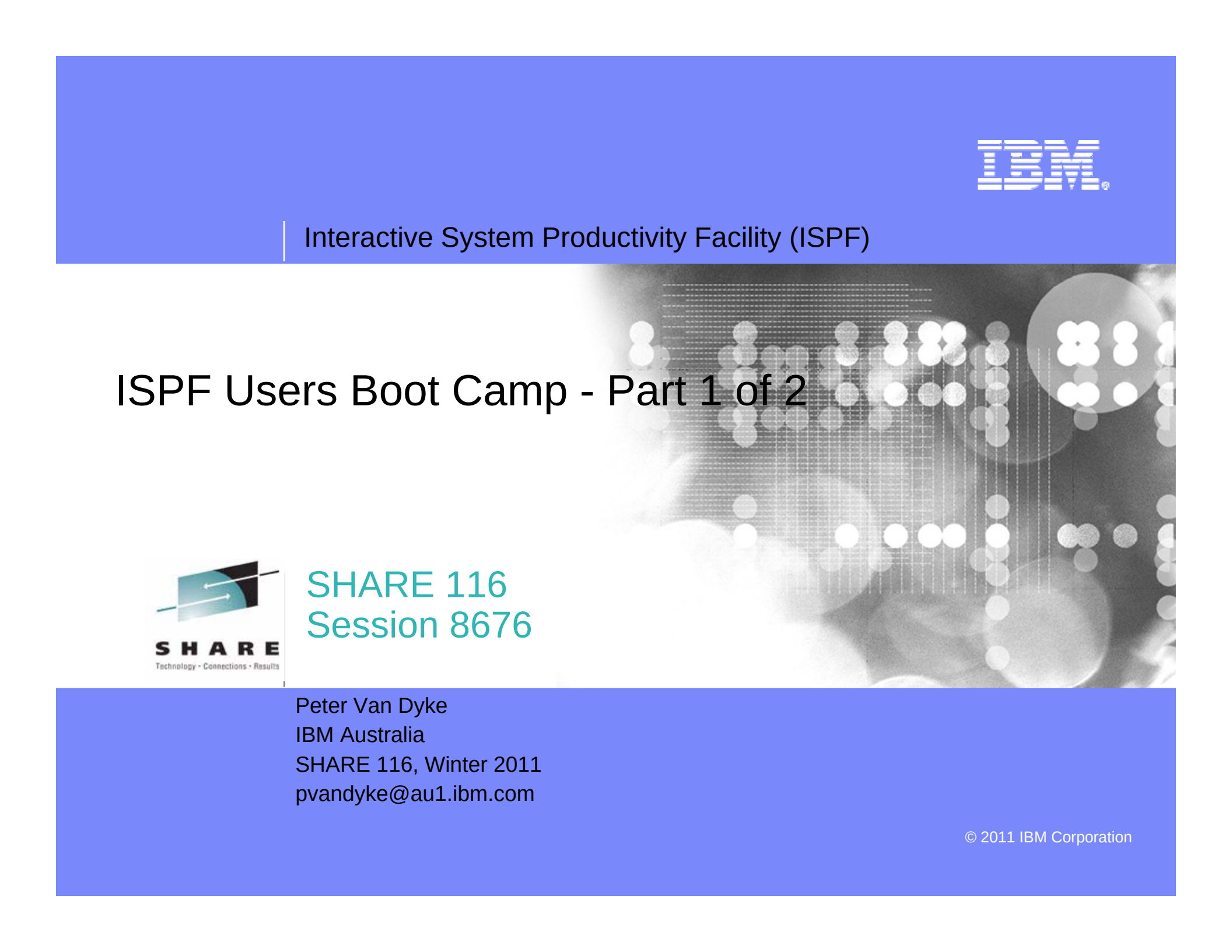

Interactive System Productivity Facility (ISPF)

ISPF Users Boot Camp - Part 1 of 2

SHARE 116
Session 8676

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Agenda

- **Overview**
  - What is ISPF?
  - Components of ISPF?
- **The ISPF user interface**
  - Starting ISPF
  - Primary Option Menu
  - Panel format
  - Navigating in ISPF
  - Using commands and function keys
  - Getting help
  - Split screen mode
  - Ending ISPF

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Agenda…

- **ISPF Primary Options**
  - Settings – change the look and feel of ISPF
  - View – look at data without changing it
  - Edit – update and create data
  - Utilities – perform system utility and data set management functions
  - Others
    - Command, Foreground, Batch, Dialog Test, IBM Products, SCLM, Workplace
- **How to learn more**

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What is ISPF?

- **Interactive System Productivity Facility**
  - A set of panels, functions, and utilities that help you:
    - Manage data stored in z/OS data sets
    - Develop interactive applications called *dialogs*
  - An extension to TSO/E (Time Sharing Option of z/OS)
  - Provides services that complement those provided by TSO/E
  - Provides services to dialogs (applications) during their execution

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ISPF is a multifaceted development tool set for the z/OS operating system. Since 1975, MVS programmers have used ISPF for host-based application development productivity. ISPF forms the basis of many TSO applications and provides extensive programmer oriented facilities as well.

TSO/E is a base element of the z/OS operating system that allows you to interactively work with the system. It is a tool with which you can:

- Develop and maintain programs in languages such as assembler, COBOL, FORTRAN, PASCAL, PL/I, REXX, and CLIST
- Process data
- Access the MVS operating system
- Communicate with other TSO/E users
- Create an office environment

ISPF can be seen as an extension to TSO/E. ISPF runs under TSO/E, and sometimes the acronym TSO/ISPF is used to describe the facility provided by these closely associated subsystems. The services provided by ISPF complement those of the host TSO/E system to provide full-screen interactive processing.

ISPF is similar to a control program or access method in that it provides services to dialogs (applications) during their execution. A dialog is the interaction between a person and a computer. It helps a person who is using an interactive display terminal to exchange information with a computer.

Components of ISPF

- **Dialog Manager**
  - ↓Provides services to dialogs and end users.
  - ↓Composed of six elements:
    - Functions
    - Panels
    - Messages
    - Tables
    - File tailoring skeletons
    - Dialog variables

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Notes for slide 5

Dialog Manager provides services to dialogs and end-users. A *dialog* is the interaction between a person and a computer. It helps a person who is using an interactive display terminal to exchange information with a computer. The user starts an interactive application through an interface that the system provides. The dialog with the user begins with the computer displaying a panel and asking for user interaction. It ends when the task for which the interactions were initiated is completed. Dialog Manager is composed of six elements:

Functions: A function is a command procedure or a program that performs processing requested by the user. It can invoke ISPF dialog services to display panels and messages, build and maintain tables, generate output data sets, and control operational modes. They can be written as:

- REXX or CLIST command procedures
- Programs

Panel definitions: A panel definition is a programmed description of the panel. It defines both the content and format of a panel. Most panels prompt the user for input. The user's response can identify which path is to be taken through the dialog, as on a selection panel. The response can be interpreted as data, as on a data-entry panel.
Message definitions: Message definitions specify the format and text of messages to users. A message can confirm that a user-requested action is in progress or completed, or it can report an error in the user's input.
Table: Tables are two-dimensional arrays that contain data and are created by dialog processing. They can be created as a temporary data repository, or they can be retained across sessions. A retained table can also be shared among several applications. The type and amount of data stored in a table depends on the nature of the application.
File tailoring skeletons: Skeletons work like a fill-in-the-blank exercise. They take dialog variables and put them into a data set containing statements that control the output format. The output data set can be used to drive other processes. File skeletons are frequently used to produce job data sets for batch execution.
Dialog variables: ISPF services use variables to communicate information among the various elements of a dialog application. ISPF provides a group of services for variable management. Variables can vary in length from zero to 32K bytes.

Dialog Manager 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, or
- screens to be formatted.

It can verify, process, and store input, and it can create output. ISPF can also function as a simplified data management system for small amounts of data stored in tables.

Dialog Manager also provides library access services that help you perform system utility functions on ISPF libraries or data sets. An edit recovery service helps you recover the changes you made to a data set before a system failure. The edit interface and browse interface services allow you to provide I/O to edit or browse data that is not in either a sequential or a partitioned data set (PDS).

Components of ISPF…

- **Program Development Facility (PDF)**
  - ↓Provides services to assist the dialog or application developer.
  - ↓Includes services such as:
    - EDIT
    - BROWSE
    - VIEW
  - ↓Includes utilities to:
    - Display and print library and data set member lists
    - Compare data sets and search for strings of data
    - Move, copy, and print library and data set members

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Notes for slide 6

ISPF Program Development Facility (PDF) provides services to assist the dialog or application developer. These include the edit and browse functions, data set and catalog utilities, TSO command interfaces, and library access services that can be combined in a dialog with any of the ISPF services. The library access services carry out functions involving members of a programming library. These functions include adding, finding, and deleting members, and displaying member lists.

PDF component services consist of BRIF (Browse Interface), BROWSE, EDIF (Edit Interface), EDIREC (edit recovery for EDIF), EDIT, VIEW, VIIF, and EDREC (edit recovery for EDIT and VIEW), along with the library access services.

BRIF Provides browse functions for data accessed through dialog-supplied I/O routines. It allows you to browse data other than partitioned data sets or sequential files, such as subsystem data and in-storage data, and to preprocess the data being browsed.

BROWSE Can be used to look at any ISPF library, concatenation of ISPF libraries, or data set that can be allocated by using the LMINIT service, and certain other data types not supported by ISPF. You can browse host data sets on the workstation or workstation files on the host.

EDIF Provides edit functions for data accessed through dialog-supplied I/O routines. It allows you to edit data other than partitioned data sets or sequential files, such as subsystem data and in-storage data, and to preprocess the data being browsed.

EDIREC Initializes an edit recovery table (ISREIRT) for use by the EDIF service and determines whether recovery from the EDIF service is pending.

EDIT Can be used to look at any ISPF library, concatenation of ISPF libraries, or data set that can be allocated by using the LMINIT service. The EDIT service provides an interface to the PDF editor and bypasses the display of the Edit Entry Panel on the host. You can also edit host files on the workstation or workstation files on the host.

EDREC Initializes an edit or view recovery table, determines whether recovery is pending, and takes the action specified by the first argument.

VIEW Functions exactly like the EDIT service, with the following exceptions:

- You must use the REPLACE or CREATE primary command to save data.
- When you enter the END primary command after altering a file in VIEW mode, you will be prompted to either save the changes or exit without saving them.

VIIF Provides edit functions for data accessed through dialog-supplied I/O routines. It enables you to view data other than partitioned data sets or sequential files, such as subsystem data and in-storage data, and to preprocess the data being viewed.

Components of ISPF…

- **Software Configuration Library Manager (SCLM)**
  - Consists of two functional components:
    - Library Manager – used to manage source code
    - Configuration Manager – used to track all of the software components of an application, and how they fit together.
  - SCLM-managed data stored and maintained in ISPF libraries (PDS)
  - Used in the development of z/OS-based applications that employ traditional languages such as COBOL and PL/I
  - Can be used in conjunction with SCLM Developer Toolkit for the development of Java/J2EE applications.

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Software Configuration Library Manager (SCLM) is a software tool that helps you develop complex software applications. Throughout the development cycle, SCLM automatically controls, maintains, and tracks all of the software components of the application. You can lock the version being edited in a private library and then promote it. Use SCLM to create, control, maintain, and track software components for a project.

SCLM provides Library Management capabilities used to manage source code, such as for the Versioning and Auditing of changes, and Promotion which moves source from one set of staging libraries to the next.

SCLM provides Configuration Management capabilities, to track how all of the pieces of an application fit together - not just source, but objects, loads, test cases, documentation and other items. The Build function tracks and invokes the necessary compilers, assemblers and linkage editors.

SCLM-managed data is maintained and controlled on z/OS. The SCLM project database consists of a series of related ISPF libraries (partitioned data sets). These contain source and non-source software components. SCLM project definition and control information is contained in an assembled and linked PROJDEFS data set. SCLM project cross-reference and accounting data sets are VSAM clusters.

Components of ISPF…

- **Client/Server – Workstation Agent (WSA) Component**
  - ↓Enables you to run ISPF on a programmable workstation
  - ↓Provides distributed editing for:
    - Editing host files on the workstation
    - Editing workstation files on the host
  - ↓Dialogs can use GUI functions such as:
    - Push buttons
    - Check boxes
    - Screen resizing
    - GIF images

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The Client/Server component, also known as the ISPF Workstation Agent (WSA) allows the users of ISPF applications to use a workstation running Windows or UNIX to display the panels of an ISPF application. It does this using the Graphical User Interface of the workstation. Because of this, there is no requirement to change your existing ISPF applications to run in a GUI environment.

Workstations can communicate with the host using either Transmission Control Protocol/Internet Protocol (TCP/IP) or Advanced Program-to-Program Communications (APPC). Functional enhancements to ISPF allow application developers to improve the appearance of the display on the GUI device.

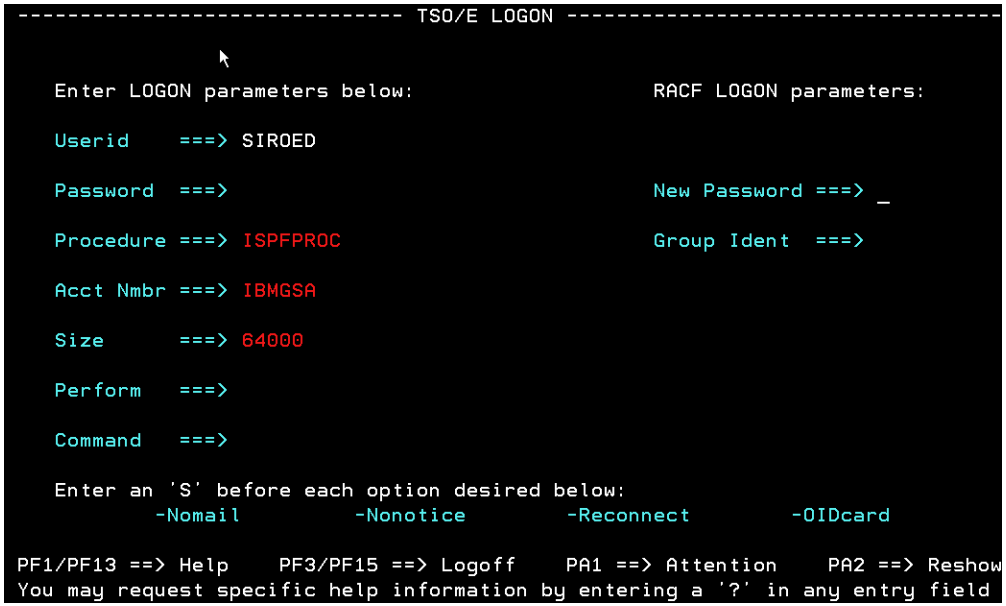
Supported functions include:

- Push buttons
- Check boxes
- Action bars
- Mnemonics
- Unavailable choices
- Title bars
- Screen resizing

The WSA also allows you to edit host data on your workstation and workstation data on the host. In ISPF this is called *distributed editing*.

Starting ISPF

- Log on to TSO



- When the READY prompt appears, type ISPF or PDF and press Enter

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To start ISPF:

- Log on to TSO.
  When the READY prompt appears, type ISPF or PDF and press Enter.
- If your installation has established an alias for ISPF, such as SPF, you can enter that instead.

The ISPF and PDF commands are aliases of ISPF module ISRPCP. When you run ISRPCP or one of its aliases with no parameters, ISPF is started through this command:

ISPSTART PANEL(default_primary_panel) NEWAPPL(ISR)

The default primary panel is usually ISR@PRIM, the ISPF Primary Option Menu .

You can specify any of the ISPSTART parameters when invoking ISPF, PDF, or ISRPCP. However, if you do this you must ensure that you specify *all* the parameters that ISPSTART needs to run your application in the correct environment. This is because only those parameters you specify are passed to ISPSTART. For example, if you specify:

ISPF NEWAPPL(ABC)

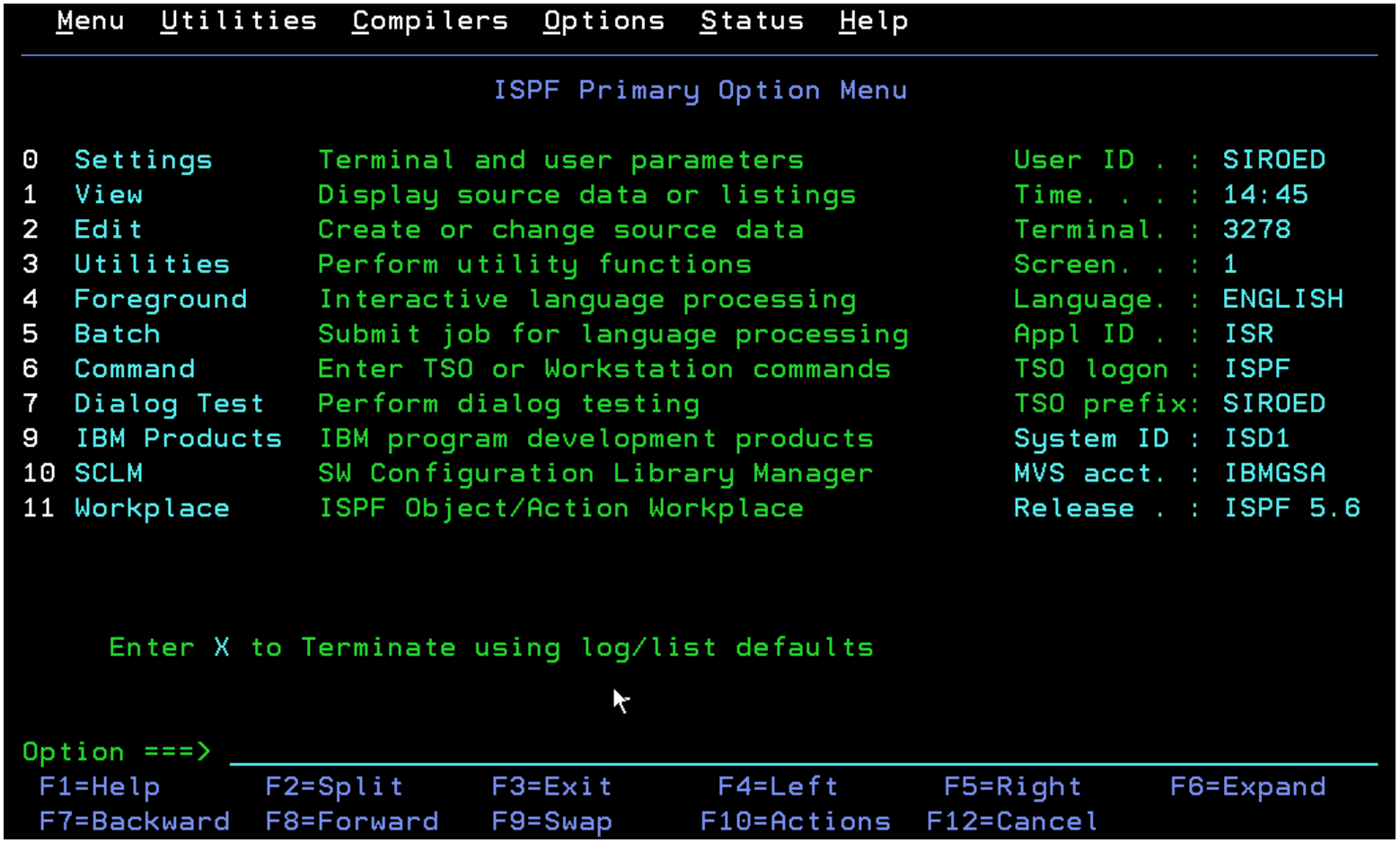
ISPF is invoked with this command:

ISPSTART NEWAPPL(ABC)

Note that in this case ISPF does not pass PANEL(ISR@PRIM), part of its normal default string, to ISPSTART. Because the ISPSTART command generated does not contain a PANEL(...), PGM(...) or CMD(...) keyword, there is no primary panel to display.

