROFILE NAME ===>           (Blank defaults to type)  
  
INITIAL MACRO ===>           EDITOR           ===>           (PDF or XEDIT)  
LOCK          ===>           XEDIT OPTIONS ===>           (YES or NO)  
  
FORMAT NAME  ===>           MIXED MODE      ===>           (YES or NO)
```

On the command line of the next screen, type:

```
profile 8
```

This is the default edit profile for messages. Notice that sequence numbering is NUMBER ON STD. Enter the UNNUM command to set sequence numbering to NUMBER OFF. From now on, when you edit a file with a filetype of MSGS, the sequence numbers won't appear. Type:

```
reset
```

to get rid of the profile. Then, type:

```
model
```

to put the message model in the PSM00 file.

```
EDIT --- PSM00 MSGS A ----- COLUMNS 001 072
COMMAND ---> _                SCROLL ---> CSR
***** TOP OF DATA *****
000001 MSGX990 'SHORT MSG IN QUOTES....' .HELP=PNELID .ALARM=NO
000002 'LONG MESSAGE MUST ALSO BE IN QUOTES - SECOND LINE.....'
=NOTE= MSGX990 - IS A MESSAGE ID (1-5 ALPHA, 3 NUMERIC)
=NOTE= SHORT-MSG - OPTIONAL, MAXIMUM OF 24 CHARACTERS.
=NOTE= LONG-MSG - REQUIRED, MAXIMUM OF 79 CHARACTERS.
=NOTE= PNELID - SPECIFIES A TUTORIAL PANEL ID. THE PANEL IS TO BE
=NOTE= DISPLAYED IF THE USER REQUESTS HELP SUPPORT. IF
=NOTE= * IS SPECIFIED, THEN THE TUTORIAL PAGE WILL BE
=NOTE= WHATEVER WAS SPECIFIED IN THE PANEL DEFINITION.
=NOTE= NO - NO = DO NOT SOUND AUDIBLE ALARM
=NOTE= YES = SOUND AUDIBLE ALARM
***** BOTTOM OF DATA *****
```

Using the model as a guide, type in these messages:

```
PSM000 'ENTER VALID MONTH          ' .HELP=* .ALARM=YES
'VALID MONTHS ARE NUMBERS FROM 01 - 12.'
```

```
PSM001 'ENTER VALID DAY              ' .HELP=* .ALARM=YES
'VALID DAYS ARE NUMBERS FROM 01 - 31.'
```

```
PSM002 'ENTER VALID YEAR            ' .HELP=* .ALARM=YES
'ENTER THE LAST TWO DIGITS OF THE YEAR (85 FOR 1985, ETC.)'
```

```
PSM003 'ENTER VALID HOUR            ' .HELP=* .ALARM=YES
'VALID HOURS ARE NUMBERS FROM 00 - 23.'
```

```
PSM004 'ENTER VALID MINUTE          ' .HELP=* .ALARM=YES
'VALID MINUTES ARE NUMBERS FROM 00 - 59.'
```

```
PSM005 'TASK COMPLETED             ' .HELP=* .ALARM=NO
'A ROW HAS EITHER BEEN UPDATED OR ADDED TO THE TABLE.'
```

```
PSM006 'NO SCHEDULE FOUND           ' .HELP=* .ALARM=YES
'USE OPTION 1 (ENTER) TO CREATE A TABLE FOR YOUR DAILY SCHEDULE.'
```

```
PSM007 'FUNCTION SUCCESSFUL         ' .HELP=* .ALARM=NO
'THE REQUESTED FUNCTION ENDED SUCCESSFULLY.'
```

```
PSM008 'REQUEST CANCELLED           ' .HELP=* .ALARM=YES
'REQUEST WAS CANCELLED DUE TO "END" OR ERROR ON PANEL.'
```

```
PSM009 'DATE OR TIME NOT FOUND      ' .HELP=* .ALARM=YES
'THE DATE OR TIME WAS NOT FOUND IN THE CALENDAR.'
```

Press PF3 to save this file.

In Chapter 4, “Defining Panels,” you typed some message numbers in the)PROC sections of a few of the panels. Let’s look at the)PROC section of the PSMDEL panel once again.

