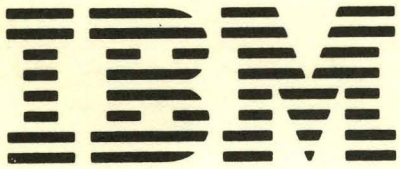

SC21-7716-3

File No. S34-32

IBM System/34
Screen Design Aid
Programmer's Guide and Reference Manual

Program Number 5726-UT1

SC21-7716-3

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IBM System/34
Screen Design Aid
Programmer's Guide and Reference Manual

Program Number 5726-UT1

Fourth Edition (September 1982)

This is a major revision of, and obsoletes SC21-7716-2 and technical newsletters SN21-8112, SN21-8207, and SN21-8256. Changes or additions to the text and illustrations are indicated by a vertical line to the left of the change or addition. Because the changes and additions are extensive, this publication should be reviewed in its entirety.

This edition applies to release 8, modification 0 of the IBM System/34 Utilities Program Product (Program 5726-UT1) and to all subsequent releases and modification levels until otherwise indicated in new editions or technical newsletters. Changes are periodically made to the information herein; these changes will be reported in technical newsletters or in new editions of this publication.

This publication contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental. It is possible that this material might contain reference to, or information about IBM products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that IBM intends to announce such IBM products, programming, or services in your country. For example, ideographic support is available only in Far East countries.

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Preface

This manual is for programmers who want to use the screen design aid utility program (SDA), a part of the IBM System/34 Utilities Program Product, to create and maintain display screen formats and menus.

This manual describes how to use SDA with the ideographic and nonideographic versions of the system; it does not describe the procedures, control commands, and/or utility programs you can use instead of SDA. For information on those topics, refer to the *System Support Reference Manual*.

This program provides ideographic support when used with the ideographic version of the SSP and the ideographic hardware devices that version supports.

How This Manual Is Organized

The introduction lists the purpose of SDA and describes when and how it can be used. It also describes the SDA sign-on procedure, program options available, help text provided, command function key usage, and the SDA termination procedure.

Chapters 1-8 describe the eight options on the SDA menu.

Appendix A defines SDA recovery following an abnormal termination.

Appendix B shows how you might use SDA to create a WSU or RPG program.

Appendix C shows the HELP SDA display.

Prerequisite Publications

- *IBM System/34 System Support Reference Manual*, SC21-5155
- *IBM System/34 Work Station Utility Reference Manual*, SC21-7663
- *IBM System/34 Source Entry Utility Reference Manual*, SC21-7657
- *IBM System/34 RPG II Reference Manual*, SC21-7667

Related Publications

- *IBM System/34 Displayed Messages Guide*, SC21-5159
- *IBM System/34 Operator's Guide*, SC21-5158
- *IBM System/34 Installation and Modification Reference Manual: Program Products and Physical Setup*, SC21-7689
- *IBM System/34 Master Index*, SC21-7739
- *IBM System/34 Bibliography*, GH30-0231
- *IBM System/34 Keyboard Template*, GX21-7660
- ***IBM 5292 Color Display Station Programmer's Guide to Using Color,*** **GA21-9413.**
- ***IBM 5292 Color Display Station Operator's Guide,*** **GA21-9416.**
- ***IBM 5291 Display Station Operator's Guide,*** **GA21-9409.**

IBM publications are available that describe the IBM-supplied ideographic characters and list their corresponding IBM codes. Contact your country representative for further information.

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Introduction

During the development and testing of the application programs that will run on your System/34, it will be necessary to create and then modify many display formats. The screen design aid utility program (SDA) has been developed to help you do this. Instead of laying out your displays on grids and then coding S and D specifications for $SFGR or Work Station Utility (WSU), you can build your displays directly on the display screen. When the screen displays are as you want them, SDA will create the $SFGR or WSU source member for you. SDA also gives you the ability to add new formats to a member, modify existing formats, and delete formats you no longer need.