Primary Option Menu

The Primary Option Menu panel is the first panel you see when you start ISPF



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The ISPF Primary Option Menu panel is the first panel that displays when you start ISPF. If your installation has a customized ISPF Primary Option Menu, the menu might not contain all of options shown here, or it might contain certain installation-specific options.

The options available on the default ISPF Primary Option Menu are:

0 Settings	displays and changes selected ISPF parameters, such as terminal characteristics and function keys.
1 **View**	displays data using the View or Browse function. You can use View or Browse to look at (but not change) large data sets.
2 Edit	allows you to create or change source data such as program code and documentation using the ISPF full-screen editor.
3 Utilities	perform library and data set maintenance tasks, such as moving or copying library or data set members, displaying or printing data set names and volume table of contents (VTOC) information, comparing data sets, and searching for strings of data.
4 **Foreground**	calls IBM language processing programs in the foreground.
5 Batch	calls IBM language processing programs as batch jobs. ISPF generates Job Control Language (JCL) based on information you enter and submits the job for processing.
6 Command	calls TSO commands, CLISTs, or REXX EXECs under ISPF.
7 Dialog Test	tests individual ISPF dialog components, such as panels, messages, and dialog functions (programs, commands, menus).
9 **IBM Products**	allows you to select other installed IBM program development products on your system.
10 SCLM	controls, maintains, and tracks all of the software components of an application.
1**1 Workplace**	gives you access to the ISPF Workplace, which combines many of the ISPF functions onto one object-action panel.
X EXIT	leaves ISPF using the log and list defaults.

Panel format

- A panel is a predefined display image that you see on a display screen
- ISPF formats all panels to fit on a 24-line by 80-character screen
- ISPF has three basic types of panels:
  - Menus (selection panels)
  - Data-entry panels
  - Scrollable data panels

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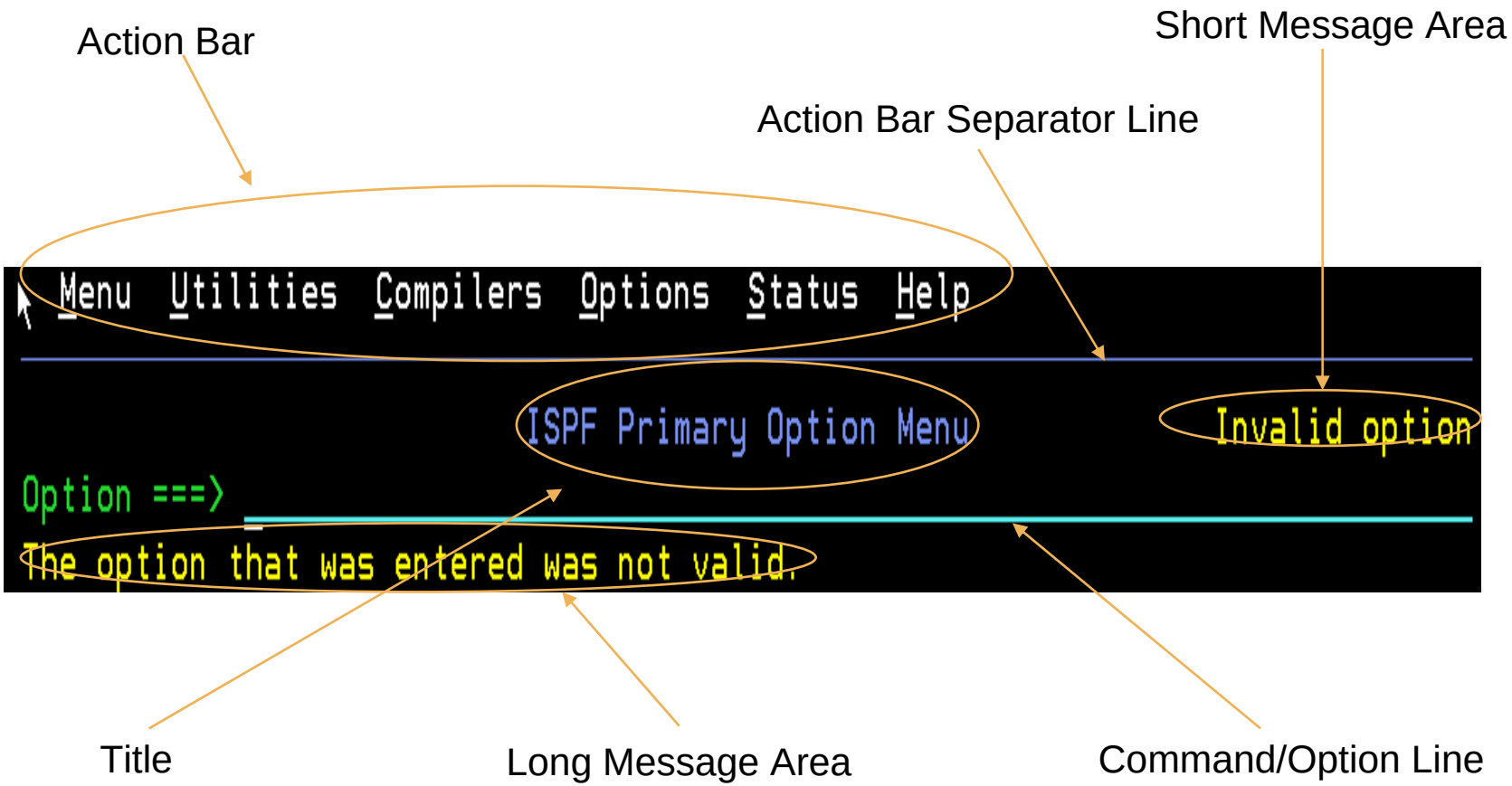
A *panel* is a predefined display image that you see on a display screen. ISPF formats all panels to fit on a 24-line by 80-character screen. On a 3278 Model 3 or 4, data that you can scroll occupies the full length of the screen (32 or 43 lines). On a 3278 Model 5, ISPF normally displays information in *default mode*; that is, 24 lines by 80 characters, with the same size characters as other models. "Browse" and "Edit" data that is wider than 80 characters is displayed with the smaller *native mode* characters, that is, up to 132 per line. You can use the Settings option (0) to override the automatic switching of modes.

When using ISPF, you see three basic types of panels:

- Menus (selection panels)
- Data-entry panels
- Scrollable data displays.

Panel format …

If the command/option line is positioned at the top of the screen, the first lines of the panel are generally formatted as shown:



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The Action Bar area (line 1) contains action bar choices that may be selected by positioning the cursor on the action bar choice and pressing Enter. A pull-down menu will then appear. Action bars give you one way to move through ISPF. Most ISPF panels have action bars at the top; the choices appear on the screen in white by default.

The Action Bar Separator area (line 2) is a visual divider between the action bar and the rest of the panel.

The Title area (line 3) identifies the function being performed and, where appropriate, library or data set information.

The Short Message area (line 3) is used to indicate:

- Current line (browse) and column positions (browse, view and edit)
- Current row position in table display
- Successful completion of a processing function
- Error conditions (can be accompanied by audible alarm)

The Command/Option line may appear next (line 4) or near the bottom of the panel. The command line is used to enter a command. On a menu (selection panel), it may be used to enter either a command or an option.

The Long Message area displays an explanation of error conditions when you enter the HELP command.

Panel format …

And the last lines of the panel generally display the function keys:

Function Keys

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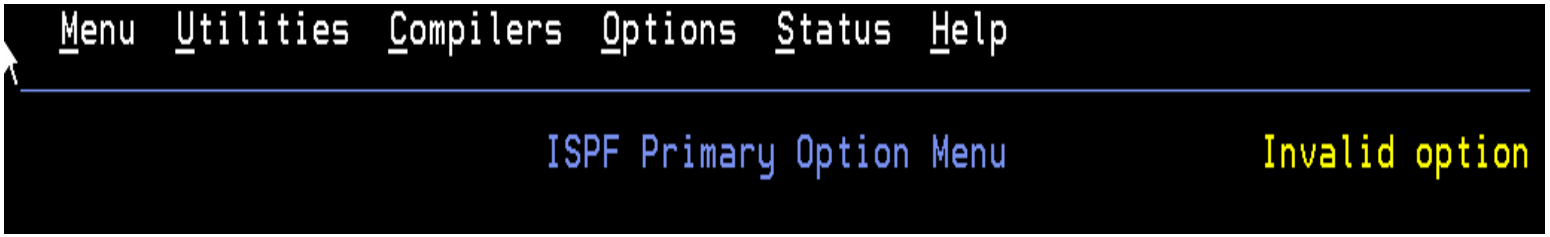
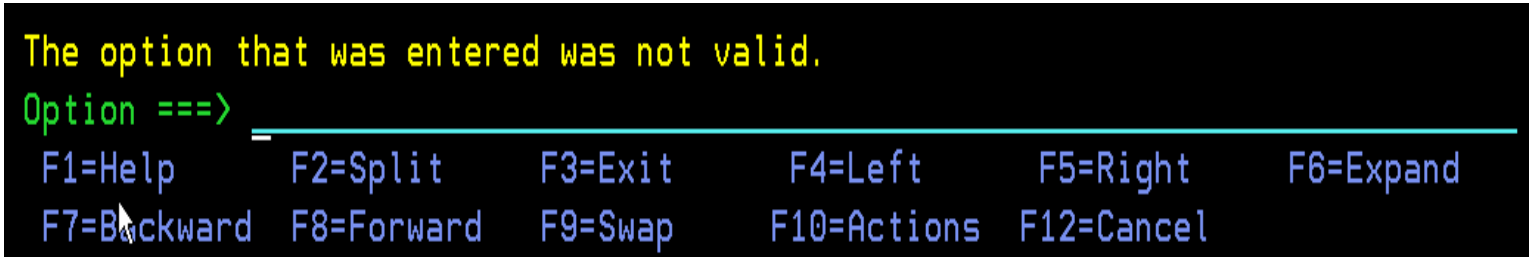
The Function Keys area displays settings for the function keys. These settings are controlled through the Function keys pull-down on the action bar on the ISPF Settings panel.

Panel format …

But, if the command/option line is positioned at the bottom of the screen, the first lines of the screen are generally formatted as shown:



And the last lines are generally formatted like this:



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The position of the command line and the long message area is controlled by the ISPF parameters on the ISPF Settings panel.

Command line at bottom

Specifies that the command line is to appear at the bottom of each logical screen. If you have specified that the panel should be displayed in CUA mode, the command line placement defaults to the bottom. If you deselect this field, the command line appears as specified in the panel definition statements. Unless indicated in the panel definition, it appears at the top of the panel. When you select the Command line at bottom option, the following changes take place:

- The command line moves to the last line of the logical screen or the line above the function keys depending on the CUA mode setting.
- Each line that follows the command line shifts up one line.
- The long message overlays the line above the new command line location.

Panel display CUA mode

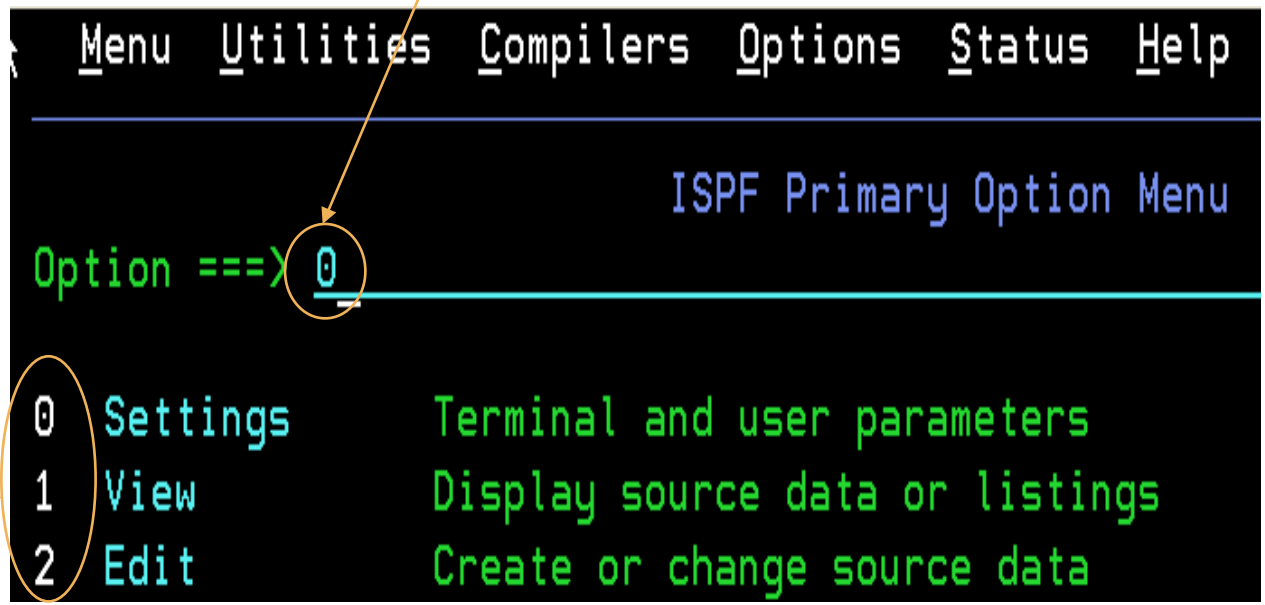
Specifies that panels be displayed in CUA mode. This selection also affects how the long message line, command line, and function keys are displayed.

Panel format - menus

A menu, or selection panel, allows you to type a number or letter in the Option field and press Enter to select one of the listed items.

This example shows the selection of option 0 (Settings) from the ISPF Primary Option menu.

Menu choices



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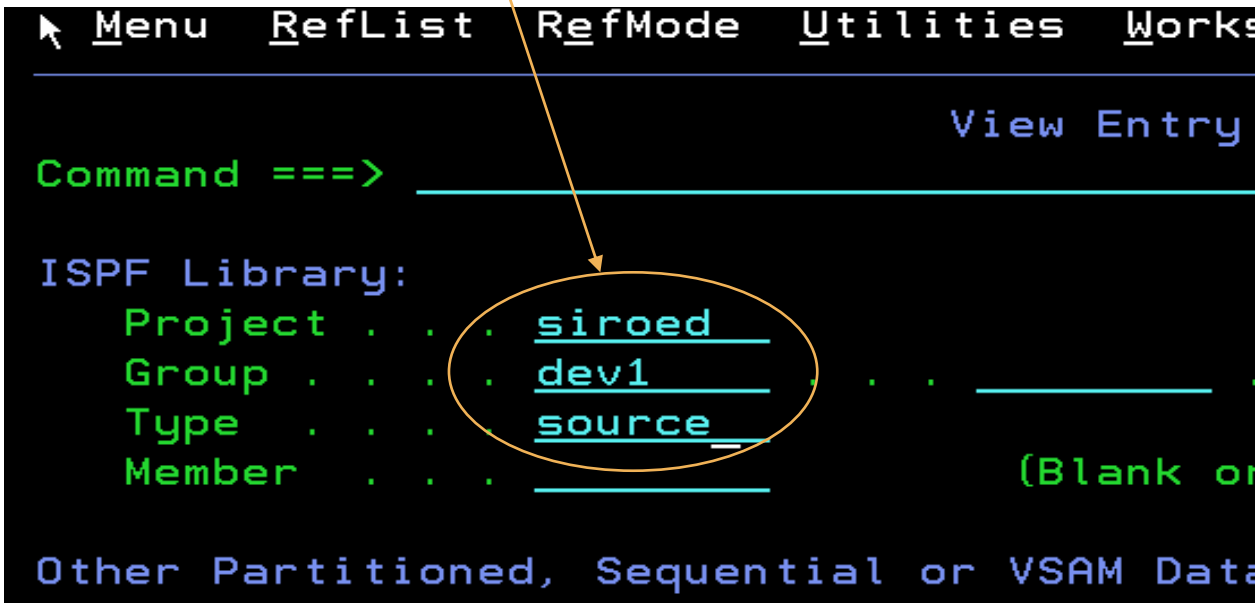
A menu, or selection panel, allows you to type a number or letter in the Option field and press Enter to select one of the listed items. The number or letter can be typed in either uppercase or lowercase. Allowable numbers and letters are shown in high intensity. You can also enter ISPF commands.

A typical dialog organization starts with display of the highest menu, called the primary option menu. User options selected from the primary option menu can result in the call of a function or the display of a lower-level menu. Each lower-level menu can also cause functions to receive control or still other menus to be displayed.

Panel format – data-entry panels

A data-entry panel is a panel on which you specify information.

This example shows the entry of ISPF library information in the View Entry panel.



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A data-entry panel is a panel on which you specify information, such as data set names, job statement parameters, and language processing options. If you do not enter a required value or if you enter inconsistent values, ISPF prompts you with a message.

Some data-entry fields retain their previous values. If so, the next time you use the panel, you do not have to type them again. Just press Enter. If you do not want those values, type over them and then press Enter.

The retained values come from your user profile, which ISPF automatically builds and maintains across sessions.