```
)PROC
  VER(&MT, NONBLANK, RANGE, 01, 12, MSG=PSM000) /* verify month */
  VER(&DY, NONBLANK, RANGE, 01, 31, MSG=PSM001) /* verify day */
  VER(&YR, NUM, MSG=PSM002) /* verify year */
  VER(&HR, RANGE, 00-23, MSG=PSM003) /* verify hour */
  VER(&MN, RANGE, 00, 59, MSG=PSM004) /* verify minute */
```

The statements in the)PROC section are called VER statements (short for “verify”). Their function is to make sure that all input is valid. If there is an error in the input, the message associated with the message number on the VER statement gets displayed in the short message area of the panel.

For example, message PSM000 (ENTER VALID MONTH) would be displayed in the short message area of the PSMDEL panel if someone entered a number for the MT (month) variable that was not within the range from 01 to 12, inclusive.

Testing Messages

There are two ways to use Dialog Test to test messages:

- To make sure the message is displayed properly
- To make sure the correct message is displayed in response to incorrect input entered on a particular panel.

Testing Messages Only

To see only the text of the message, select Dialog Test option 7.2 (Panels). Enter the message ID as follows:

```
----- DISPLAY PANEL -----  
COMMAND ===>  
PANEL NAME    ===>  
MESSAGE ID    ===> PSM000_    (Optional)  
CURSOR        ===>           (Optional)  
CURSOR POSITION ===>           (Optional)
```

The result looks like this:

```
----- MESSAGE DISPLAY PANEL ----- ENTER VALID MONTH  
COMMAND ====> _  
      This panel is used to display your specified message.
```

Try testing each of the messages in the PSM00 MSGS file. Press PF1 to get the long message format to appear on the screen.

```
----- MESSAGE DISPLAY PANEL ----- ENTER VALID MONTH  
COMMAND ===>     
VALID MONTHS ARE NUMBERS FROM 01 - 12.  
    This panel is used to display your specified message.
```

Testing Messages and Panels

When you want to make sure the right message is being displayed on a panel, you also use Option 7.2. However, you type in just the name of a panel, and, when the panel is displayed in proper format, try entering some incorrect data to see if you get an error message, like this:

```
----- Personal Scheduling Manager: Set Date and Time ----- ENTER VALID MONTH  
COMMAND ==>
```

```
Enter the date and the time of day:
```

```
Date   ==> 99 / 04 / 85 (Enter mm/dd/yy)  
Time   ==> 00 : 00    (Enter hh:mm in 24-hour format)
```

```
Press the ENTER key to process; enter the END command to terminate.
```

And, if you press PF1, you get the long message as well.

Helpful Hints

- Every VER (verify) statement should have an associated error message; otherwise, the system default error message will be used.
- Use vocabulary familiar to the person who will be reading the messages.
- Make the messages active, rather than passive.

For example, instead of saying,

```
The date field input was entered incorrectly.
```

try saying,

```
Re-enter the date field information.
```

- Use the panel's default message areas. The short message area is the upper right-hand corner of the panel; the long message area is the third line of the panel.
- For every error message, set `.ALARM = YES`.
- When the message is displayed, position the cursor to the field that's incorrect — it helps users to find the errors more quickly.
- Use dialog variables in message text to make messages more applicable to a specific situation.

Chapter 6. Coding Functions

In this chapter, you code and test the functions for the PSM application.

Coding a Function	6-3
Testing a Function	6-6
Other PSM Functions	6-9

Coding a Function

The PSM dialog starts with a selection panel, PSM, which lists the available processing choices:

- Enter or update activity information
- Display a daily schedule
- Print a daily schedule
- Delete activity information
- Exit from PSM.

If you select one of the first four tasks, a function is invoked to perform the required processing.

The PSM functions are written in the REXX command procedure language. You could use EXEC 2 to write them, or a high-level programming language such as COBOL, PL/I, FORTRAN, or Pascal. ISPF/PDF has models that can help you code ISPF service statements in these languages.

Function PSMXENT creates a table and puts the activity information you enter into the table's rows. PSMXENT uses the following ISPF services:

- Table services (used with PSMTABLE)

TBOPEN — opens an existing permanent table for processing

TBCREATE — creates a new table, and opens it for processing

TBSORT — sorts a table

TBTOP — sets the table's current row pointer to the top of the table, above the first row

TBSCAN — searches the table for a row that matches a list of "argument" variables, and retrieves the row, if found

TBMOD — updates a table row, if it exists and if search keys match; otherwise, adds a new row to the table

TBCLOSE — closes the table

- Display services

DISPLAY — reads panel definitions, initializes variables, and displays panels (and messages, if required). In this function, panels PSMDISP and PSMENT are displayed.

SETMSG — constructs a specified message from the message file (in this case, PSM00 MSGS A). The message is superimposed on the next panel displayed by any ISPF service. This function displays the PSM005 message.

Note: As we did for the panel definitions, we've included comment statements with each function to help you figure out what's going on. You can type these statements into your own function files, or you can omit them.

Create your own PSMXENT EXEC file by typing that file ID on the Edit-Entry Panel. Then, type in the function as shown on the next page.