SDA also gives you the option of creating or modifying menus on the display screen. To create a new menu, a skeleton menu is displayed, and you fill in the blanks. When you add new operator procedures to an application, SDA lets you add them to the existing application menu.

SDA can also be used to generate a WSU program. Use SDA to build a format source member that contains your displays. Then use SDA to generate a basic WSU program that corresponds to the source member. You can then use SEU or SDA option 6 to add any calculations you require. Because SDA does not create the disk file descriptions (F- and I-specifications), you must create the source descriptions of the disk files being used before you compile the WSU program.

Another SDA option simplifies the creation of the RPG source specifications needed for a WORKSTN file. Use SDA to build a source member containing your displays. Then use SDA to build a skeleton RPG II program that corresponds to that source member. You can then use SEU to complete your program, or you can use the include function of SEU to place the generated RPG II source statements in your existing source program.

SDA supports both the 1920- and the 960-character display. In many cases, figures and examples are shown using both displays, but when there are minor differences between the two displays, figures and examples are shown using the 1920-character display only.

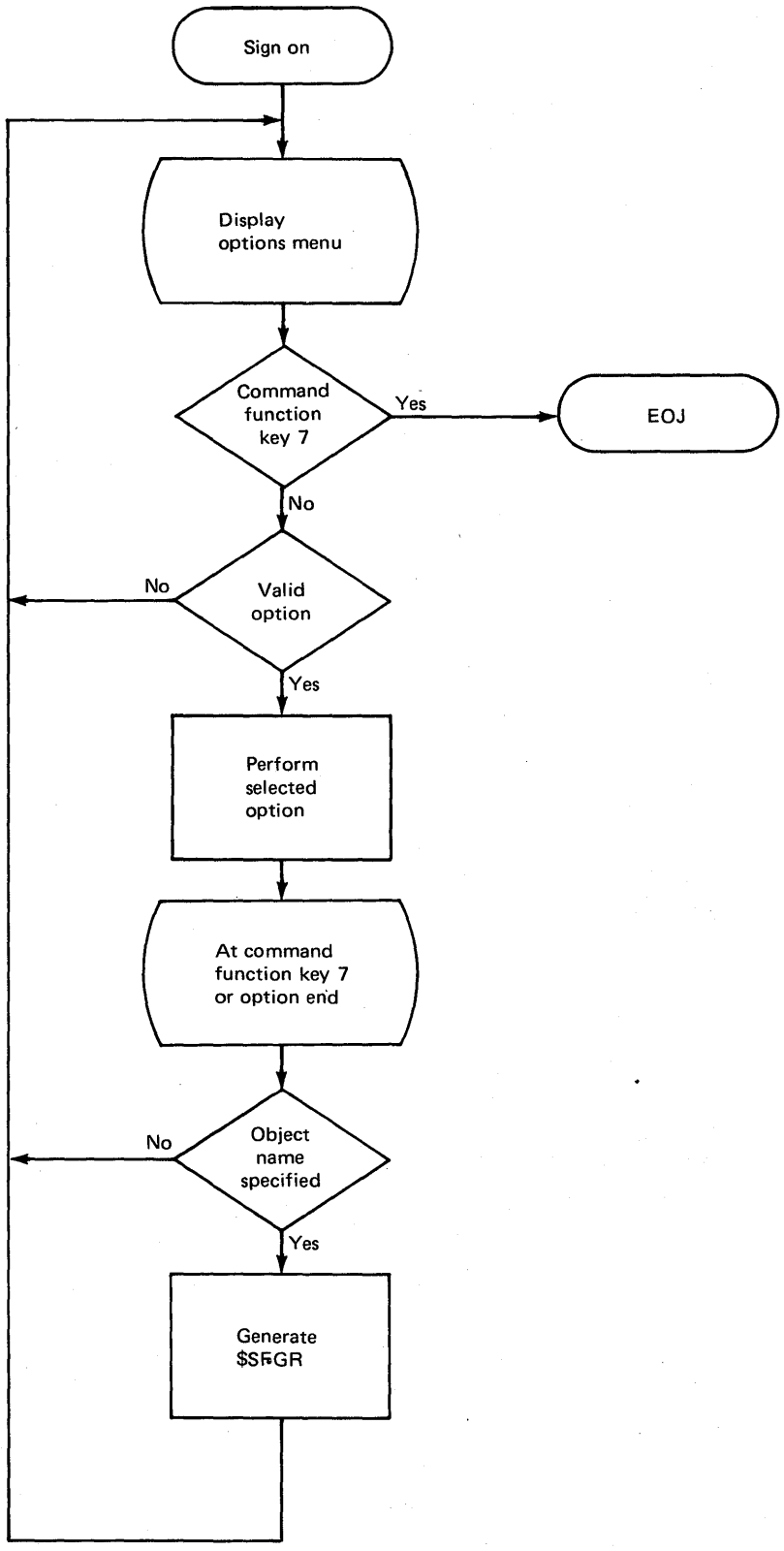
SDA enables customers to define display screen formats using ideographic characters. All functions of SDA will support Ideographic Characters.