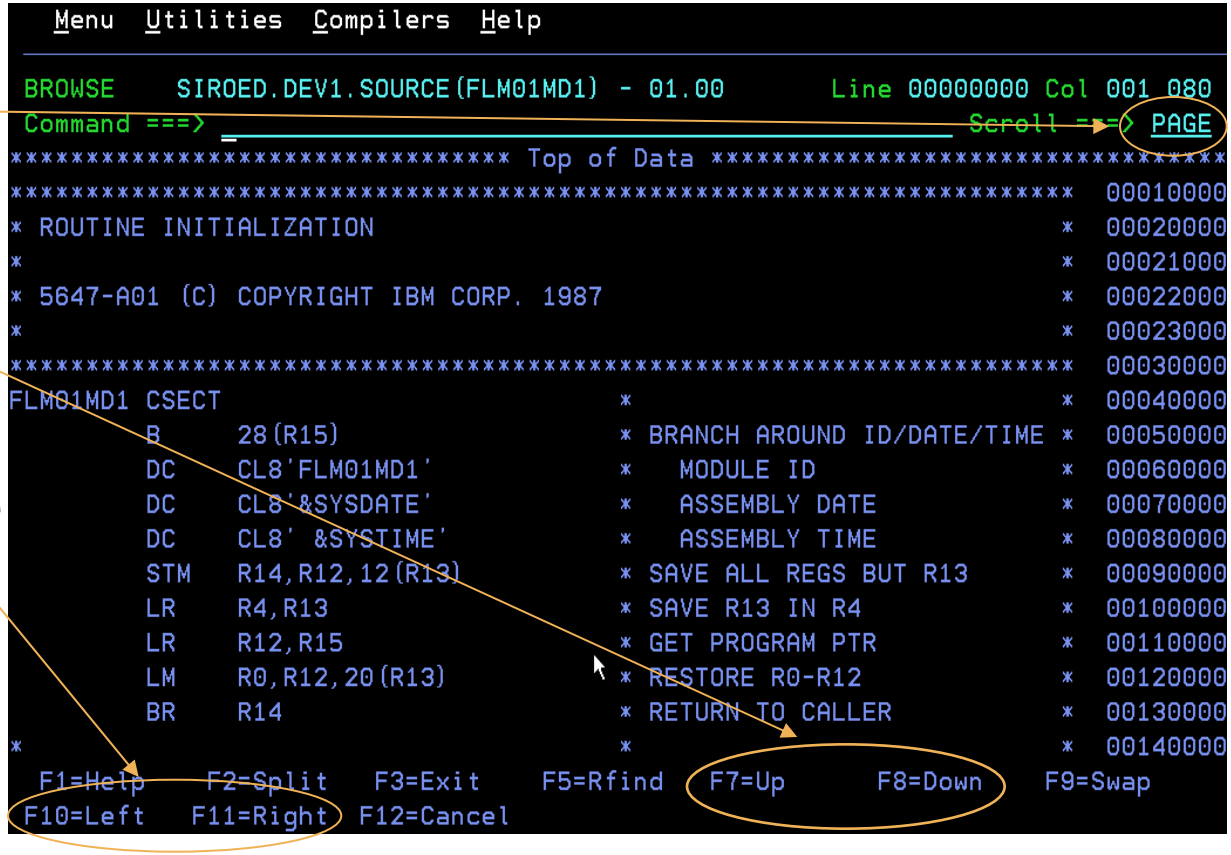
Panel format – scrollable data panels

Information is displayed in scrollable format when there is too much data to fit on the logical screen, as in this example of a Browse panel.

You control the scroll amount using the Scroll field.

You can use these scroll commands to scroll up and down.

And you can use these scroll commands to scroll left and right.



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Information is displayed in scrollable format when there is too much data to fit on the logical screen. You can scroll up and down or left and right using scroll commands. When scrolling is allowed, a scroll amount is commonly displayed at the top of the screen. This amount determines the number of lines, or columns, scrolled with each use of a scroll command. To change the scroll amount, move the cursor to the scroll field and type over the displayed amount. Valid scroll amounts are:

ZXSMIN-ZXSMAX
: The minimum and maximum scroll values. If you specify a scroll amount of **0**, no scrolling occurs.

PAGE Specifies scrolling by one page. For scrolling purposes, a *page* is defined as the amount of information currently visible on the logical screen.

DATA For up and down scrolling, specifies scrolling by one line less than a page. For left and right scrolling, it is one column less than a page.

HALF Specifies scrolling by half a page.

MAX Specifies scrolling to the top, bottom, left margin, right margin, beginning of field or end of field, depending upon which scrolling command is used and the current cursor position.

CSR Specifies scrolling based on the current position of the cursor. The line or column indicated by the cursor is moved to the top, bottom, left margin, or right margin of the screen, depending upon which scrolling command is used.

Navigating in ISPF

You can navigate (move around) in ISPF using the following methods:

- Using the command/option line
- Selecting a choice from one of the pull-downs on the action bar
- Selecting one of the point-and-shoot fields

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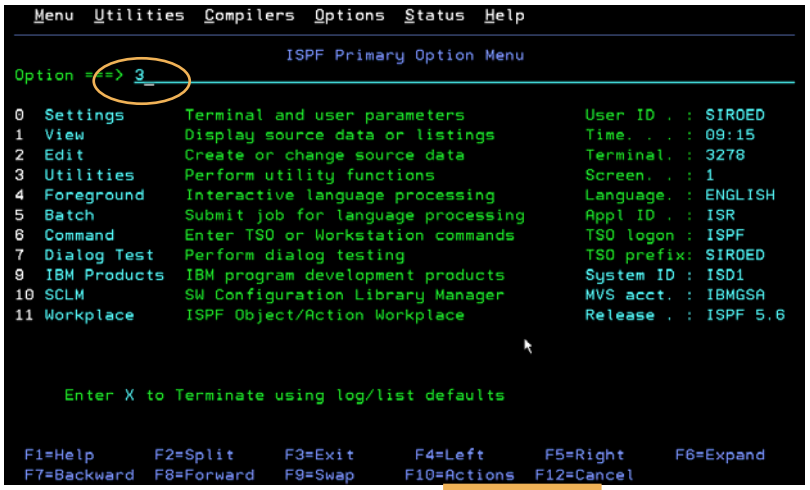
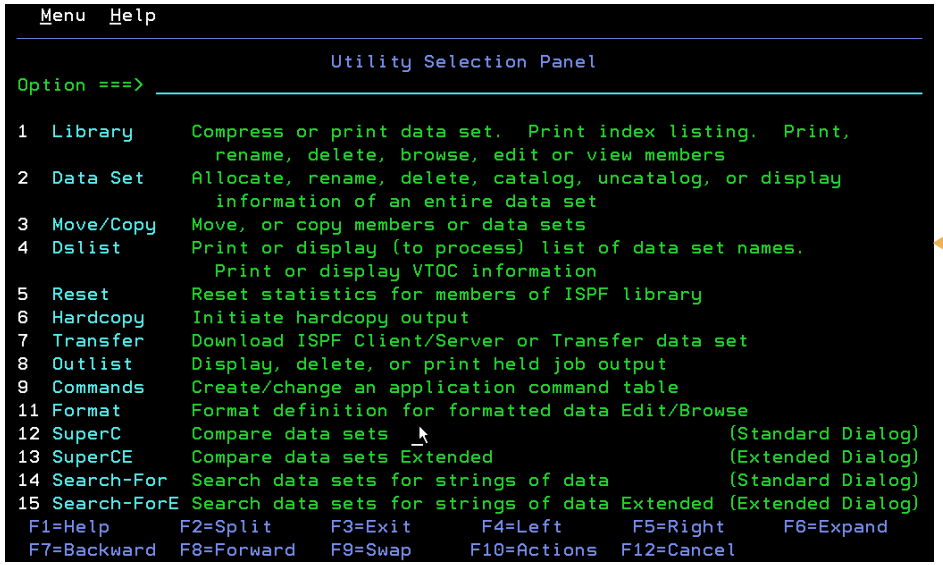
Navigating in ISPF – using the command/option line

From a menu you can type an option selection number or letter.

In this example, we're selecting the Utilities option.





The Utilities menu is displayed.

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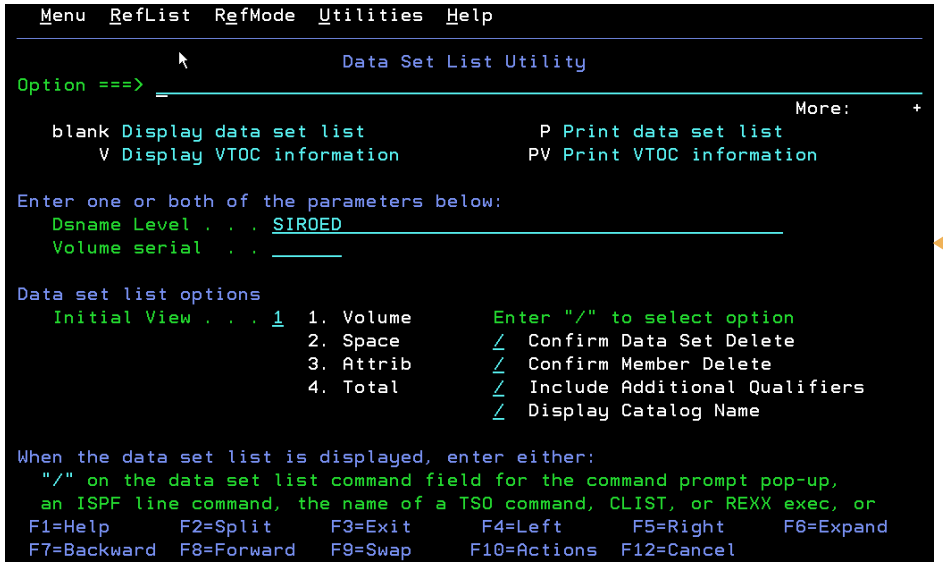
Navigating in ISPF – using the command/option line…

To bypass secondary option selections, type two selections separated by a period.

In this example, we're selecting option 4 from the Utilities menu.



The Data Set List Utility panel is displayed.

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Many options have a secondary list of options. To bypass the second menu, type two selections, separating them with a period, on the ISPF Primary Option Menu. For example, entering 3.4 on the ISPF Primary Option Menu is the same as entering 3 on the ISPF Primary Option Menu and 4 on the Utility Selection Panel.

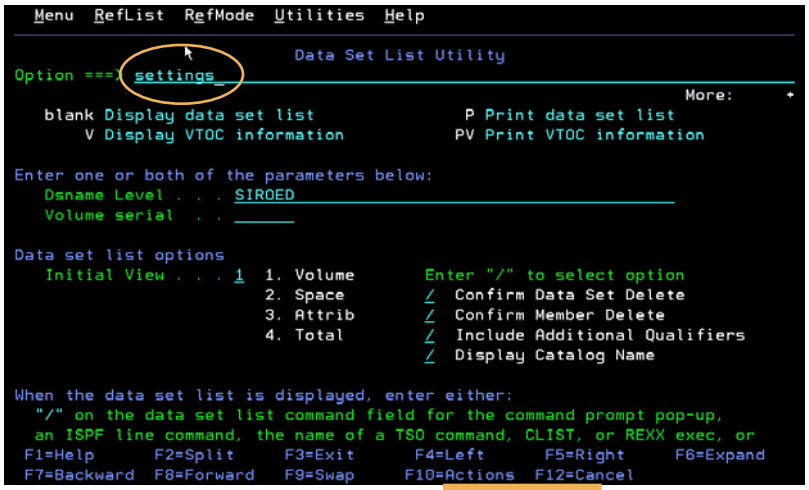
An even faster way to select an option is to bypass both the ISPF Primary Option Menu and the secondary menus. To do this, include your options in the ISPF (or alias) command. For example:

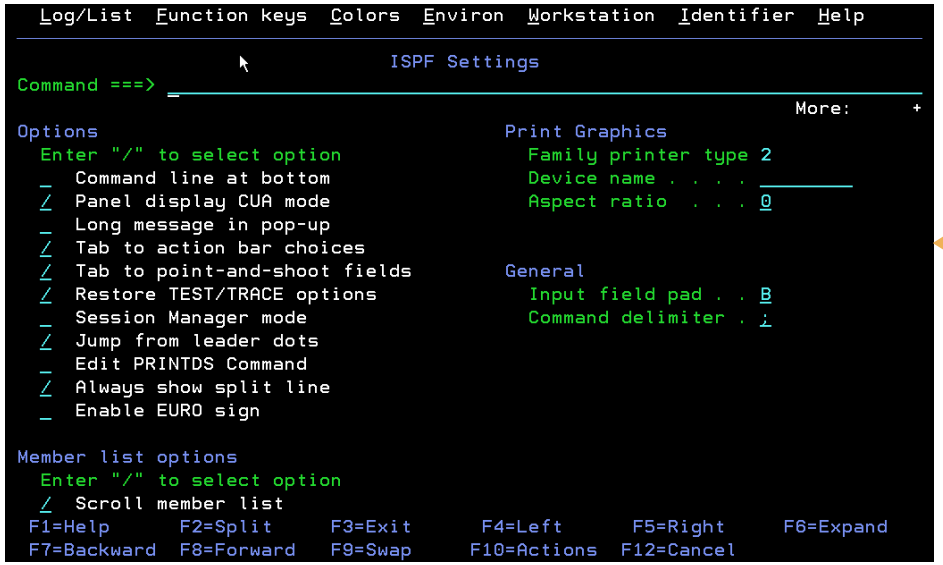
- **ISPF 2** To go directly to the Edit option.
- **ISPF 3.4** To go directly to the Data Set List utility (3.4).

Navigating in ISPF – using the command/option line…

From any panel, you can type an ISPF command on the command/option line.

In this example, we're entering the SETTINGS command.





The ISPF Settings panel is displayed.

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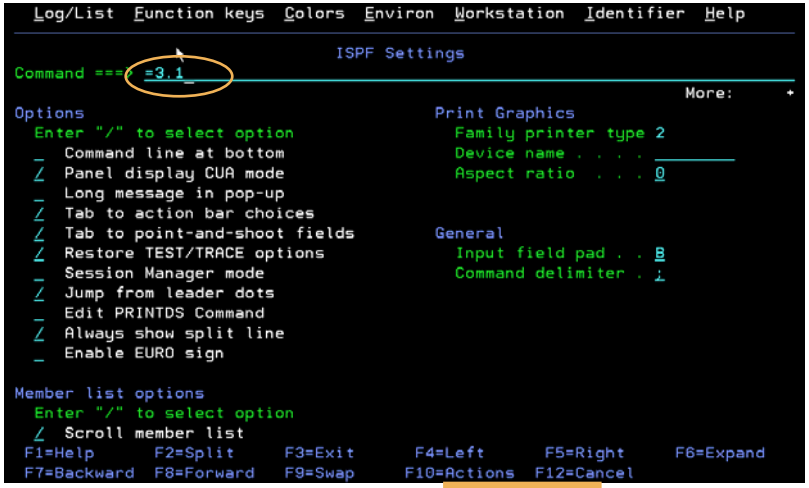
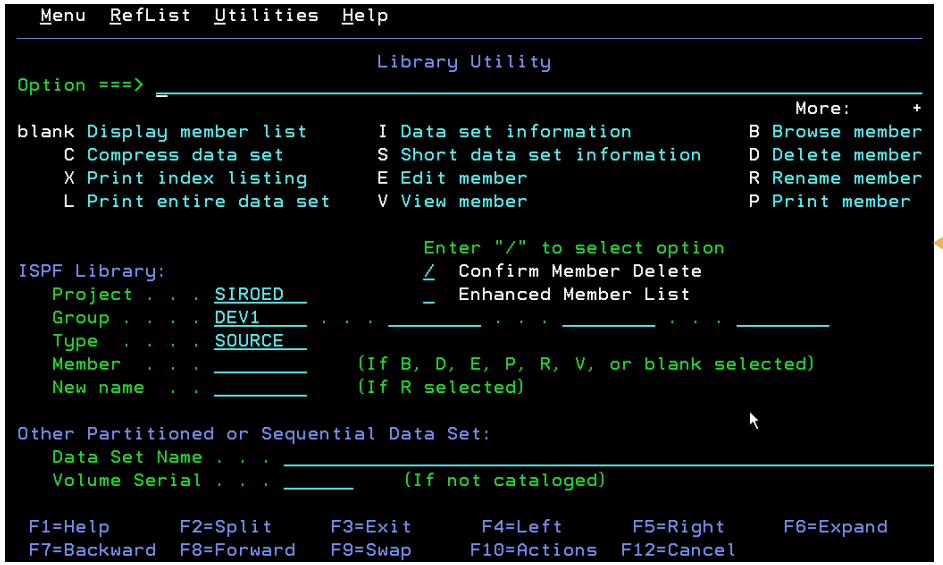
Navigating in ISPF – using the command/option line…

Use the jump (=) function to jump directly to any valid option from the primary option menu currently in effect.

Here we're jumping from the Settings panel to the Library Utility panel.





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Notes for slide 22

The jump function allows you to go directly to any valid option from the primary option menu currently in effect. To use the jump function, enter the option on the command line or in the command field of any panel, preceded by an equal sign and followed by a blank. For example: **Command ===> =3.1** takes you directly to the first suboption of option 3 on the primary option menu in effect.

The action is as follows:

- If not entered on a primary option menu, the jump function causes repeated END commands to be simulated until a primary option menu is encountered. What follows the equal sign is then used on the primary option menu, and pressing of the Enter key is simulated. The primary option menu is not displayed.

- If entered on a primary option menu, the jump function equal sign is ignored and the specified option is selected.

For convenience, you can enter a jump function in two other places:

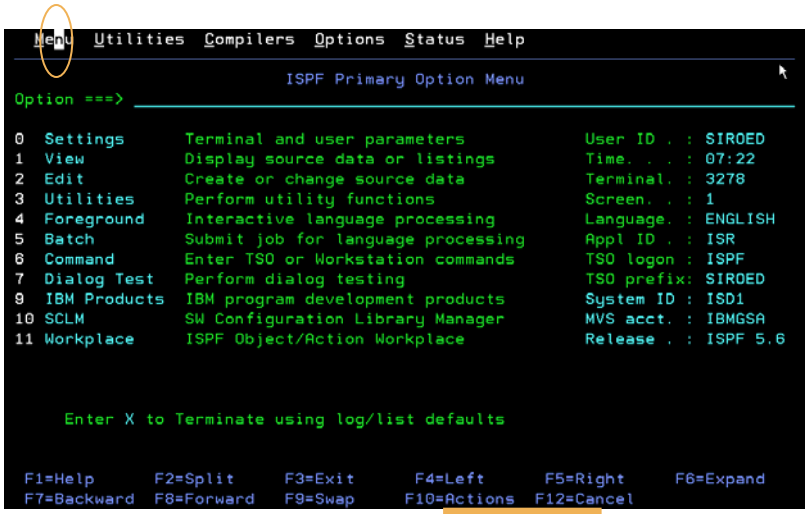
- Any field that is preceded by an arrow. The arrow must consist of at least two equal signs followed by a greater-than sign (**==>**). Also, the arrow must immediately precede the input attribute byte.