```

/*****
/* PSMXENT - REXX function to enter values into a table */
/*****
address 'ISPEXEC' /* set addressability to ISPF services */
message = ' ' /* initialize messages */
setrc = 0
parse value date('u') with MT '/' DY '/' YR /* today's date */
'TBOPEN PSMTABLE'
if rc = 8 then /* table doesn't exist */
do /* create and sort the table */
'TBCREATE PSMTABLE keys(HR MN DY MT YR) names(DESC NOTES)'
'TBSORT PSMTABLE fields(YR,n,a,MT,n,a,DY,n,a,HR,n,a,MN,n,a)'
end
do while setrc = 0 /* display panel until END */
'DISPLAY panel (PSMDISP)' /* panel to set date/time */
if rc = 0 then /* no errors from panel */
do
entrc = 0
'TBTOP PSMTABLE' /* begin table search for row with */
'TBSCAN PSMTABLE arglist(DY,MT,YR,HR,MN)' /* date, time*/
if rc = 8 then /* row does not exist */
do
desc = ' ' /* initialize panel fields */
notes = ' '
end
do while entrc = 0 /* modify table entry */
'DISPLAY panel (PSMENT)' /* panel to enter activities */
entrc = rc /* if END, exit loop */
if command = 'CANCEL' then /* CANCEL command entered */
entrc = 10 /* set return code to exit */
else if entrc = 8 then /* END - save data */
do /* modify or add row to */
'TBMOD PSMTABLE order' /* table in sort order */
if rc = 0 | rc = 8 then /* row added or updated */
message = 'PSM005' /* set completion message */
end
end
else /* end display loop */
setrc = rc /* exit loop */
if message ^= ' ' then /* if message set */
do
'SETMSG msg('message')' /*display message on next panel*/
end
end /* end display loop */
'TBCLOSE PSMTABLE'
exit 0

```

Testing a Function

To test the PSMXENT function, select Option 7.1 from the ISPF/PDF Primary Option Panel, and type:

```
----- INVOKE DIALOG FUNCTION/SELECTION PANEL -----  
COMMAND ===>  
  
INVOKE SELECTION PANEL:  
  PANEL ===>                                OPT ===>  
  
INVOKE COMMAND:  
  CMD ===> PSMXENT_  
  
  LANG ===>                                (APL or blank)  
INVOKE PROGRAM/SHARED SEGMENT:  
  PGM ===>                                DCSS ===>  
  
  PARM ===>                                EXTENDED PLIST ===> NO  
  
NEWAPPL      ===> NO                        ID ===>  
NEWPOOL      ===> NO                        PASSLIB ===> NO
```

When the function's processing sequence begins, you can enter data (try entering correct and erroneous data, to see if you get the right error messages). At the end of the testing, you get a message like this:

```
----- INVOKE DIALOG FUNCTION/SELECTION PANEL -----FUNCTION RC=0
COMMAND ---->

INVOKE SELECTION PANEL:
  PANEL ---->                                OPT ---->

INVOKE COMMAND:
  CMD ----> PSMXENT_
  LANG ---->                                (APL or blank)

INVOKE PROGRAM/SHARED SEGMENT:
  PGM ---->                                DCSS ---->
  PARM ---->                                EXTENDED PLIST ----> NO
  NEWAPPL ----> NO                          ID ---->
  NEWPOOL ----> NO                          PASSLIB ----> NO
```

But, suppose something goes wrong — maybe you don't get the proper message. Or, maybe you want to double-check that the table was created, and that it looks the way you want it to look. Dialog Test to the rescue!

The TRACES option (Option 7.7) lets you trace dialog service calls and dialog variable use, and puts the information in the ISPF log file. You can use the LOG option (Option 7.5) to browse the log file.

The BREAKPOINT option (Option 7.8) lets you specify places to temporarily suspend processing, so you can look at, and even change, the contents of variables or table rows. Then, you can let processing continue with the new data, and see what happens.

For more information about the other Dialog Test options, see *ISPF/PDF Guide*.

Other PSM Functions

The rest of the PSM functions are shown on the following pages, along with explanations of the ISPF services they use.

Note: Once we describe an ISPF service as it's used in one function, we don't describe it again in the writeups for the others (unless it's used differently somewhere else).

Function PSMXDISP displays daily schedules. PSMXDISP uses the following ISPF services:

- Table services (used with PSMTABLE)

TBOPEN

TBVCLEAR — sets to NULL dialog variables that correspond to variables in the table.

TBSARG — establishes a search argument for use with TBSCAN or TBDISPL.

TBCLOSE

- Display services

DISPLAY — displays PSMSET and PSMDAY panels

TBDISPL — combines information from a panel definition with information in tables to display selected table rows and allow users to identify rows for processing. In this function, TBDISPL combines information from the PSMDAY panel and the PSMTABLE table.

SETMSG — PSM006 and PSM008.