Generally, a good practice to follow when you are using SDA is to record the format member names, format names, and menu names before you begin to create, add to, or update those format members or menus. The LISTLIBR command is useful for determining the names of existing format members or menus; refer to the *System Support Reference Manual* for more information.

Notes:

1. This manual describes how to use the SDA program; it does not describe the procedures, control commands, and/or utility programs you can use instead of the SDA program. For information on those topics, refer to the *System Support Reference Manual*.
2. The SDA procedure cannot be nested within a procedure.
3. The SDA procedure reserves bytes 1 through 104 of the local data area for its use. Therefore, any user data in these bytes will be destroyed.
4. If the SDA procedure resides in a user library other than the system library (#LIBRARY), you will only be able to create, add, or update format members that are in the specified user library. If the SDA procedure resides in the system library (#LIBRARY), you will be able to create, add, or update formats that are in any user library on the system.

This diagram shows the general logic flow of the SDA program.



SDA SIGN-ON

Enter one or more of the following parameters on the Command display:

```
          (1)      (2)       (3)          (4)          (5)       (6)
SDA  [source],[inlib],[sfgrload],[sfgrprint],[outlib],[sfgrlib]
```

The parameters you enter depend on the SDA program function requested. Only parameter 3 (sfgrload) is required, if needed by the function, because all other parameters have defaults. Enter commas as needed to maintain proper placement of parameters.

Note: The SDA sign-on procedure is the same in ideographic mode or nonideographic mode. The screen prompts are ideographic if the work station is in ideographic mode. The work station operator must answer with alphanumeric responses. If you want to create ideographic screen formats, you must be in the ideographic mode. Ideographic mode is entered by specifying yes to the ideographic prompt at sign-on. If you want to update ideographic screen formats, then you must be in the ideographic mode.

Function	**Parameters Used**
Create $SFGR source member	All
Add to, update, or delete an existing $SFGR source member	All
Display formats in an existing $SFGR object member	(2) inlib
Create WSU source member	(1) source (2) inlib (5) outlib
Add to, update, or delete an existing WSU source member	(1) source (2) inlib (5) outlib
Display formats in an existing WSU object member	(2) inlib
Update existing $SFGR source statement via SEU	All
Update existing WSU source statements via SEU	(1) source (2) inlib (5) outlib
Build a menu	(1) source (2) inlib (5) outlib
Build a WSU source program	(1) source (2) inlib (5) outlib
Build RPG II specifications for a WORKSTN file	(1) source (2) inlib (5) outlib

Parameter defaults are listed in the following parameter descriptions:

Parameter	Description
(1) source	The name of the source member to be processed. If you are processing formats, the default is SCRNSPEC. If you are building a menu (SDA menu option 7), the maximum length of the name is 6 characters and the default is SCRNSP.
(2) inlib	The name of the library in which SDA will find the member to be processed or displayed. The default is the system library (#LIBRARY). If you enter a name in this parameter, it will be the default for parameter 5 (outlib) and parameter 6 (sfgrlib).
(3) sfgrload	The name you want assigned to the load member created by $SFGR. If you do not enter a name, $SFGR will not be run when you finish running SDA, and the load member formats will not be generated.
(4) sfgrprint	Controls printing by $SFGR on the system list device. (SDA printing is controlled by command function key 6.) Enter YES, NO, or PARTIAL. The default is YES. YES causes the printing of S and D specifications, buffer descriptions, all messages, and lists the indicators used. NO causes the printing of only termination messages, together with the statement causing the error. PARTIAL causes the printing of input and output library names, screen format member names, and all messages together with their related statements.
(5) outlib	The name of the library in which SDA should write the created or updated source member or the menu command text and display text source members. The default is the system library (#LIBRARY) or the library name you entered in parameter 2 (inlib).
(6) sfgrlib	The name of the library in which $SFGR should write the object format member. The default is the system library (#LIBRARY) or the library name you entered in parameter 2 (inlib).

The display will change to the SDA menu when you enter the SDA command.

Notes:

1. Entering SDAH presents an explanation of the utility.
2. If you did not enter a source member name, or if you enter HELP SDA, SDA displays the Screen Design Aid screen, which shows the required parameters.

```
                          SCREEN DESIGN AID                  OPTIONAL-(O)

        SDA is a utility program that aids the user interactively
        to create and maintain display formats, menus, and WSU or
        RPG II program specifications.

 Source Member Name ..................................... SCRNSPEC

 Input Library Name ..................................... #LIBRARY

 $SFGR Load Member Name ..................................          (O)

 Print $SFGR Specifications (YES/NO/PARTIAL)..... YES

 Output Library Name For Source Member ..................          (O)

 Output Library Name For $SFGR Load Member ..............          (O)
```

   You can use this display to enter or change any SDA sign-on parameter. Defaults are displayed, but you can enter your own parameters in place of the defaults. (See Appendix C.)

3. If you still did not enter a source member name (parameter 1), the following message will appear on the display screen:

   SDA-0001 ENTER NAME OF MEMBER TO CREATE OR PROCESS

   If you want to accept the default (SCRNSPEC for formats, SCRNSP for menus), press the Enter/Rec Adv key. Otherwise, enter the source name to be processed if parameter 1 is needed by the SDA function being selected.

   If the system is in ideographic mode, you must use nonideographic characters to name source members and formats. Source member names or format names can be up to eight characters long and must begin with the characters A through Z, or #, @, or $. The remaining characters can be any combination of alphanumeric characters. Source, menu, or format member names cannot contain commas (,), single quotes ('), blanks, question marks (?), slashes (/), or hypens (-). Source, menu, or format members cannot have the names ALL, DIR, NEW, or SYSTEM, and should not have a name that has $ or # in the first position of the name.

4. Screen messages and prompts issued by SDA are ideographic if the work station is in ideographic mode. Operator responses to the SDA ideographic messages must be alphanumeric.
5. If you do not enter a $SFGR load member name, $SFGR is not called to generate specifications for the format and no load member is created.

SDA MENU

The first display presented by SDA is a menu of the SDA program functions. The SDA menu appears as follows:

On the 1920-Character Display:

```
                        SDA MENU


      ENTER THE NUMBER ASSOCIATED WITH THE OPERATION YOU WOULD
      LIKE TO PERFORM:

      1 CREATE A NEW $SFGR/WSU SOURCE MEMBER
      2 ADD TO AN EXISTING $SFGR/WSU SOURCE MEMBER
      3 UPDATE AN EXISTING $SFGR/WSU SOURCE MEMBER
      4 DISPLAY THE FORMATS IN AN EXISTING $SFGR OBJECT MEMBER
      5 DELETE A FORMAT FROM AN EXISTING $SFGR/WSU SOURCE MEMBER
      6 UPDATE EXISTING $SFGR/WSU SOURCE STATEMENTS VIA SEU
      7 BUILD A MENU INTERACTIVELY
      8 BUILD WSU PROGRAM OR RPG II SPECIFICATIONS FOR WORKSTN FILE

                                                                    _

      COL IND MODE?  ENTER Y OR N.  DEFAULT IS Y..................... Y
      WSU FORMAT MEMBER? ENTER Y OR N. DEFAULT IS N.................. N
      AUTOMATIC PROMPTING? ENTER Y OR N. DEFAULT IS N................ N

                COMMAND FUNCTION KEY 7 TO END JOB
```