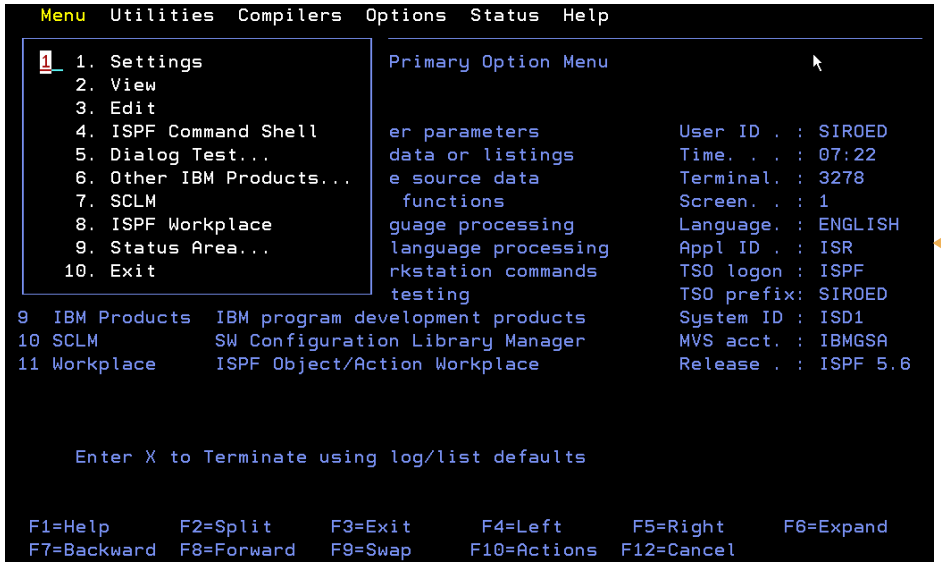
Any field preceded by leader dots (that is, ... or . .). ISPF looks at the three characters preceding the field; they must be either three consecutive dots or two dots separated by a blank.

Navigating in ISPF – using the action bar

The action bar provides another means of navigating.

When you position the cursor on an action bar choice and press enter, a pull-down menu is displayed. Enter the number of the pull-down choice you want.





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Notes for slide 23

Action bars provide another means of navigating in ISPF. An action bar is the area at the top of an ISPF panel that contains choices that give you access to actions available on that panel. When you select an action bar choice, ISPF displays a pull-down menu.

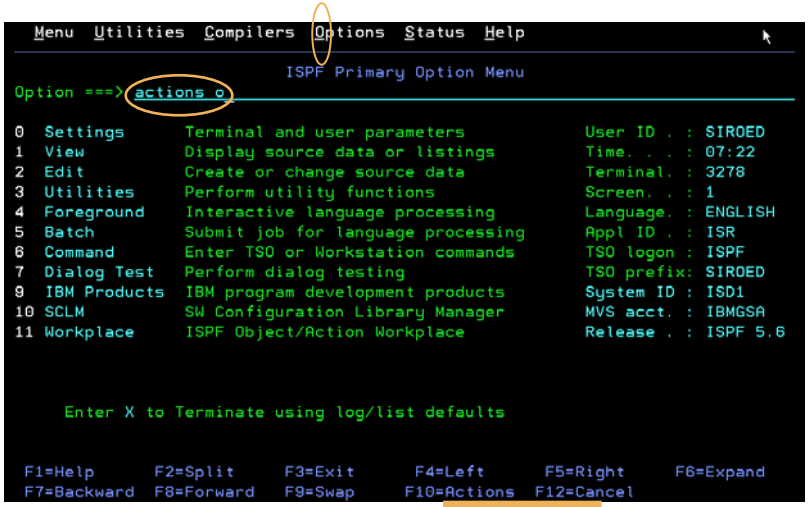
A pull-down menu is a list of numbered choices extending from the selection you made on the action bar. The action bar selection is highlighted. You can select an action either by typing in its number and pressing Enter or by selecting the action with your cursor. ISPF displays the requested panel. If your choice contains an ellipsis (...), ISPF displays a pop-up window. When you exit this panel or pop-up, ISPF closes the pull-down and returns you to the panel from which you made the initial action bar selection.

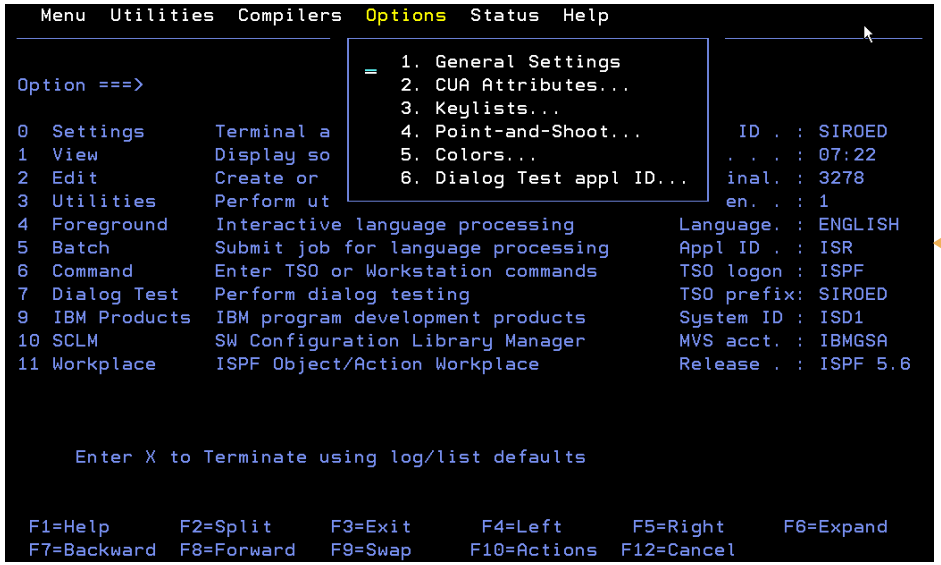
To select a choice from a pull-down menu, type its number in the entry field (underlined) and press Enter or select the choice. To cancel a pull-down menu without making a selection, press F12 (Cancel).

Note: If a choice displays in blue (the default) with an asterisk as the first digit of the selection number, the choice is unavailable and cannot be selected. This could be because recursive selection is not permitted or because the choice represents the current state.

Navigating in ISPF – using the action bar…

You can use the ACTIONS command (or function key) with or without a mnemonic to move the cursor to the action bar. When you enter the command and press Enter, the corresponding pull-down menu is displayed.





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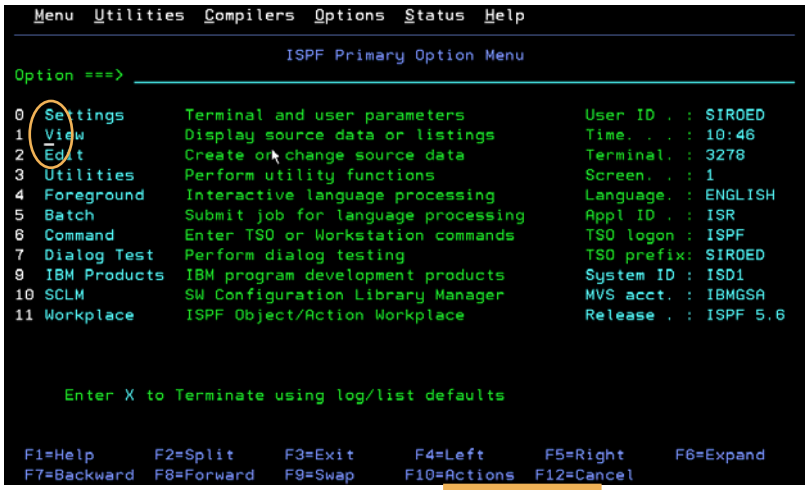
There are several ways to move the cursor to the action bar:

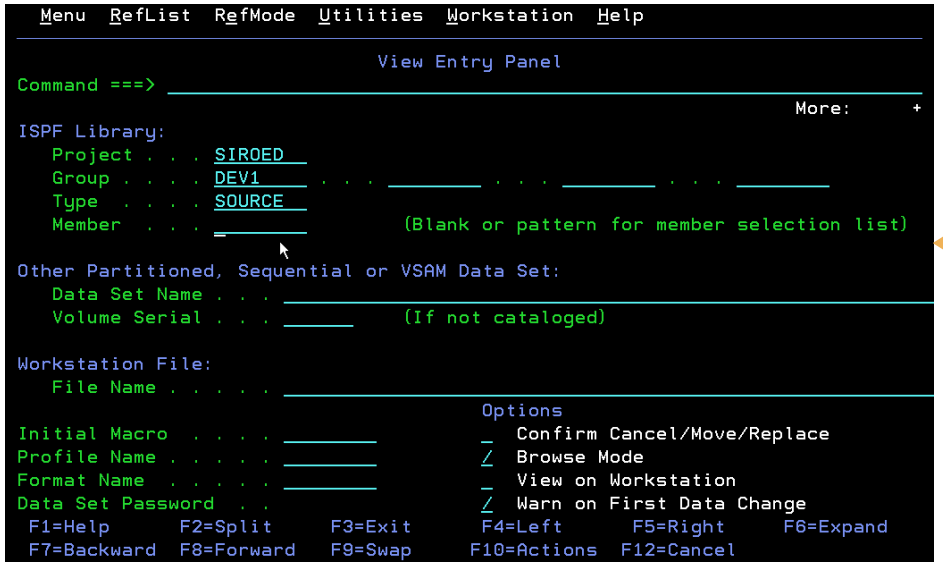
- Use the cursor movement keys to manually place the cursor on an action bar choice.
- Type ACTIONS on the command line and press Enter to move the cursor to the first action bar choice.
- Press F10 (Actions) or the Home key to move the cursor to the first action bar choice.
- If mnemonics are defined for action bar choices, you can enter the ACTIONS command and the mnemonic letter that corresponds to an underscored letter in the action bar choice text, or you can enter the mnemonic letter that corresponds to an underscored letter in the action bar choice text, and press the function key assigned to the ACTIONS command. This results in the display of the pull-down menu for that action bar choice

Navigating in ISPF – using point-and-shoot fields

Point-and-shoot text fields are cursor-sensitive. Position the cursor on the field and press Enter.

Here we're selecting the View option from the Primary Option Menu.





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Point-and-shoot text fields are cursor-sensitive; if you select a field, the action described in that field is performed. For example, if you select Option 1, View, ISPF displays the View Entry panel.

Note: If you have entered a command on the command line, this command is processed before any point-and-shoot command unless you are running in GUI mode.

Note: You can use the Tab key to position the cursor to point-and-shoot fields by selecting the "Tab to point-and-shoot fields" option on the ISPF Settings panel (Option 0).

Using commands and function keys

ISPF provides commands for commonly used functions. You can enter a command by:

- Typing the command in the command/option field and then pressing Enter
- Pressing a function (F) key that has been assigned a command
- Selecting a pull-down choice from an action bar
- Selecting a point-and-shoot field on a panel

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Using commands and function keys…

ISPF provides over 80 system commands. Some of the more commonly used commands include:

ACTIONS	END	PANELID	START
CANCEL	EXIT	PHSFOW	SWAP
CRETRIEV	KEYS	RETRIEVE	TSO
DTEST	NRETRIEV	SPLIT	TUTOR

Included in these system commands are the scroll commands:

BACKWARD*	BOTTOM**	DOWN	FORWARD**
LEFT	RIGHT	TOP*	UP

* Alias for the UP command
** Alias for the DOWN command

ISPF also supports user or site commands, application commands, and function commands.

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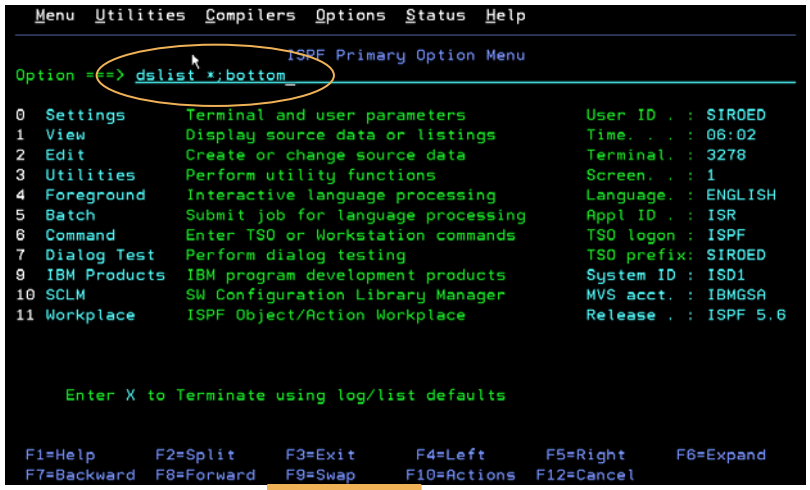
In addition to ISPF system commands, there are several other types of commands in ISPF:

User or Site commands	Defined by the site administrator (in the ISPF Configuration table) and available to a user, in addition to the system commands.
Application commands	Available to a user throughout the processing of an application.
Function commands	Meaningful only while using a particular function within an application.

System, user, site, and application commands are defined by using command tables. The DM component processes these commands. System, user, site, and application command processing is generally transparent to the dialog functions. For example, HELP is a system command.

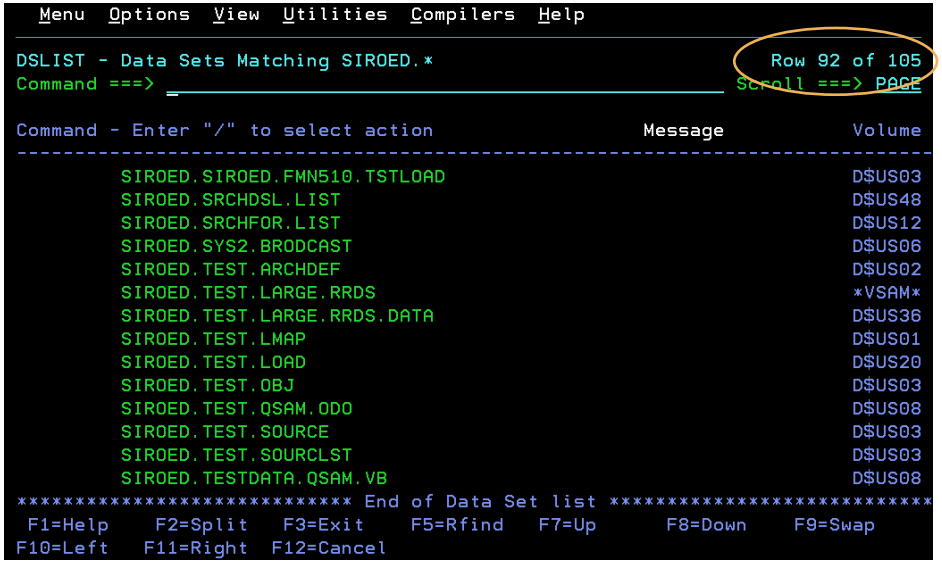
Function commands include all commands that are processed by a dialog function. For example, the NUMBER command within the ISPF Editor (option 2) is a function command.

Using commands and function keys…



You can enter multiple commands in a single interaction. ISPF processes the commands as if you had entered them one after the other.

Separate stacked commands with a delimiter character (default is a semicolon).



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You can stack commands to be run by entering a special delimiter between the commands. For example, entering: **===> dslist *;bottom** causes the DSLIST command to run first. When it completes, the data set list is scrolled to the bottom. The default delimiter is a semicolon. Use the Settings option (0) to change the delimiter.

Commands cannot be stacked following the:

- HELP command. HELP processing deletes any remaining commands in the stack.
- RETRIEVE command.

Using commands and function keys…

Function keys are used to simulate command entry:

- Use the function keys for command entry to save time and reduce typing errors.
- Default function key definitions are already assigned to many of the frequently used system commands.
- Function key assignments and labels for an application panel can be defined and stored within a keylist. Most ISPF panels have keylists.
- You can type information into the command/option field before pressing a function key. The key definition is concatenated ahead of whatever you typed into the command/option field to form the complete command.

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Under ISPF, function keys are not automatically assigned to special functions. You equate each function key to a character string. When you press a function key, it simulates command entry. The processing is the same as if you had typed the character string in the command field and pressed the Enter key.

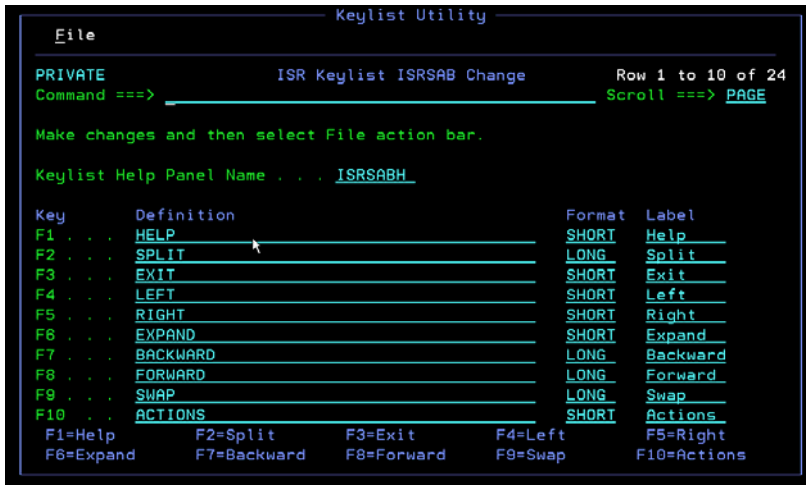
Note: On a 3270 display, the horizontal divider line that separates the logical screens is not considered part of either logical screen. If the cursor is placed on this horizontal divider line and a function key is pressed, the result is the same as if the ENTER key was pressed and the cursor is positioned on the active logical screen's command line.

A dialog function cannot distinguish the difference between a command entered by a function key and a command entered by typing in the command field. If the character string with which the function key is equated is longer than the screen's command field, the string is truncated without warning.