```

/*****
/*  PSMXDISP - REXX function to perform the display of the    */
/*  daily schedule.                                          */
/*****

address 'ISPEXEC'
message = ' ' /* set addressability to ISPF services          */
              /* initialize messages                          */

'TBOPEN PSMTABLE' /* open the table          */

if rc = 8 then /* if table not found */
  message = 'PSM006'
  /* set message - table doesn't exist          */
else /* sort table          */
  if rc = 0 then /* table found & opened */
    do
      parse value date('u') with MO '/' DA '/' YE
      /* set date to today          */
      'DISPLAY panel (PSMSET)' /* display panel to set date */
      if rc ^= 0 then /* error or END on panel          */
        message = 'PSM008'
        /* set message - no changes made          */
      end
    end

if message = ' ' then /* if no errors occurred */
  do
    /* display items for one day in order          */
    'TBVCLEAR PSMTABLE' /* clear table variables for TBSARG          */
    YR = YE /* set year for search (TBSARG)          */
    MT = MO /* set month for search (TBSARG)          */
    DY = DA /* set day for search (TBSARG)          */
    'TBSARG PSMTABLE namecond(YR,eq,MT,eq,DY,eq)'
    /* TBDISPL - use only rows with requested date          */
    'TBDISPL PSMTABLE panel(PSMDAY)' /* table display panel          */
    'TBCLOSE PSMTABLE'
  end

if message ^= ' ' then /* if messages are set          */
  'SETMSG msg('message')' /* display error messages          */

exit 0

```

Function PSMXPRT prints an activity report. Here are the ISPF services used by PSMXPRT:

- Table services (used with PSMTABLE)

TBOPEN

TBSCAN

TBCLOSE

- DISPLAY — PSMSET panel

- File tailoring services (used with file tailoring skeleton PSM SKELS)

FTOPEN — prepares file tailoring process, specifies whether a temporary file is to be used for output

FTINCL — specifies skeleton to be used, and starts tailoring process

FTCLOSE — ends the file tailoring process.

- SETMSG — PSM006, PSM007, PSM008, and PSM009.

```

/*****
/* PSMXPRT - REXX function to print the activity report. */
/*****

address 'ISPEXEC' /* set addressability to ISPF services */
message = ' ' /* initialize messages */

fileout = 'PSMTODAY FTOUT A' /* set file ID for output */

'TBOPEN PSMTABLE' /* open table */
if rc = 0 then /* if no errors from TBOPEN */
do
  parse value date('u') with MO '/' DA '/' YE
  /* set date to today */
  'DISPLAY panel (PSMSET)'
  /* panel to set date to print */
  if rc = 0 then /* enter key from panel and no errors */
  do
    MT = MO /* set month from panel for scan */
    DY = DA /* set day from panel for scan */
    YR = YE /* set year from panel for scan */
    'TBSCAN PSMTABLE arglist(MT DY YR) noread'
    /* search for date */
    if rc ^= 0 then /* date not found in table */
      message = 'PSM009' /* set message for no date */
    end
  else /* END or error from data panel */
    message = 'PSM008' /* set request canceled message */
    'TBCLOSE PSMTABLE' /* close before file tailoring */
  end
else if rc = 8 then /* table not found */
  message = 'PSM006' /* set message for create table */

if message = ' ' then /* no errors so far */
do
  'FTOPEN' /* file tailoring uses ISPF FILEDEF */
  /* open for file tailoring */
  'FTINCL' PSM /* use file tailoring skeleton 'PSM' */
  'FTCLOSE name (PSMTODAY)' /* put output to this file */
  address 'CMS' 'PRINT' fileout
  /* print output using CMS print */
  if rc = 0 then /* if no errors from print then */
    message = 'PSM007' /* set message for success */
  end
if message ^= ' ' then /* if error occurred */
  'SETMSG msg('message')' /* set message for display */

exit 0

```

The file tailoring skeleton PSM SKELS formats the rows in PSMTABLE that you want to print as an activity report.

File tailoring skeletons can seem confusing at first, but once you've reviewed this one and designed one or two of your own, you'll see that they aren't so bad after all. ISPF/PDF has edit models for skeleton statements, and you can always refer to them to make sure you're correct.

In the PSM skeleton, the lines that begin with)CM are comments; the skeleton ignores them when it formats an output file.

The line that reads

```
)TB 10 40
```

sets up tabs that place the output in columns across the page. To see how the columns come out, look at the sample output on page 6-16.

The)BLANK statement controls vertical spacing. For example,

```
)BLANK 1
```

puts a blank line in the output file, so the printout will have an extra space between lines of text.

The)DOT and)ENDDOT statements mark the group of statements that actually control what table is read, what entries are selected, and how those entries are formatted.

The)SEL statement is like an IF/THEN statement; only those entries that match the requested date are chosen for the activity report.

The exclamation point (!) is the tab character. When the skeleton is formatting the activity report and encounters an exclamation point, it moves to the next tab position and continues printing.

```
)CM THIS SKEL IS USED BY THE REXX EXEC PSMXPRT.  
)CM IT IS USED TO PRINT AN ACTIVITY REPORT.  
)CM FORMAT THE OUTPUT, USING TB TO SET TABS  
)CM AND BLANK TO SET SPACES.  
)TB 10 40  
)BLANK 4  
)CM ENTER YOUR NAME IN THE FOLLOWING LINE  
        ACTIVITY REPORT FOR your name  
)BLANK 1  
        &MO/&DA/&YE  
)BLANK 1  
)CM SET THE HEADINGS FOR THE COLUMNS  
)CM ('!' IS THE TAB CHARACTER)  
!ACTIVITY !NOTES  
!_____ !_____  
)BLANK 1  
)DOT PSMTABLE  
)CM USE ONLY THE ENTRIES FOR THE REQUESTED DATE  
)SEL &MT = &MO && &DY = &DA && &YR = &YE  
!&DESC !&NOTES  
)ENDSEL  
)ENDDOT
```

Here's an example of some output that was formatted by the PSM skeleton.

<u>Activity</u>	<u>Notes</u>
Meeting	Remember to go
Coffee Break	Keep it short - 45 min.
Lunch	Read <u>War and Peace</u>
Review draft	Try to stay awake
Coffee break	Another short one
Go home	A hard day at work?

A Helpful Hint

If you're testing a function that uses a file tailoring skeleton to generate output, you can use ISPF/PDF's Browse option (Option 1) to look at the file tailoring output.

Select Option 1 from the Primary Option Panel and enter the name of the file tailoring output file on the Browse-Entry Panel. To look at a PSM activity report, enter:

```
----- BROWSE - ENTRY PANEL -----
COMMAND ---->

ISPF LIBRARY:
PROJECT ---->
GROUP  ---->          ---->          ---->          ---->
TYPE   ---->
MEMBER ---->          (Blank for member selection list)

CMS FILE:
FILE ID ----> PSMTODAY FTOUT A_
MEMBER ---->          (for MACLIB or TXTLIB)
IF NOT LINKED, SPECIFY:
OWNER'S ID ---->          DEVICE ADDR. ---->          LINK ACCESS MODE ---->

READ PASSWORD ---->

MIXED MODE  ---->          (SPECIFY YES OR NO)

FORMAT NAME ---->
```

Press the ENTER key to view the contents of the file.

Function PSMXDEL erases values from a table. This function uses the following ISPF services:

- Table services (used with PSMTABLE)

TBOPEN

TBSCAN

TBDELETE — deletes a row from a table.

TBCLOSE

- DISPLAY — PSMDEL panel
- SETMSG — PSM006, PSM007, and PSM009.

```

/*****
/* PSMXDEL - REXX function to delete the rows in a table that */
/* correspond to the requested date and time. */
/*****

address 'ISPEXEC'          /* set addressability to services*/
message = ' '              /* initialize error message */

'TBOPEN PSMTABLE'
if rc = 8 then             /* table doesn't exist */
  message = 'PSM006'      /* set message for no table */
else if rc = 0 then       /* table exists */
  do
    parse value date('u') with MT '/' DY '/' YR
  /* set date to today */
  'DISPLAY panel (PSMDEL)' /* panel to set date and time */
  if rc = 0 then          /* enter key pressed, no errors */
    do
      if HR ^= ' ' then
        delete = 'one'    /* delete only one entry */
        fndrc = 0
        do while fndrc = 0 /* loop while row found */
          if delete = 'one' then /* only delete one row */
            'TBSCAN PSMTABLE arglist(MT DY YR HR MN)'
            /* find row with time & date */
          else /* delete whole day */
            'TBSCAN PSMTABLE arglist(MT DY YR)'
            /* find next row with requested date */
          if rc = 0 then /* row found by TBSCAN */
            do
              'TBDELETE PSMTABLE' /* delete table row */
              if rc = 0 then /* row successfully deleted */
                message = 'PSM007' /* set information message */
            end
          else if rc = 8 then /* no more items found by TBSCAN */
            do
              fndrc = rc /* exit loop */
              if message = ' ' then /* no message if delete ok */
                message = 'PSM009' /* set message to not found */
            end
          end /* end scan/delete loop */
        end
      'TBCLOSE PSMTABLE'
    end
  if message ^= ' ' then /* if error occurred */
    'SETMSG msg('message')' /* display message */