If you type information on the command line and then press a function key, the function key definition, followed by a blank, is concatenated ahead of the contents of the command field. For example, suppose F7 is equated to the character string **UP**. If you type **4** in the command field and then press F7, the results are exactly the same as if you had typed **UP 4** in the command field and pressed the Enter key.

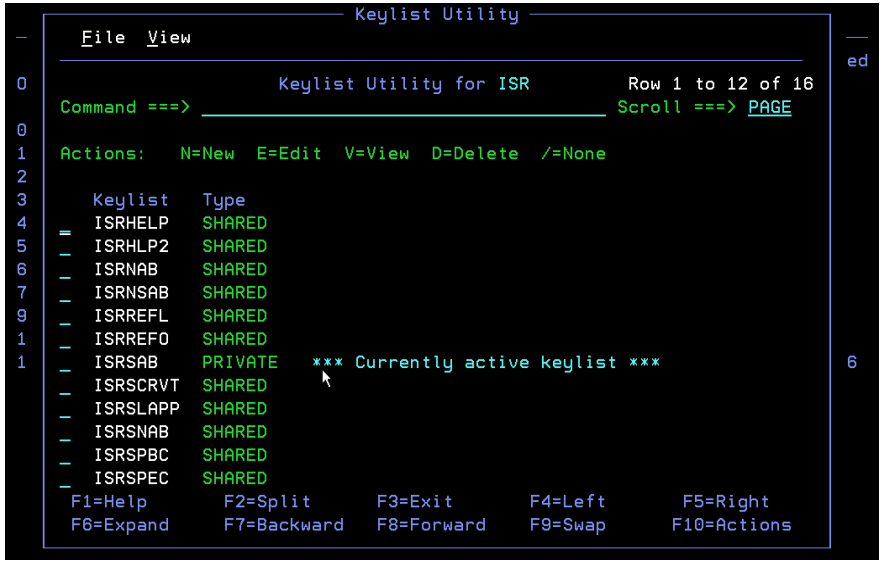
Function keys can be displayed at the bottom of a panel. Using the FKA or PFSHOW command, you can display either the long or short form of the keys, or remove the keys from the panel.

Using commands and function keys…



Function keys can be changed from the Settings menu or by entering the KEYS command from a command line.

Or you use the Keylist Utility. You can invoke the Keylist Utility from the Settings menu or by entering the KEYLIST command from a command line.



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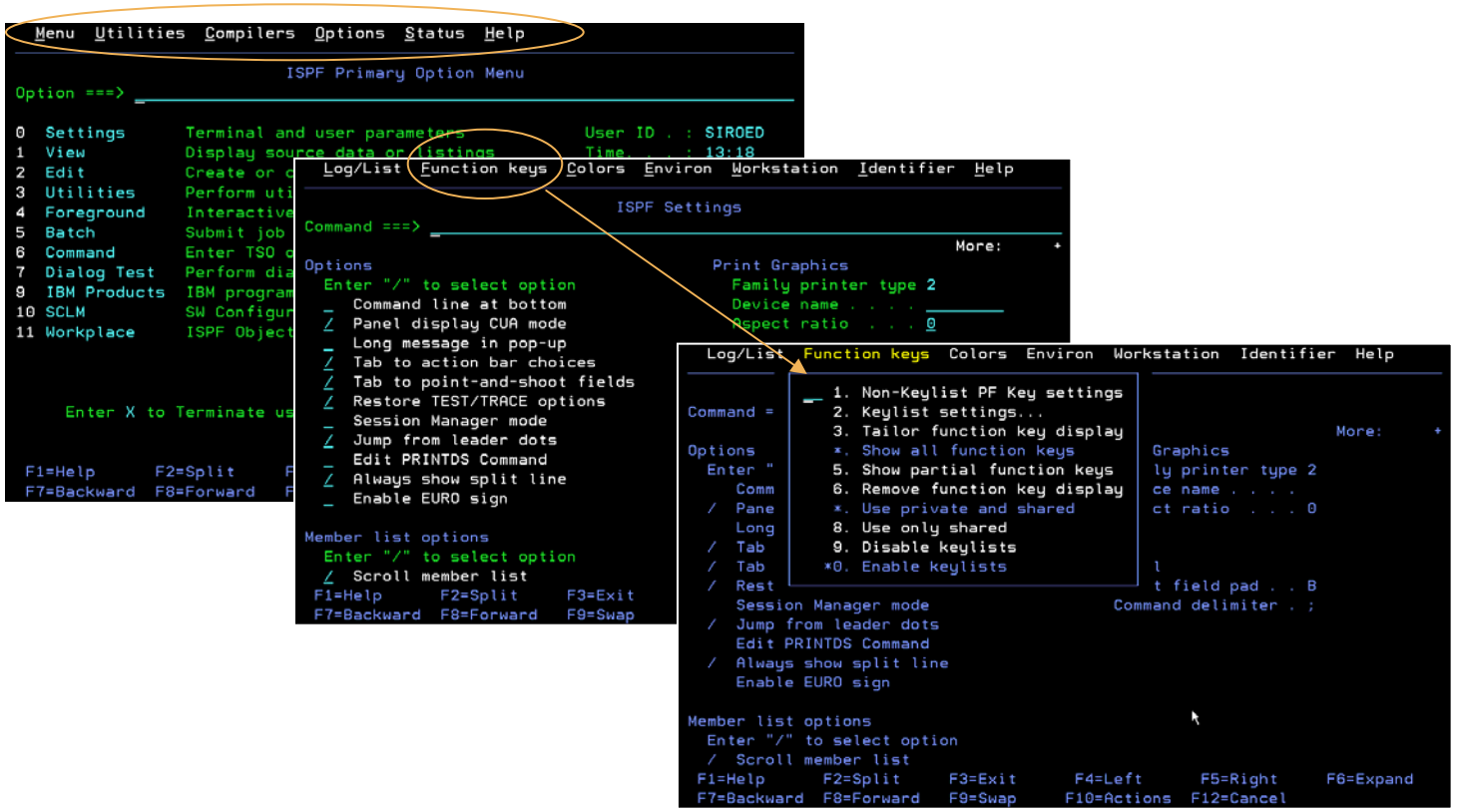
You can define function key values three ways:

- Use the KEYS command to display the Keylist Utility panel or, if you’re not using keylists, the PF Key Definitions and Labels panel, then change the function keys for the panel you are on.
- If you’re using keylists, use the KEYLIST command or select the "Keylist settings" choice from the Function keys pull-down on the ISPF Settings panel.
- If you ‘re using keylists but need to change the non-keylist function keys, use the ZKEYS command or select the "Non-Keylist PF Key settings" choice from the Function keys pull-down on the ISPF Settings panel.

Using commands and function keys…

Most ISPF panels have action bars. The action bar is the area at the top of an application panel that contains action bar choices for the panel.

When you select an action bar choice, a pull-down menu of pull-down choices is displayed.



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Action bars give you another way to move through ISPF. Most ISPF panels have action bars at the top; the choices appear on the screen in white by default.

The action bar is the area at the top of an application panel that contains action bar choices for the panel.

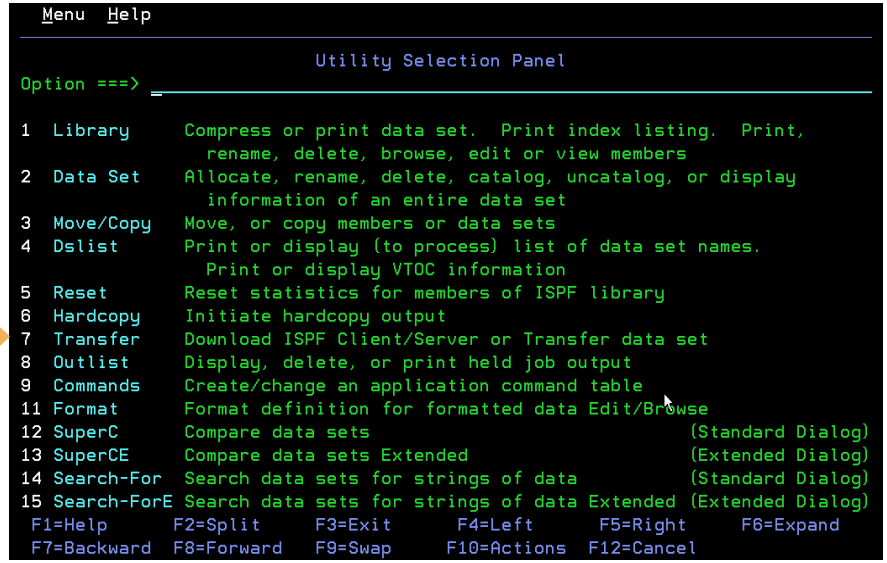
An action bar choice represents a group of related choices that appear in the pull-down associated with the action bar choice.

When you select an action bar choice, the associated pull-down appears directly below the action bar choice.

Pull-downs contain choices that, when selected, perform actions that apply to the contents of the panel.

Using commands and function keys…

Point-and-shoot fields are text fields on a panel that are cursor-sensitive. If you position the cursor on a point-and-shoot field and press Enter, the action described in that field is performed.



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Many ISPF panels also have point-and-shoot text fields, which appear in turquoise by default. Point-and-shoot text fields are cursor-sensitive; if you select a field, the action described in that field is performed. For example, if you select Option 3, Utilities, on the ISPF Primary Option Menu, the Utility Section panel is displayed.

If you have entered a command on the command line, this command is processed before any point-and-shoot command.

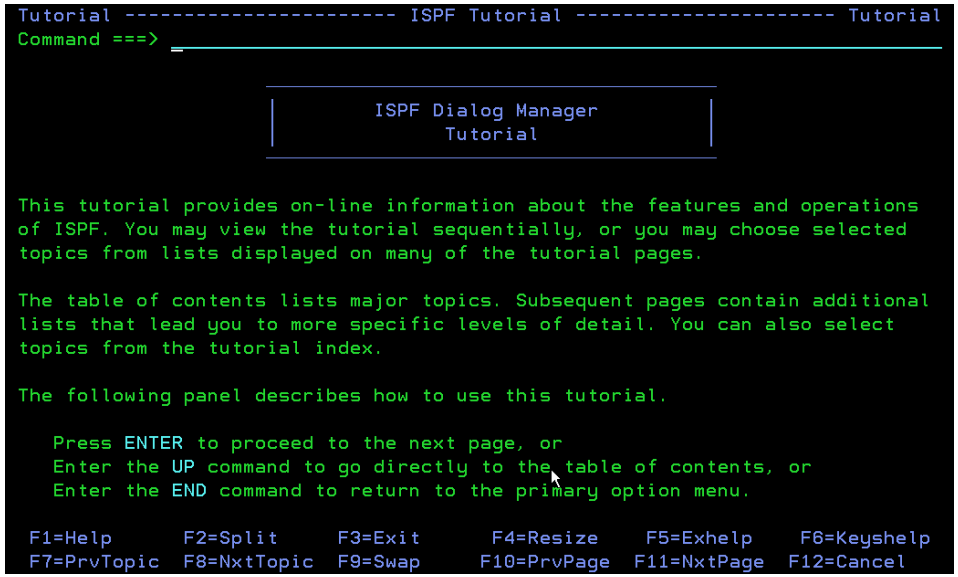
You can use the Tab key to position the cursor to point-and-shoot fields by selecting the "Tab to point-and-shoot fields" option on the ISPF Settings panel (Option 0).

Getting help

The HELP command shows you:

- General information about an ISPF system command or option
- General information about an ISPF panel
- More information about a message that has been displayed in the upper-right corner of the screen

If you enter the TUTOR command without a parameter, the general tutorial help panel is displayed.



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The HELP command (F1/13) shows you general information about an ISPF system command, ISPF option, or panel, or offers more information about a message that has been displayed in the upper-right corner of the screen.

For short messages, HELP displays a one-line explanation. To get further information, enter the HELP command a second time for the appropriate section of the tutorial. Long messages display (by default) in a pop-up window. Enter END (F3/15) or RETURN (F4/16) to return to the screen that you were viewing when you entered the HELP command.

The following types of help panels are available:

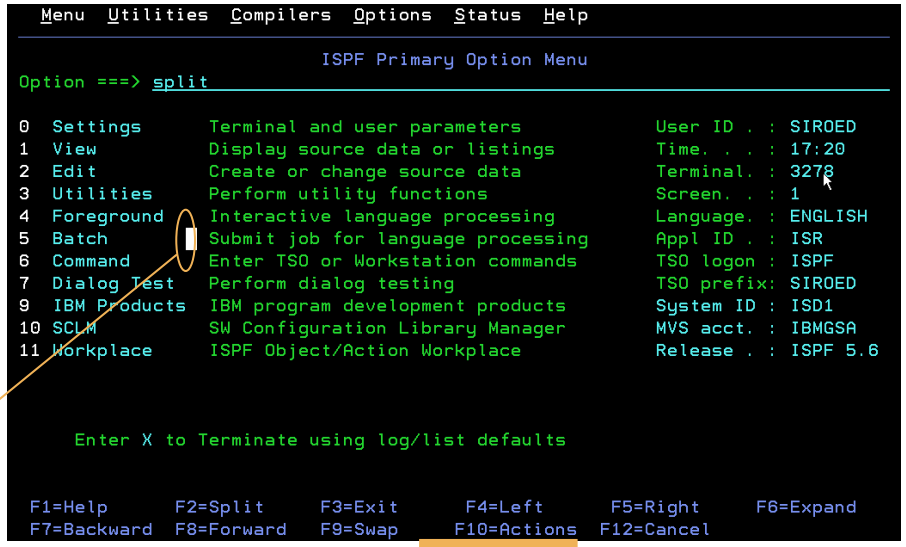
Field-level help	Provides help panels for individual fields on application panels. When the user enters the Help command, ISPF displays the help panel defined for the field on which the cursor is located.
Message help	Provides help for ISPF messages.
Panel help	Provides help for ISPF panels.
Tutorial	Describes the ISPF product. The tutorial is shipped with the ISPF product.

The TUTOR command calls the ISPTUTOR program to display specified tutorial panels. To display a particular tutorial panel, enter the TUTOR command along with the panel identifier of the desired tutorial panel as a parameter. If you issue the TUTOR command without a parameter, the general tutorial help panel (ISP00000) is displayed.

Split screen mode

You can use the SPLIT command to divide your 3270 display into two or more logical screens.

The position of the cursor defines the new logical screen.



Each logical screen is treated as a separate ISPF session.

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There might be times when you want to select another ISPF function without ending the current function. ISPF provides the ability to "split" the display screen into two or more logical screens that operate independently of one another.

You enter split-screen mode by using the SPLIT command. You also use this command to reposition the horizontal line that separates the two logical screens on a 3270 display. On a 3270 display the location of the cursor identifies the active logical screen. On a 3270 display, the horizontal divider line that separates the logical screens is not considered part of either logical screen. If the cursor is placed on this horizontal divider line and a function key is pressed, the result is the same as if the ENTER key was pressed and the cursor is positioned on the active logical screen's command line.

When the SPLIT command is entered without a parameter, if only one screen is currently being used, the physical display is divided into two logical screens with a divider at the cursor. If two or more screens exist, the divider line is moved, but no new screen is started.

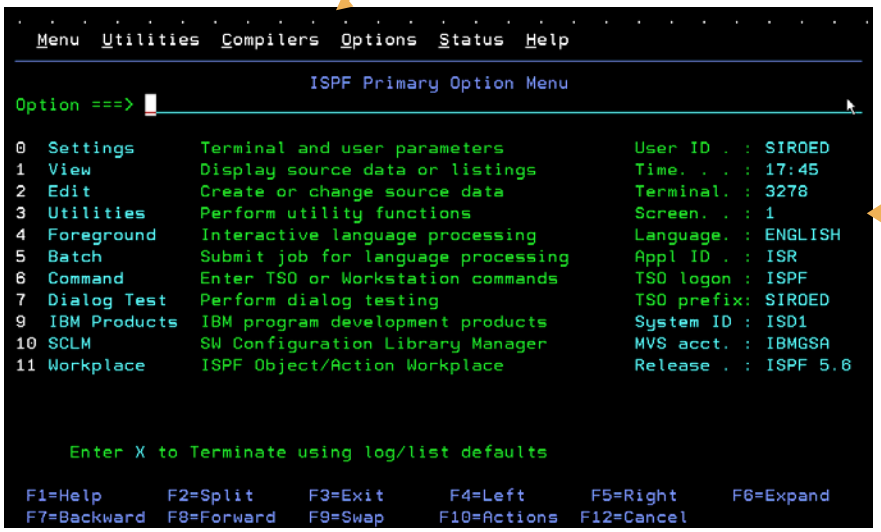
When the SPLIT NEW command is entered, a new logical screen is added each time the command is given, until the maximum number is reached. After the limit is reached, a message appears when the command is issued again. Each new logical screen is added below the cursor, where the split line appears. If two or more screens already exist, the new one replaces the screen in which the SPLIT command was *not* entered.

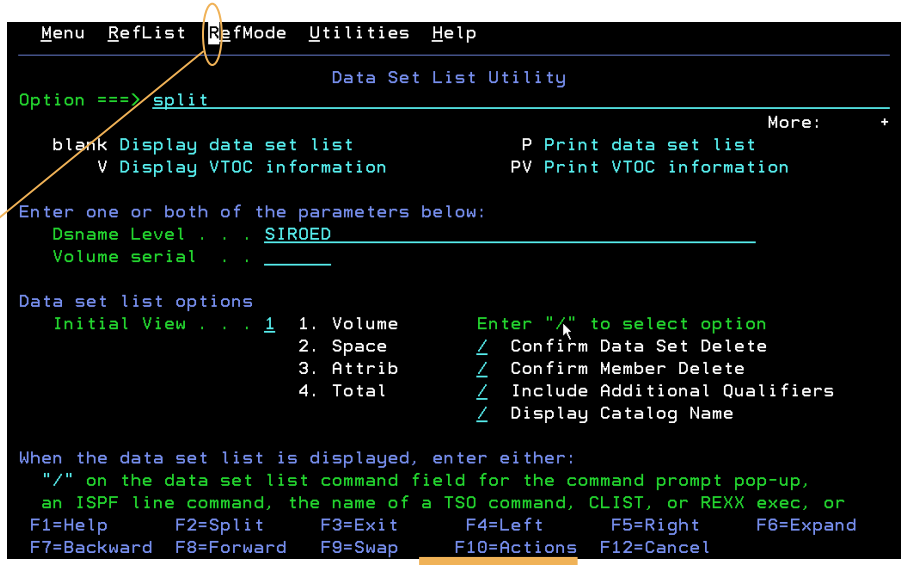
The maximum number of screens available to you depends on the value of the MAXIMUM_NUMBER_OF_SPLIT_SCREENS keyword in the ISPF Configuration table. ISPF ships with a default figure of 8. Support for up to 32 split screens is available for all terminal types except the 3290.