exit 0

```

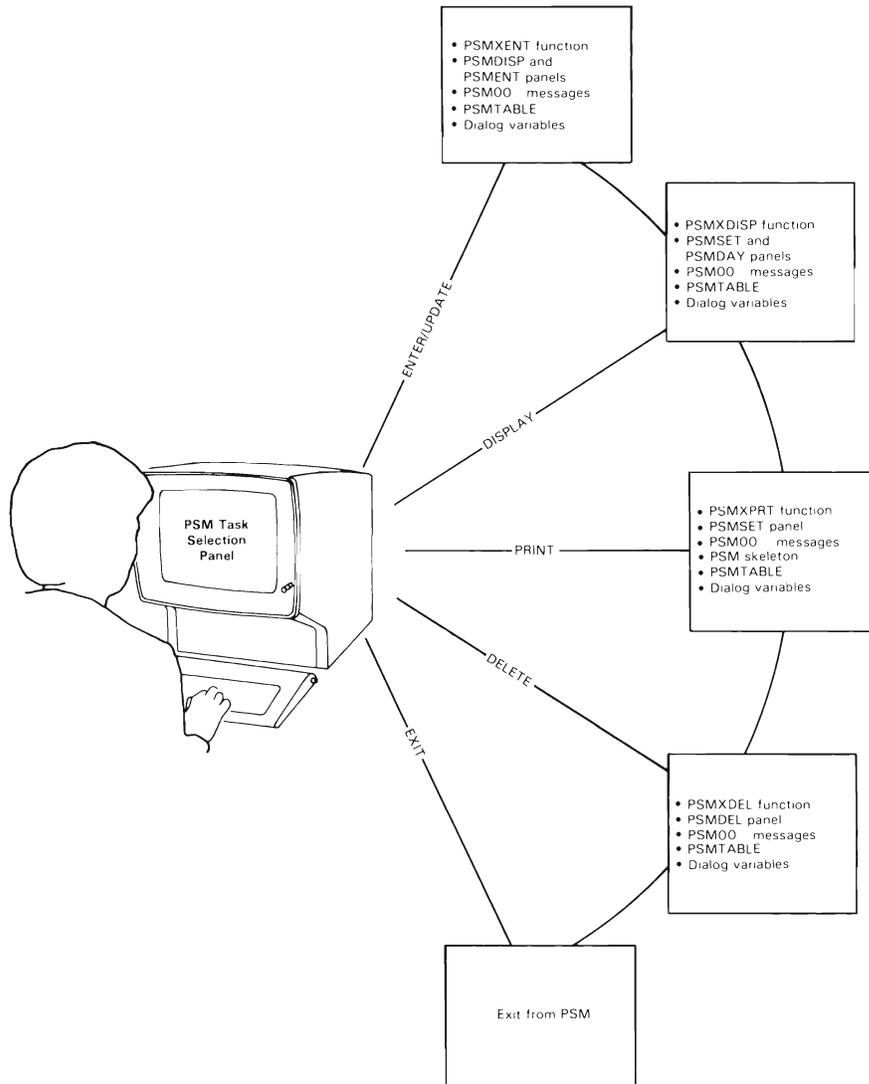

Chapter 7. Putting It All Together

In this chapter, we finally combine all the dialog elements you've been busy creating. We use Dialog Test to test the completed dialog, and show you how to add the dialog to the ISPF Master Application Panel, so you can run it whenever you like. We explain how to invoke ISPF to run the dialog, and give you some instructions about re-coding the functions from command procedures to programs.

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An Overview

The diagram below shows how each element fits into the PSM dialog.



Testing the Whole Dialog

Select option 7.1 from the ISPF/PDF Primary Option Panel. On the next panel, type:

```
----- INVOKE DIALOG FUNCTION/SELECTION PANEL -----  
COMMAND ===>  
  
INVOKE SELECTION PANEL:  
  PANEL  ===> PSM_          OPT  ===>  
  
INVOKE COMMAND:  
  CMD    ===>  
  LANG   ===>              (APL or blank)  
  
INVOKE PROGRAM/SHARED SEGMENT:  
  PGM    ===>              DCSS  ===>  
  PARM   ===>              EXTENDED PLIST  ===> NO  
  
NEWAPPL      ===> NO      ID    ===>  
NEWPOOL      ===> NO      PASSLIB  ===> NO
```

Why the panel name? Because the PSM dialog processing begins with a panel. If the processing began with a function, you'd enter the name of the function in either the CMD field (for an EXEC) or the PGM field (for a program).

When the PSM task selection panel is displayed on the screen, you can select each one of the options and make sure everything works.

Suggestions for Improving the PSM Dialog

Now that you've had some practice writing an ISPF dialog, you might want to try to make some of these improvements to the PSM dialog.

- Add more error-checking capabilities and confirmation messages.
- Print or display a monthly list of activities.
- Modify the PSM SKELS file tailoring skeleton to include the time field.
- If you have a color terminal, add some color to the PSM panels.
- For a challenge, create a table display panel that allows you to add rows to the table.

Adding the Dialog to the ISPF Master Application Menu

To add the PSM dialog to the ISPF Master Application Menu, you must first make a copy of its panel definition. That file is either in ISPF's panel library, ISPLLIB MACLIB, as member ISP@MSTR, or it is a CMS file named ISP@MSTR PANELS. (Its name depends on whether the ISPF and ISPF/PDF product files were specified as MACLIBs or as CMS files when the products were installed.)

Use the Move/Copy Utility, ISPF/PDF Option 3.3, to put the copy in a CMS file called ISP@MSTR PANELS A. (If you don't recall how to use Option 3.3, look back at the **Helpful Hint** on page 4-15.)

Next, edit the ISP@MSTR PANELS A file. You have to insert two lines in the panel definition:

1. In the)BODY section, add a line to make PSM a selectable option.
2. In the)PROC section, add a line to invoke the PSM dialog.

Use Dialog Test Option 7.2 to make sure the panel displays properly.

```
----- ISPF MASTER APPLICATION MENU -----  
OPTION  ===> _  
  
1 SAMPLE1 - Sample application 1  
2 PSM     - Personal Scheduling Manager  
3 .       - (Description for option 3)  
4 .       - (Description for option 4)  
5 .       - (Description for option 5)  
X EXIT    - Terminate ISPF using list/log defaults.
```

Enter END command to terminate ISPF.

```
USERID - JUDITH  
TIME   - 16:39  
TERMINAL - 3278  
PF KEYS - 24
```

Invoking ISPF to Run a Dialog

After your terminal displays the CMS "Ready" message (R;), type:

```
ISPSTART
```

(or whatever command your organization uses) on the CMS command line.

Because you typed only the ISPSTART command, with no parameters, the ISPF Master Application Menu appears on the screen. When you want to run a dialog, select it from among the ones listed on the panel by typing the dialog's option number on the command line.

If you know which dialog you want to run, and you don't need to look at the ISPF Master Application Menu, you can add keywords to the ISPSTART command. To do it this way, you have to know whether the dialog begins with either a selection panel or a function (a command procedure or a program), so you can specify the correct keywords.

For example, if the first thing the dialog's processing does is display a panel, type:

```
ISPSTART PANEL(panel-name) [OPT(option)]
```

If the dialog begins with a function that is written as a command procedure, type:

```
ISPSTART CMD(command-procedure-name)
```

If the dialog begins with a function that is written in a high-level programming language, type:

```
ISPSTART PGM(program-name) [PARM(parameters)]
```

The PSM dialog begins with a selection panel, so you type:

```
ISPSTART PANEL(PSM)
```

Re-coding the Functions as Programs

You can re-code the PSM dialog functions from REXX to a programming language such as COBOL, Pascal, PL/I, or FORTRAN.

Whether you use command procedure languages or high-level programming languages for your functions depends on what kind of application you are writing, and whether it has to run on other operating systems (MVS or VSE).

Command procedures work well for applications with simple processing, a small number of input/output operations, and limited arithmetic manipulation. They take less time to develop than programs do, so you can quickly create rough outlines of the application's processing, and refine things as you go along. Command procedure languages are specific to the operating system, so you can't transfer them to another operating system.

Programming languages are better suited for applications with extensive input/output processing and arithmetic manipulation, or special input validation processing. They execute faster than command procedures do, but they take longer to develop. And, of course, programming languages work across operating systems.

You can use ISPF/PDF's Option 4, FOREGROUND, or Option 5, BATCH, to compile programs. The Foreground Selection Panel presents the following choices:

```
----- FOREGROUND SELECTION PANEL -----
OPTION ==> _

  1 - System assembler           7 - Linkage editor
  2 - OS/VS COBOL compiler      8 - Load
  3 - VS FORTRAN compiler       9 - SCRIPT/VS
  4 - PL/I checkout compiler    10 - COBOL interactive debug
  5 - PL/I optimizing compiler  11 - FORTRAN interactive debug
  6 - PASCAL/VS compiler        12 - Member parts list

SOURCE DATA PACKED ==>      (YES or NO)
```

Suppose you select COBOL. The next panel you see is the Foreground COBOL Compile panel. Enter the name of your COBOL program like this:

```
----- FOREGROUND COBOL COMPILE -----
COMMAND ==>

ISPF LIBRARY:
PROJECT ==>
GROUP   ==>           ==>           ==>           ==>
TYPE    ==>           (Blank for member selection list)
MEMBER  ==>

CMS FILE:
FILE ID ==> psmxent cobol a_
IF NOT LINKED, SPECIFY:
OWNER'S ID ==>           DEVICE ADDR. ==>           LINK ACCESS MODE ==>

READ PASSWORD ==>           UPDATE PASSWORD ==>

COMPILER OPTIONS::
TEST    ==>           (TEST or NOTEST)
OTHER   ==>

ADDITIONAL CONCATENATED MACLIBS:
==>           ==>           ==>           ==>
```

Press the ENTER key. When foreground processing is complete, you see a "MORE..." message in the lower right corner of the screen. If the foreground processor generated an output listing, the listing file is displayed automatically in Browse mode. After you review the Browse output, press PF3.

On the next panel, specify the foreground print options you want to use.

```
----- FOREGROUND PRINT OPTIONS -----
OPTION ----> _

PK - Print file and keep           K - Keep file (without printing)
PD - Print file and delete         D - Delete (erase) file (without printing)

If END command is entered, file is kept without printing.

FILE ID:

SPOOL OPTIONS:
NUMBER OF COPIES ---->           SPOOL CLASS ---->
BIN NUMBER          ---->         'FOR' USER  ---->
3800 KEYWORDS       ---->

FOR SPOOLING TO ANOTHER USER OR MACHINE:
USER/MACHINE ID    ---->
NODE/LINK ID       ---->
TAG TEXT           ---->
```

To use batch processing, select the appropriate language from the list of choices on the Batch Selection Panel:

```
----- BATCH SELECTION PANEL -----
OPTION ====> _

  1 - System assembler           6 - PASCAL/VS compiler
  2 - OS/VS COBOL compiler      7 - Linkage editor
  3 - VS FORTRAN compiler      8 - Load
  4 - PL/I checkout compiler   12 - Member parts list
  5 - PL/I optimizing compiler

SOURCE DATA PACKED ====>          (YES or NO)

BATCH JOB INFORMATION: (Verify before proceeding)
  (Your CMS user id automatically becomes your batch job user id.)

BATCH MACHINE ID   ====>

JOB STATEMENT INFORMATION:
  ACCOUNT NUMBER   ====>
  JOB NAME         ====>

YOUR A-DISK READ PASSWORD:
  ====>
```

If you select Option 5, PL/I optimizing compiler, the following panel appears. Enter the name of the file to be compiled, using a filetype of PLI or PLIOPT.

```
----- BATCH PL/I OPTIMIZING COMPILE -----
COMMAND ==>

ISPF LIBRARY:
PROJECT ==>
GROUP   ==>           ==>           ==>           ==>
TYPE    ==>
MEMBER  ==>           (Blank for member selection list)

CMS FILE:
FILE ID ==> psmxent pliopt a_
IF NOT LINKED IN YOUR LOGON DIRECTORY, SPECIFY:
OWNER'S ID ==>           DEVICE ADDR. ==>           LINK ACCESS MODE ==>

READ PASSWORD ==>

COMPILER OPTIONS:
==>

ADDITIONAL CONCATENATED MACLIBS:
==>           ==>           ==>           ==>
```

For more information on the Foreground and Batch options, refer to *ISPF/PDF Guide*.

Congratulations! You've just written your first ISPF dialog. We hope you found this *Primer* helpful and interesting. And we hope it has encouraged you to learn more about ISPF and ISPF/PDF.

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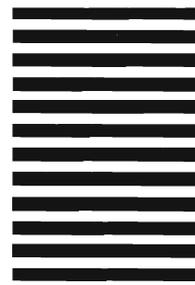
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