On a 3270, only two logical screens are ever displayed. Although a 3270 terminal can only display two screens at one time, there can be other screens that are not visible.

Split screen mode…

Position the cursor at the top or bottom of the screen to get a “full-screen” logical screen.





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In Settings (option 0), the **Always show split line** option specifies that the split line in split screen mode, as seen on a 3270 display, should always be shown. The default for this option is that the option is selected. By deselecting this option, the split line does not display when the screen is split at the top or the bottom of the screen.

Split screen mode…

Although you can have multiple logical screens, only one logical screen is ever active and, on a 3270, only two logical screens are displayed.

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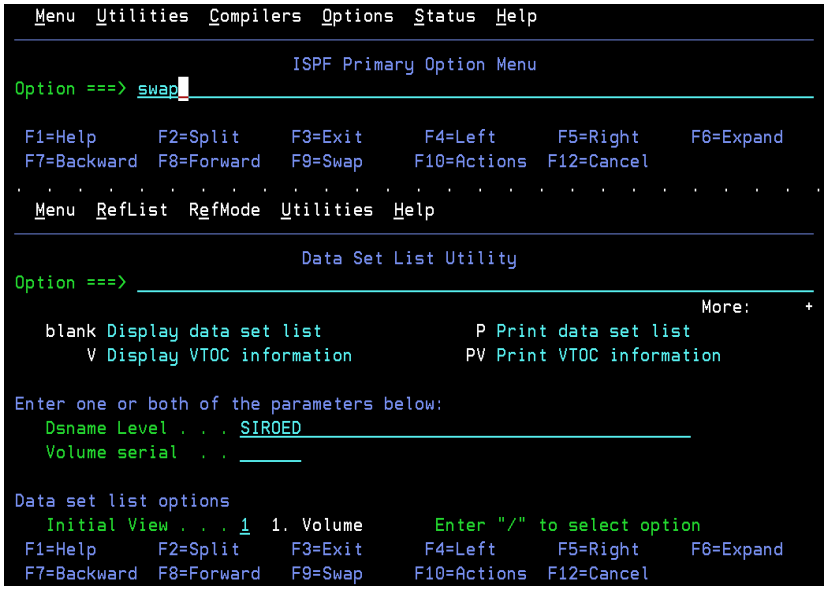
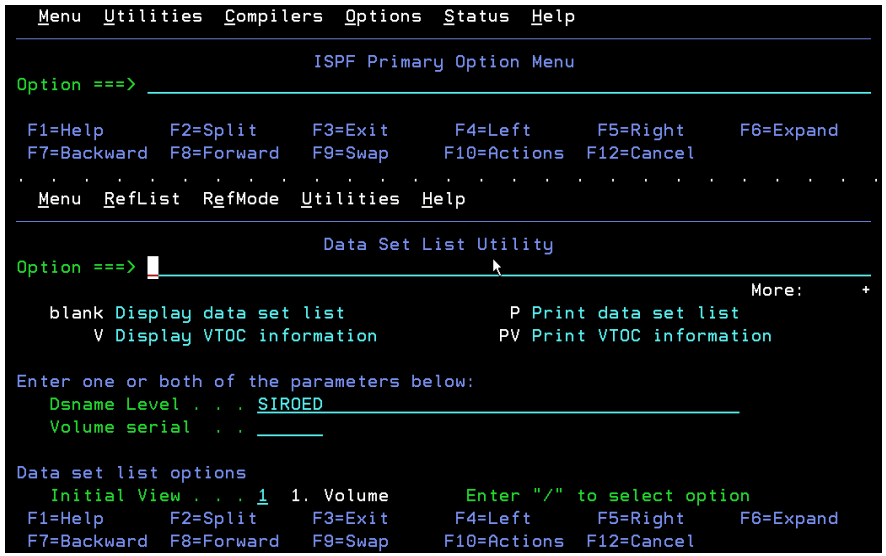
Split screen mode…

Only one logical screen is ever active. You can change the active logical screen by using the SWAP command.





SWAP without a parameter toggles between the current logical screen and the other screen displayed.

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Although you can alternately use any logical screen, only one of the logical screens is considered active at a time. The location of the cursor identifies the active screen. You make a screen active by using the SWAP command and its parameters to choose the desired screen.

When you enter the SWAP command without a parameter, if only one screen exists, this command has no effect. If more than one screen exists, this command moves the cursor between the two logical screens that are displayed.

The SWAP command allows a parameter to be specified so you can swap to a specific screen. The parameters on the SWAP command are LIST, PREV, NEXT, *screen_name*, and *n*.

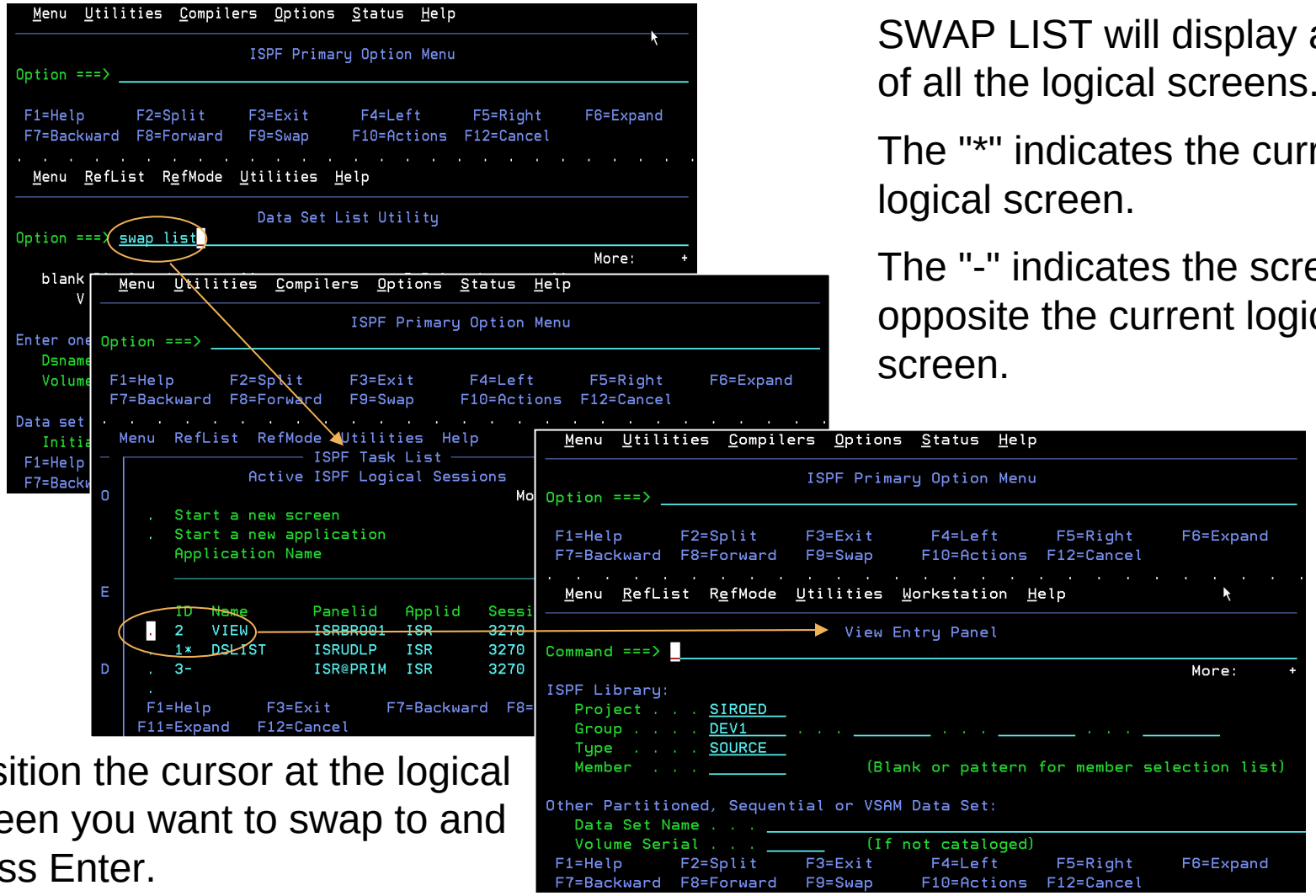
Entering SWAP PREV changes the display to the next lower screen number from the one where the command is entered. Repeatedly issuing the same command causes each lower-numbered screen to display until screen number 1 is reached, then the counter wraps back to screen number 32 (or your installation's maximum number).

Entering SWAP NEXT changes display to the next higher screen number from the one where the command is entered. Repeatedly issuing the same command causes each higher-numbered screen to display until screen number 32 (or your maximum) is reached, then the counter wraps back to screen number 1.

Entering SWAP *screen_name* changes display to the screen named *screen_name* if it is active. Screens can be named using the SCRNAME command.

Entering SWAP *n* changes the display to the screen numbered *n* if it is active.

Split screen mode…



SWAP LIST will display a list of all the logical screens.

The "*" indicates the current logical screen.

The "-" indicates the screen opposite the current logical screen.

Position the cursor at the logical screen you want to swap to and press Enter.

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SWAP LIST displays the ISPF Task list. You can choose which logical screen to swap to form this list.

Select an ISPF screen to switch to by positioning the cursor to an input field and pressing Enter.

The "*" indicates the current logical screen.
The "-" indicates the screen opposite the current logical screen.

A screen name may be assigned to a screen with the SCRNAME command.

Start a new logical screen by selecting 'Start a new screen' or start an application in a new logical screen by selecting 'Start a new application' and entering an application name in the Application Name input field. Any application name and parameters that are valid for the ISPF START command are valid in this field.
If additional space is needed, press the Expand PF key while the cursor is in this field and a popup window will be displayed containing a longer input field.

Ending ISPF

To end ISPF from the ISPF Primary Option Menu, you can use the:

- EXIT command (F3)
- END command
- RETURN command
- Exit option (X)

If you are not on the ISPF Primary Option Menu, you can still leave ISPF immediately by using the jump function =X.

In split-screen mode, taking these actions only ends ISPF on the current logical screen.

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To end ISPF from the ISPF Primary Option Menu, you can use the:

- EXIT command (F3)
- END command
- RETURN command
- Exit option (X)

If you are not on the ISPF Primary Option Menu, you can use the *jump function* to immediately leave ISPF from any panel by entering =X. There are two exceptions:

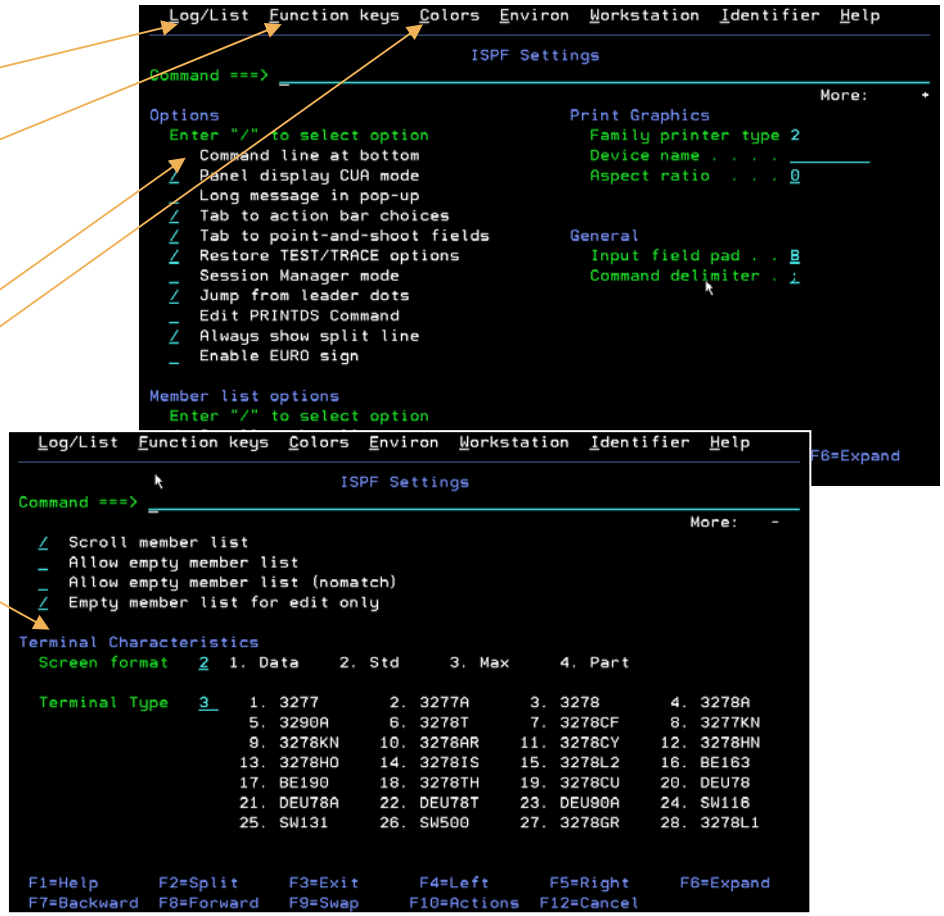
- If you are using any of the Dialog Test options (7.1-7.T) or the SCLM options (10.1-10.6), entering =X returns you to the ISPF Primary Option Menu.
- If you are at the Dialog Test or SCLM Primary Option Menu, enter either X or =X to return to the ISPF Primary Option Menu, then enter X or =X to end ISPF.

If the display screen is split, taking one of the actions listed above ends ISPF on the active logical screen only.

ISPF Primary Options – Settings (Option 0)

The Settings option allows you to configure your ISPF session by changing parameters such as:

- ISPF list/log data sets handling
- List data set characteristics
- Function key assignments
- Keylist settings
- Default colors
- Point-and-shoot color/highlighting
- Placement of command line
- Terminal characteristics



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The Settings option allows you to display and change a variety of ISPF parameters at any time during the ISPF session. Changes remain in effect until you change the parameter again, and ISPF saves them from session to session.

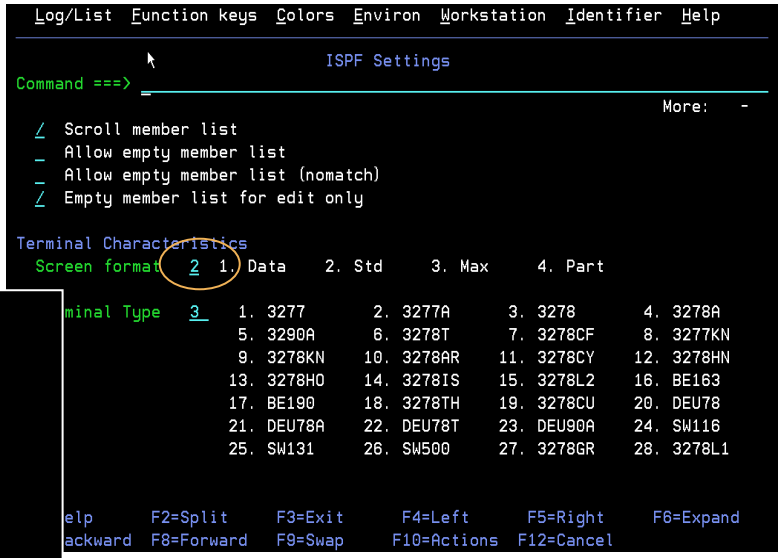
This chapter explains how to use the fields on the ISPF Settings panel and the action bar choices. Some of the things you can specify are:

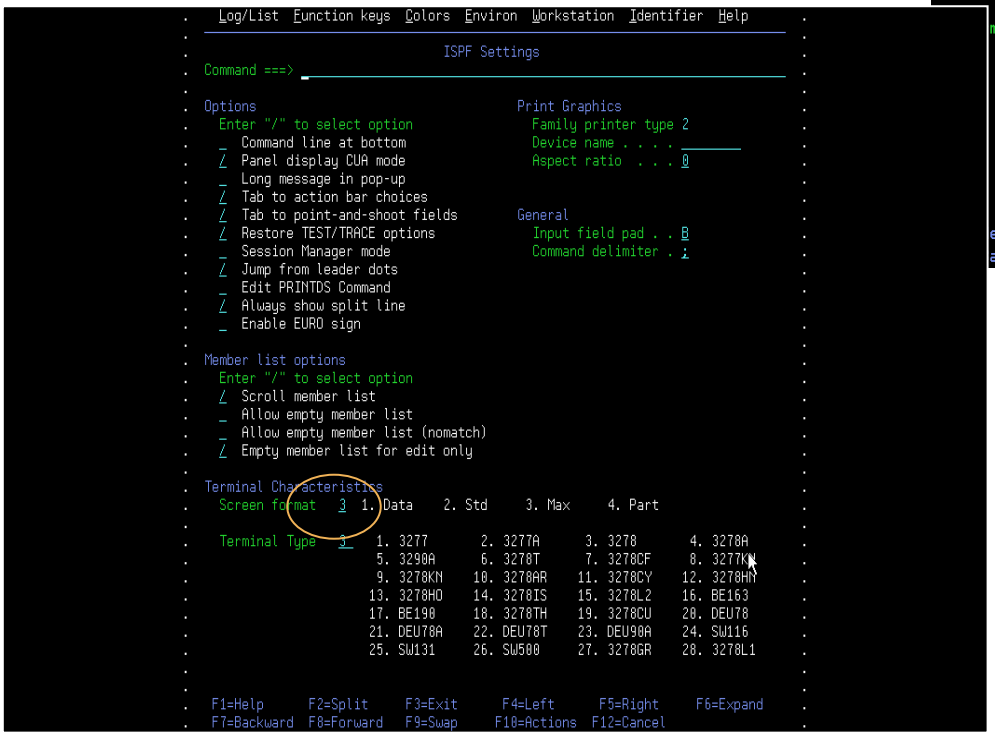
- Terminal characteristics
- Default options for processing the ISPF list and log data sets
- Function key assignments
- Placement of command lines
- List data set characteristics
- GDDM graphic print parameters
- Keylist modifications
- Dialog Test option
- Default colors
- Values of CUA panel elements
- Point-and-shoot color and highlight changes
- ENVIRON command options

This facility can be started from any command line with the SETTINGS command, from the **Settings** choice on the Menu pull-down on any action bar where it is available, or by selecting option 0 on the ISPF Primary Option Menu. Typically, the Settings facility should be included as an option on an application's primary option menu or as a choice on a pull-down on an application's primary option menu.

ISPF Primary Options – Settings (Option 0)…

ISPF supports screen sizes from 24x80 characters to 62x160 characters. On 327x terminals, you can change the screen format.





Changing the screen format from Std to Data allows more data to be displayed.

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The Terminal Characteristics portion of the ISPF Settings panel allows you to specify values for the screen format and terminal type.

Screen format

Specification of screen format applies only to 327**x** and 3290 terminals (or a terminal emulator set to a mode that emulates a 327**x** or 3290 terminal). ISPF ignores screen format for other types of terminal.

Data Format is based on data width.

Std Format is always 24 x 80 characters.

Max Format is determined by the maximum data width and height of the terminal or emulator.

Part Format uses hardware partitions (3279 only)

Terminal type

If you are using a terminal emulator, select the type of terminal that is being emulated (more than likely, a 3278 or 3278**x**). Specification of a terminal type allows ISPF to recognize valid (displayable) characters. You should keep in mind that the terminal type value that you specify to ISPF might not be the actual terminal type. For example, if your terminal is a 3279, you specify 3278 because a 3279 terminal has the same character set as a 3278. The keyboard character sets for the specified terminal and the actual terminal are always compatible.

ISPF Primary Options – Settings (Option 0)…

Use the Log/List action bar choice to specify how your log and list data sets are handled when you end ISPF.

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ISPF helps you get hardcopy listings of source modules, and maintains a log of significant user activities. These items are kept in data sets called the list data set and the log data set, respectively. When needed, the two data sets are allocated automatically. They are temporary data sets named:

prefix.userid.SPFn.LIST
prefix.userid.SPFLOGn.LIST

prefix The data set prefix in your TSO profile. Used only if it is different from your user ID.
userid Your user ID.
n A number from 0 to 9.

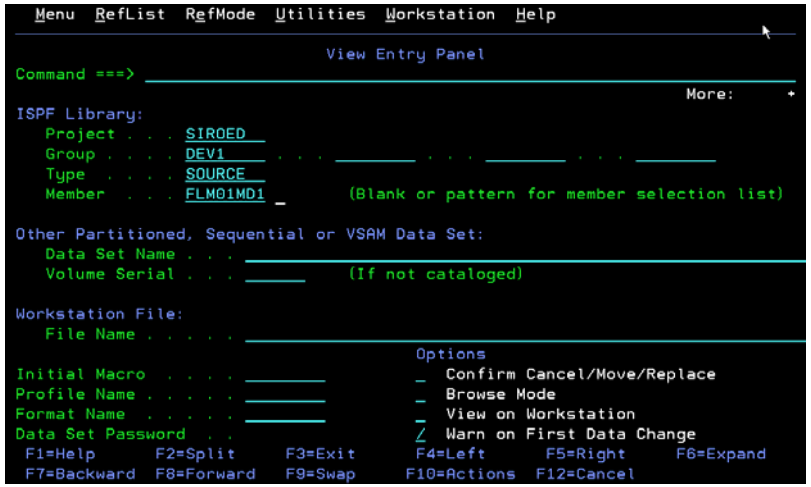
If you have specified in your TSO profile a data set prefix that differs from your user ID, the data set names begin with your data set prefix, followed by your user ID. Once generated, these data sets remain open throughout your ISPF session. However, even though they are open, you can still process them by using the ISPF LIST and LOG commands.

The Log/List pull-down on the ISPF Settings panel action bar allows you to specify the log and list data set defaults that are used when you terminate ISPF by issuing the RETURN or END command or by entering an **X** on the ISPF Primary Option Menu command line.

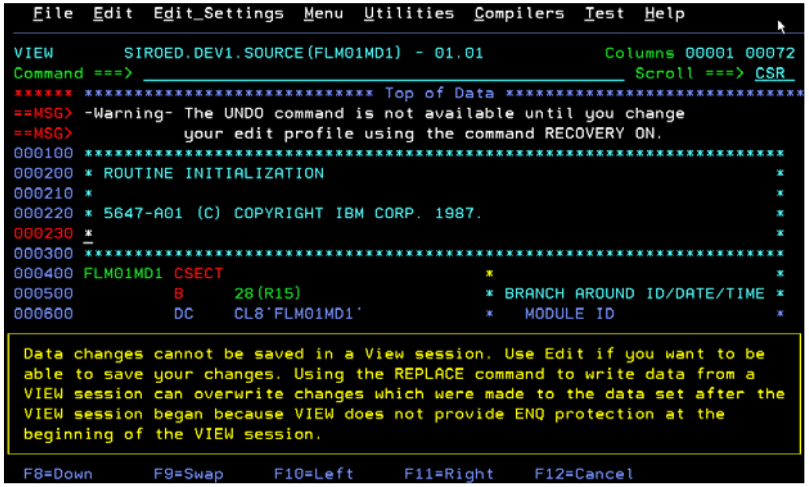
You can use the log settings to specify how the ISPF log data set is allocated, formatted, and processed, and you can use the list settings to specify how the ISPF list data set is allocated, formatted, and processed. The options available on these panels are also displayed on the ISPF termination panel (if you exit by using the END command), and on the LIST/LOG command panels.

ISPF Primary Options – View (Option 1)

The View option allows you to view data in partitioned data sets or sequential data sets.



When you view a data set, you can use edit commands, but changes to the data are not saved when you end.



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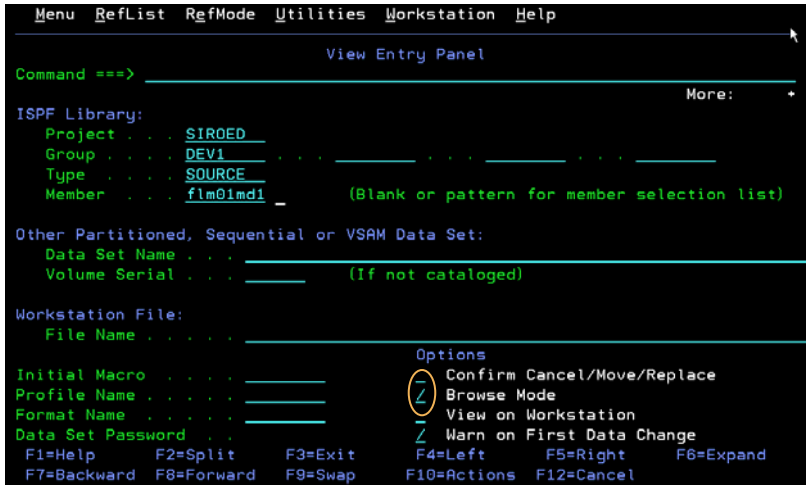
View allows you to display source data or output listings. With View, members of partitioned data sets, or DASD-resident sequential data sets can be displayed, and updated using Edit primary and line commands. Changes to data are not saved.

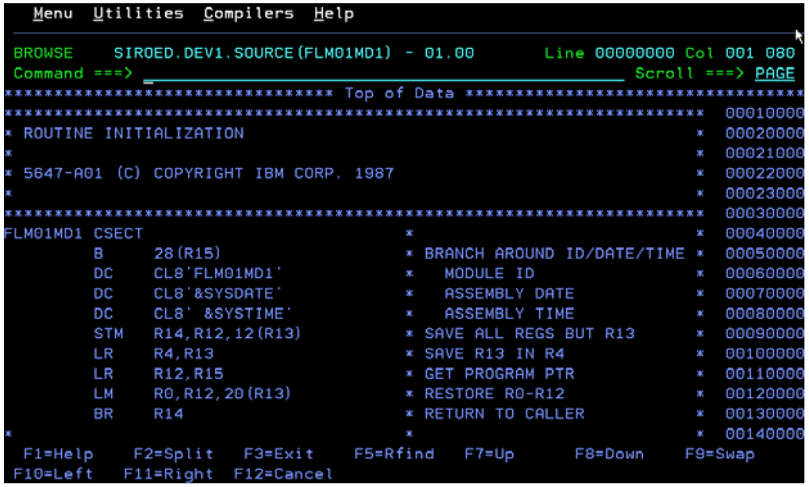
ISPF Primary Options – View (Option 1)…

The View option also allows you to browse data in PDS members or sequential data sets.



Browse mode is different than view mode:

- ↓You cannot use edit commands in browse mode.
- ↓You can browse larger data sets.
- ↓Performance is usually better.



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Browse also allows you to display data or output listings. With Browse, members of partitioned data sets, or DASD-resident sequential data sets can be displayed, and can be scrolled forward, backward, left, or right. Browse can be selected from the View Entry Panel.

In many ways browse can be considered a subset of edit. Browse is used instead of edit for three major reasons:

- There is no risk of accidentally changing data.
- Larger data can be handled since only the records that need to be read for the display are in main storage.
- Performance will normally be better because all of the data is not read into main storage.

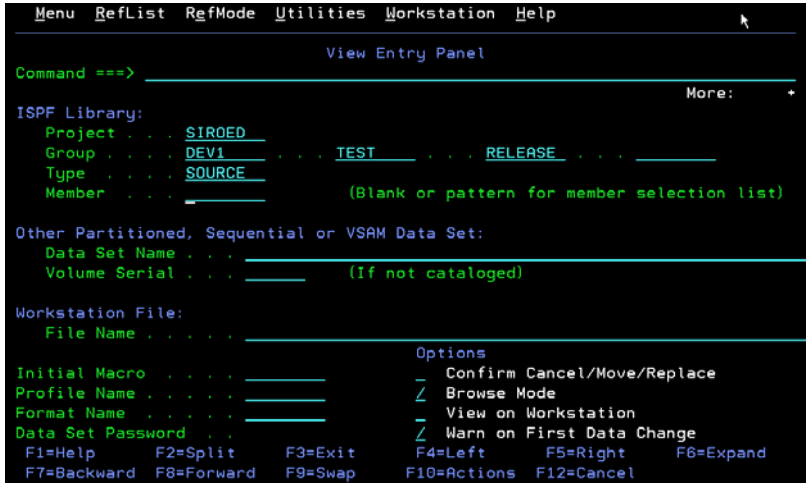
ISPF Primary Options – View (Option 1)…

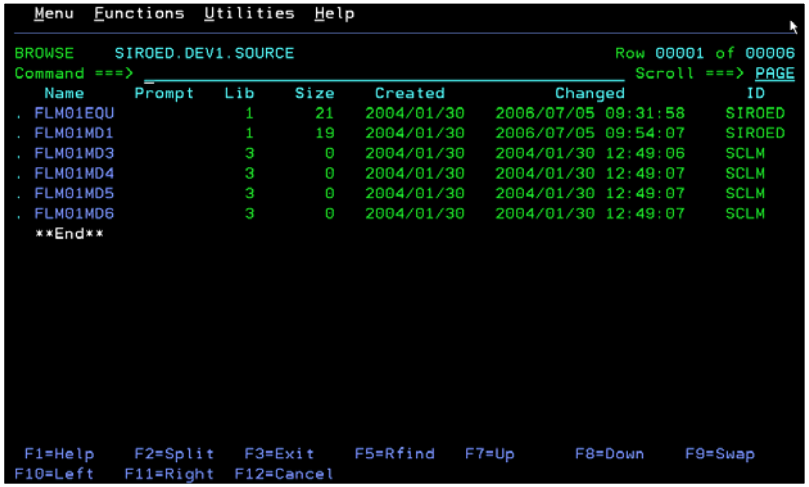
The data set being viewed or browsed can be an ISPF library.

An ISPF library is a cataloged PDS (or PDSE) with a three-level name consisting of a project, group, and type.

You can concatenate up to four PDSs with the same project and type identifiers.

If you don't specify a member name, a list of members is displayed.





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An ISPF library is a cataloged partitioned data set with a three-level data set name in this format: 'project.group.type'.

To specify an ISPF library, enter the library name in the following fields:

```
ISPF Library:
  Project  . .
  Group  . . .
  Type . . . .
  Member . . .        (Blank or pattern for member selection list)
```

Project The common identifier for all ISPF libraries belonging to the same programming project. This name must be your user ID unless you are using a specific project name that has been predefined in the MVS master catalog.

Group The identifier for a particular set of ISPF libraries, that is, the level of the libraries within the library hierarchy. For example, the group name of your private library could be PRIVATE or perhaps your first name, such as Joe.

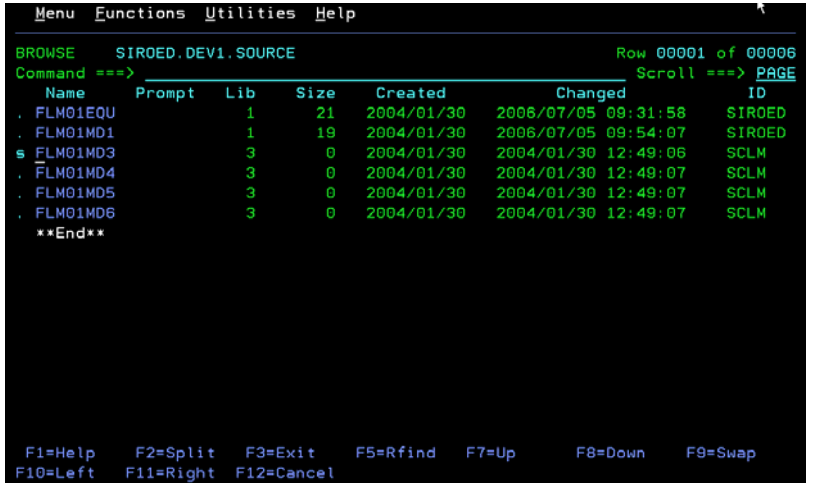
Type The identifier for the type of information in the ISPF library, such as PL/I, SCRIPT, or PANELS.

You can also enter a member name on many panels. If the member name is left blank or a pattern is entered, a member selection list is displayed.

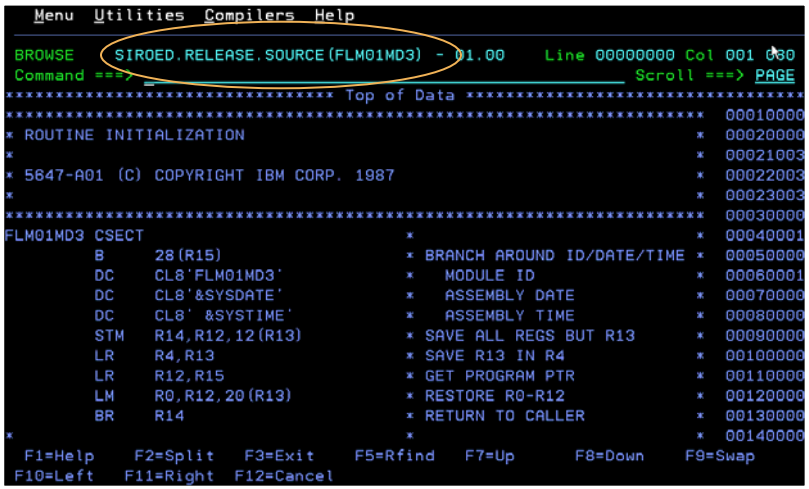
Whenever the first Group field is accompanied by three additional fields horizontally across the screen, you can enter a *library concatenation sequence*, which is a series of group names chained together. ISPF searches these groups in the sequence that you enter them.

ISPF Primary Options – View (Option 1)…

You can scroll through the member list to find the member you want to view or browse. Select the member using an S line command.



If you specified a concatenation of ISPF libraries, the member can be in any library of the concatenation.



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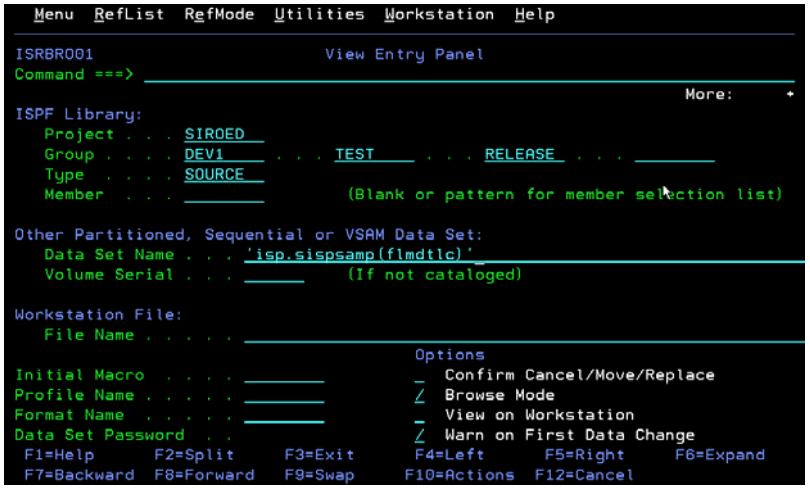
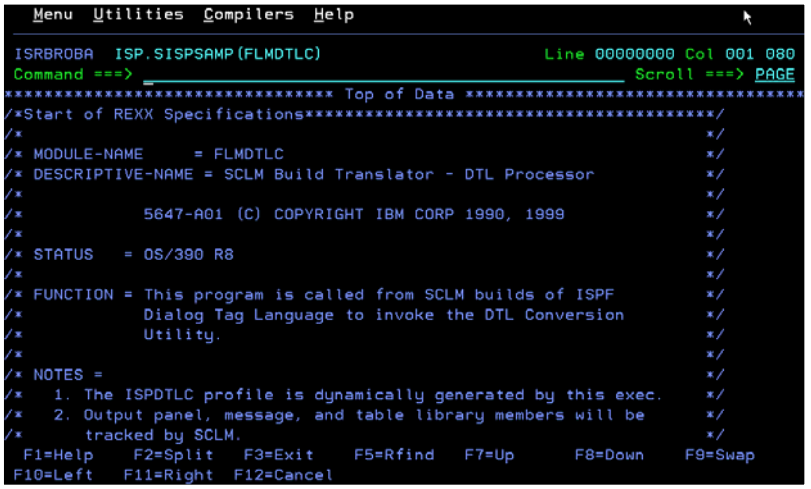
ISPF Primary Options – View (Option 1)…

The data set being viewed or browsed can also be any PDS, with or without a member name, or a sequential data set.

If you specify both an ISPF library name and an other data set name, the other data set name takes precedence.





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You can view or browse any partitioned or sequential data set by specifying the data set name in the **Other Partitioned or Sequential Data Set** field. **Data Set Name** can be any fully qualified data set name, such as **'USERID.SYS1.ASM'**. You can include either a TSO user prefix or user ID as the first-level qualifier of the data set name. If you omit the single quotes and if you have created a TSO user prefix, that prefix is automatically added to the beginning of the data set name. If you omit the single quotes and if you do not have a TSO user prefix, no prefix is added, and the name is used exactly as it appears.

If you include your user prefix or user ID, enclose the data set name with apostrophes. If you include the apostrophe at the beginning of the data set name but omit the one at the end, ISPF inserts it for you.

Note: ISPF does not support multivolume data sets or partitioned data sets with record format FBS or VBS.

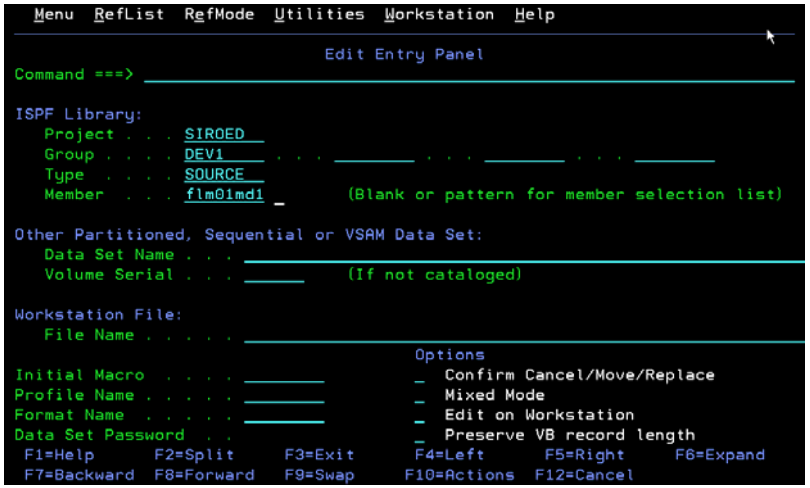
For partitioned data sets, a member name enclosed in parentheses can follow the data set name. For example: **‘ISP.SISPSAM(FLMDTLC)‘.** If you include the parenthesis at the beginning of the member name but omit the one at the end, ISPF inserts it for you.

When you omit the member name and parentheses or use a pattern ISPF displays a member list.

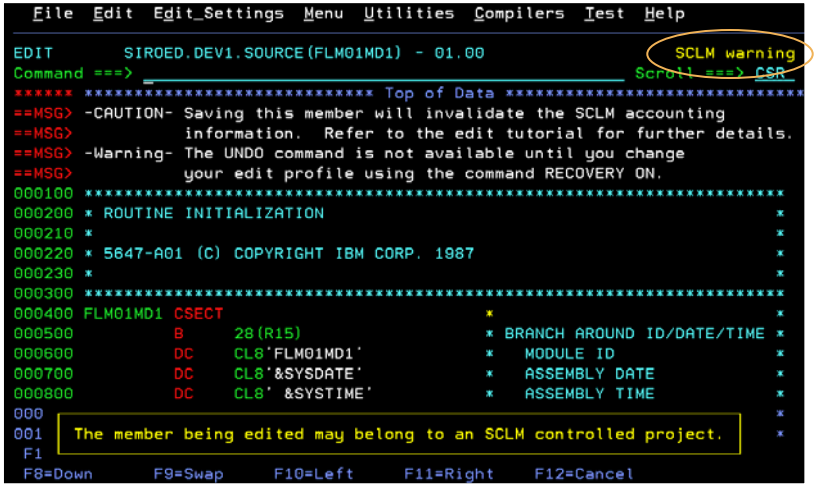
Note: For Edit, Browse, and View, a VSAM set can be specified if your site’s ISPF has been configured for with the name of a VSAM edit/browse product such as File Manager for z/OS.

ISPF Primary Options – Edit (Option 2)

The Edit option allows you to edit and change data in partitioned data set or sequential data sets.



Depending upon your site's configuration, when you edit an SCLM-managed PDS member, you get a warning or you may not be able to edit the member.



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The ISPF editor is a full screen editor. You can use the ISPF editor to create, display, and change data stored in ISPF libraries or other partitioned or sequential data sets with the following characteristics:

Record Format (RECFM):

- Fixed or variable (non-spanned)
- Blocked or unblocked
- With or without printer control characters

Logical Record Length (LRECL):

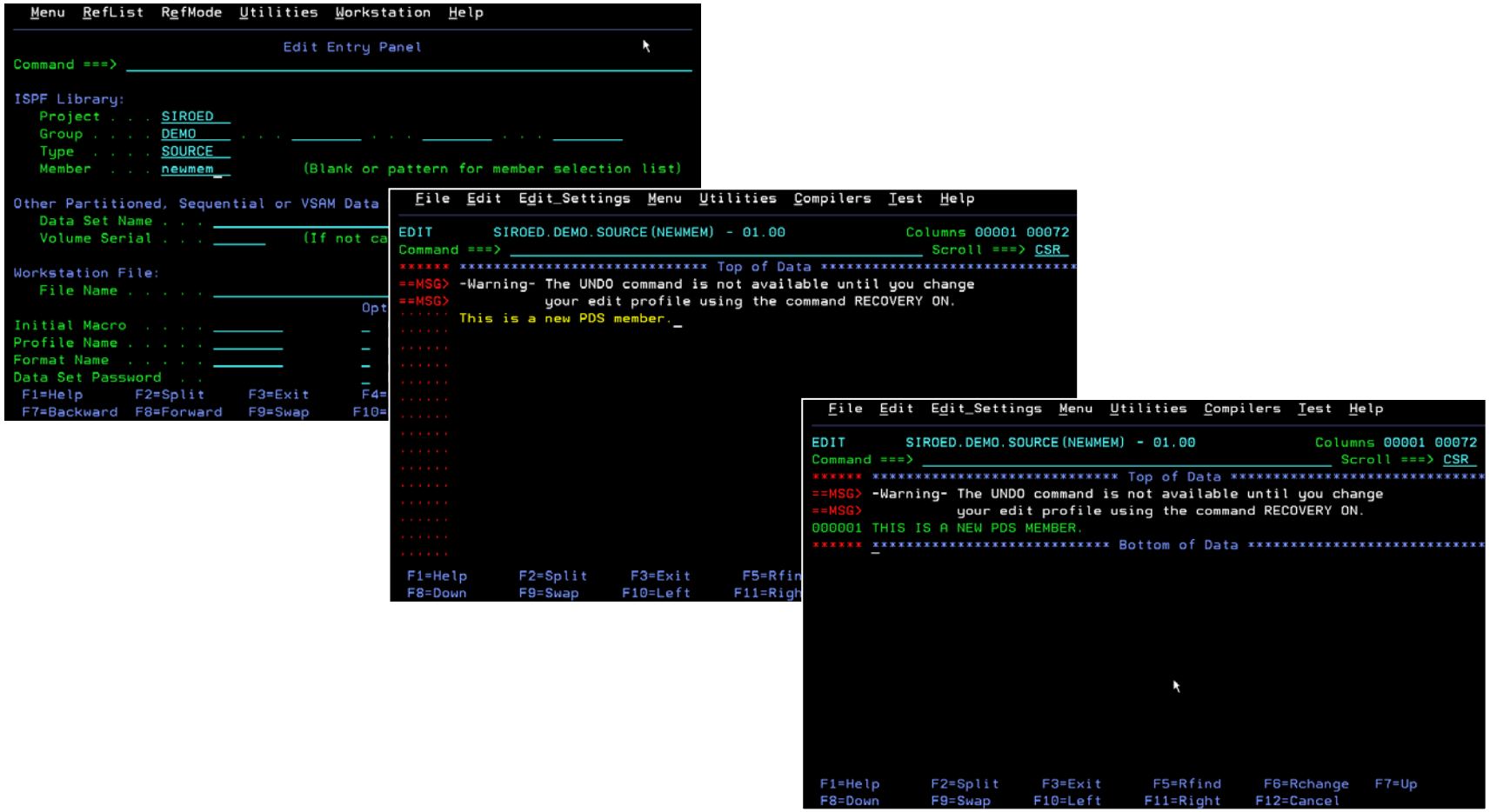
- From 1 to 32760, inclusive, for fixed-length records
- From 5 to 32756, inclusive, for variable-length records.

Note: For variable-length records, the amount of editable data in each record is 4 bytes less than the logical record length.

When attempting to edit a member in an SCLM controlled project, you should use ISPF option 10.2 (the SCLM EDIT interface). If you use the option 2 edit interface, ISPF will first determine if the project specified is SCLM controlled,and if it is, either a warning message will be displayed or the edit will not be allowed, depending on the setting of the ISPF configuration table.

ISPF Primary Options – Edit (Option 2)…

When you edit an empty data set or non-existent PDS member, the editor displays empty lines for you to input data.



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Before you can edit a new sequential data set, you must allocate space for it. When you specify an empty sequential data set or nonexistent member of a partitioned data set, the first edit display contains several empty lines between the **Top of Data** and **Bottom of Data** message lines. The editor replaces the quote marks on the left of the panel with sequence numbers when you type information on the lines.

ISPF Primary Options – Edit (Option 2)…

You can customize your edit environment. Customization settings are stored in edit profiles.

In the previous example, we saw text that was entered in lower case was converted to uppercase.

This is because caps mode is on. You can see whether caps mode is on or off, along with other edit mode information, by displaying the edit profile with the PROFILE command.

Special "=PROF>" lines will be displayed. These lines indicate the current setting of the various profile modes.

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ISPF defaults control much of the editing environment. However, you can use line and primary commands to change number and statistical fields on a data display panel and to determine how the data appears.

The current settings of edit modes, together with the current MASK, TABS, and BOUNDS definition lines, are maintained in an edit profile which can be displayed at any time via the PROFILE primary command. When the profile is changed, it is automatically updated in your user profile library.

Edit profiles are used to retain information that controls your edit session, including:

- The current setting of edit modes (NUMBER, CAPS, NULLS, etc.), and
- The current contents of the MASK, TABS, and BOUNDS definition lines.

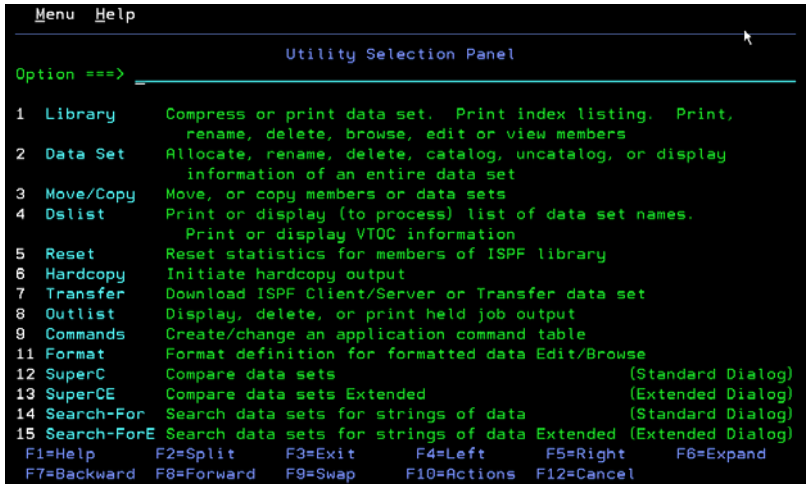
Each profile is normally identified with a data set type (the last qualifier in the data set name). This allows different mode settings and different MASK, TABS, and BOUNDS to be saved and used as the initial settings for different types of source data. For example, if you edit a data set with a name ending in COBOL, edit will use your COBOL profile. Similarly, your CNTL profile will be used for CNTL data sets. If you want to use a profile other than the one that edit would select for you, enter the profile name in the field that is provided on the edit entry panel.

Edit automatically creates a profile the first time that you attempt to reference it. The first time that you edit COBOL data, for example, a COBOL profile is created, and will be remembered. If you enter a new profile name on the edit entry panel, a new profile of that name will be created and remembered. If you already have the maximum number of edit profiles, your least-recently used profile will be deleted to make room for the new profile.

Edit automatically remembers the current setting for each mode in the profile. If you change from NUMBER OFF to NUMBER ON, you are telling edit to start generating sequence numbers. Edit then automatically remembers that NUMBER mode is on, so the next time that you edit with the same profile, NUMBER mode will be on. In other words, the profile always contains the last setting that you used for an edit mode or for special lines, such as MASK or TABS.

ISPF Primary Options – Utilities (Option 3)

The Utilities option provides a variety of functions for library, data set, and catalog maintenance.



You can access the utilities either from option 3 on the Primary Option Menu or from the Utilities action bar choice on the Primary Option Menu.

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The Utilities option provides a variety of functions for library, data set, and catalog maintenance. Among others, these include:

Library Utility (Option 3.1)

Maintains partitioned data sets.

Data Set Utility (Option 3.2)

Allocates, deletes, renames, catalogs, and uncatalogs data sets.

Move/Copy Utility (Option 3.3)

Copies or moves data from one data set to another.

Data Set List Utility (Option 3.4)

Display or prints lists of ISPF libraries, data sets, or volume table of contents (VTOC) information.

Download Data Set to Workstation Utility (Option 3.7)

Uploads or downloads data sets from the host environment to your workstation.

SuperC Utility (Option 3.12) and **SuperCE Utility** (Option 3.13)

Compares data sets.

Search-For Utility (Option 3.14) and **Search-ForE Utility** (Option 3.15)

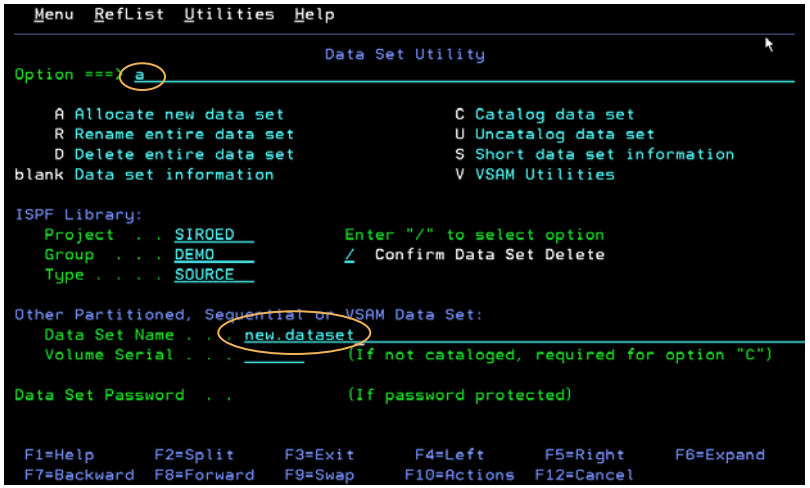
Searches data sets.

ISPF Table Utility (Option 3.16)

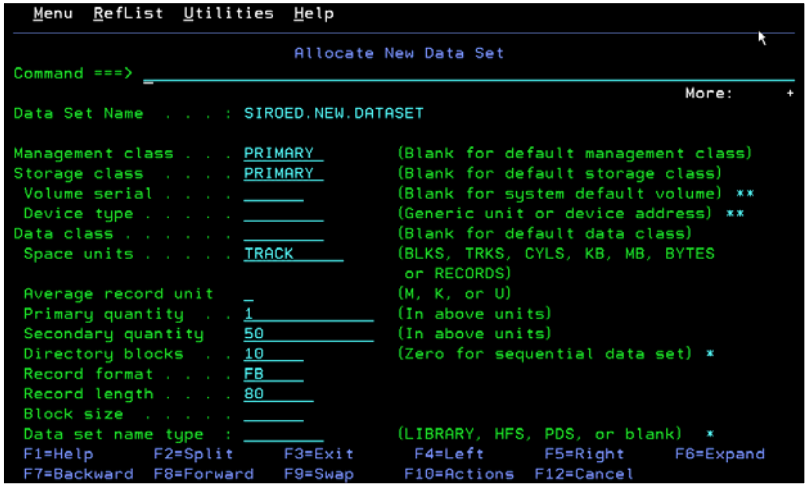
Processes ISPF tables.

ISPF Primary Options – Utilities (Option 3)…

The Data Set Utility allows you to allocate a new data set.



When you allocate a new data set you need to specify all the data set attributes. The Data Set Utility remembers many of these attributes from one invocation to the next.



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Other options

ISPF provides numerous other options. You can use these options to:

- Foreground (option 4)
  Run language compilers and certain other programs in foreground under ISPF.
- Batch (option 5)
  Run language compilers and certain other programs as batch jobs.
- Command (option 6)
  Run TSO commands, CLISTs and REXX execs.
- Dialog Test (option 7)
  Test your ISPF dialog entities (functions, panels, variables, messages, tables, skeletons) and complete ISPF applications.
- IBM Products (option 9)
  Invoke other IBM program development products.
- SCLM (option 10)
  Access the Software Configuration and Library Manager (SCLM) .
- Workplace (option 11)
  Access the ISPF Object/Action Workplace which combines many of the ISPF functions onto one object-action interface.

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To allocate a new sequential or partitioned data set on a direct access device, fill in the following fields of the data set utility panel:

- Enter A in the option field.
- Enter the new library or data set name in the appropriate fields.

You will then be shown the Allocate New Data Set panel, on which the input fields have been pre-entered. ISPF remembered these values from your most recent use of either:

- Allocate new data set, or
- Display data set information.

How to Learn More

- **Get your hands dirty!**
  - ↓ Use ISPF
    - The editor
    - The Data Set List Utility
    - The HELP facilities
      - HELP command (PF1)
      - Tutorial (TUTOR command)
- **Read the manuals**
  - ↓ SC34-4822-09: ISPF User's Guide, Volume 1
  - ↓ SC34-4823-09: ISPF User's Guide, Volume 2
  - ↓ SC34-4820-09: ISPF Edit and Edit Macros
- **z/OS Basic Skills Info Center**
  - ↓ http://publib.boulder.ibm.com/infocenter/zos/basics/index.jsp

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This presentation has only scratched the surface in terms of the features and capabilities of ISPF's editor and data set utilities. There is plenty more to learn!

The best way to learn more is to use ISPF. Play with the editor to find out more about its capabilities and features. Use the Data Set List Utility as the place where you manage your data sets. It provides interfaces to many other ISPF data set utilities so you will soon get familiar with these as well. There is lots of information available online through the ISPF HELP facilities. The ISPF tutorial is a hierarchy of panels which allows you to easily navigate through a vast amount of helpful information relating to ISPF. The tutorial can be invoked using the TUTOR command. From any panel within ISPF you can enter the HELP command to learn more about that particular panel and its function.

The ISPF manuals are an obvious source of information. The ISPF User's Guide Volume I provides introductory information about using ISPF. The ISPF User's Guide Volume II provides specific information on each of the ISPF options. The ISPF Edit and Edit Macros manual describes how to use the ISPF editor.