On the 960-Character Display:

```
                              SDA MENU
1 CREATE A NEW $SFGR/WSU SOURCE MEMBER
2 ADD TO AN EXISTING $SFGR/WSU SOURCE MEMBER
3 UPDATE AN EXISTING $SFGR/WSU SOURCE MEMBER
4 DISPLAY THE FORMATS IN AN EXISTING $SFGR OBJECT MEMBER
5 DELETE A FORMAT FROM AN EXISTING $SFGR/WSU SOURCE MEMBER
6 UPDATE EXISTING $SFGR/WSU SOURCE STATEMENTS VIA SEU
7 BUILD A MENU INTERACTIVELY
8 BUILD WSU PROGRAM OR RPG II SPECIFICATIONS FOR WORKSTN FILE
ENTER OPTION NUMBER      _       COL IND MODE? ENTER Y OR N. DEFAULT IS Y..... Y
WSU FORMAT MEMBER? ENTER Y OR N. DEFAULT IS N.............................. N
AUTOMATIC PROMPTING? ENTER Y OR N. DEFAULT IS N............................ N
```

Enter the number associated with the program option you want to perform. The chapters in this book correspond to the option selection numbers.

The first display also asks three questions and indicates the default answers.

COL IND MODE? ENTER Y OR N. DEFAULT IS Y.

Enter Y to enable the Column-indicator (COL IND) mode of SDA. This mode is used for the create, add, and update options. Column indicators and the active screen name are displayed on line 1, and line 1 is not available for entry when this mode is enabled. Enter N to work with all 24 (1920-character display) or 12 (960-character display) lines of the display. Command function key 8 can be used to show whether the Blank or Attribute screen is active when the Column-indicator mode is disabled.

WSU FORMAT MEMBER? ENTER Y OR N. DEFAULT IS N.

Enter Y to cause SDA to generate the S- and D-specifications used by WSU. Enter N to cause SDA to generate the S- and D-specifications used by $SFGR.

Note: Because SDA places data in columns 15 through 18, 23, 24, and 26 in the generated D-specifications, warning messages WSU-0111 and WSU-0262 are issued when these D-specifications are compiled in a WSU program. Data is placed in these columns for the update option of SDA.

AUTOMATIC PROMPTING? ENTER Y OR N. DEFAULT IS N.

Enter Y to enable automatic override prompting. This is used for the create, add, and update options. SDA will display the field attributes for each input and output field that will contain execution time data. You can change any item on the display. Enter N to disable automatic prompting.

Select your menu option and ensure that the questions are answered correctly; then press the Enter/Rec Adv key. The first display of the option you select will appear on the display screen. (If you entered anything other than a number from 1 through 8, the SDA menu is redisplayed.)

Help displays are available at any time while you are using SDA. In addition, command function keys can be used to modify certain SDA functions and alter the sequence of others. These topics are discussed in the following sections of this chapter.

SDA attempts to diagnose some errors when data is entered. When a syntax error occurs, the data in error is redisplayed in reverse image. When there is a relational error between two or more fields, those fields blink. When there are fields with required entries that are left blank, the entire prompt and any data you entered is redisplayed. Correct the error by retyping the corrected response or by deleting the response and taking the default.

Options 1, 2, 3, and 5 provide a source statement resequence option. This allows you to select whether or not to have the first five columns of your source statements renumbered (starting with 00010 and incrementing by 10).

HELP DISPLAYS

SDA provides you with two levels of help:

- A help menu that allows you to select displays that define many of the basic functions of the SDA program. (The SDAH command is described below.)

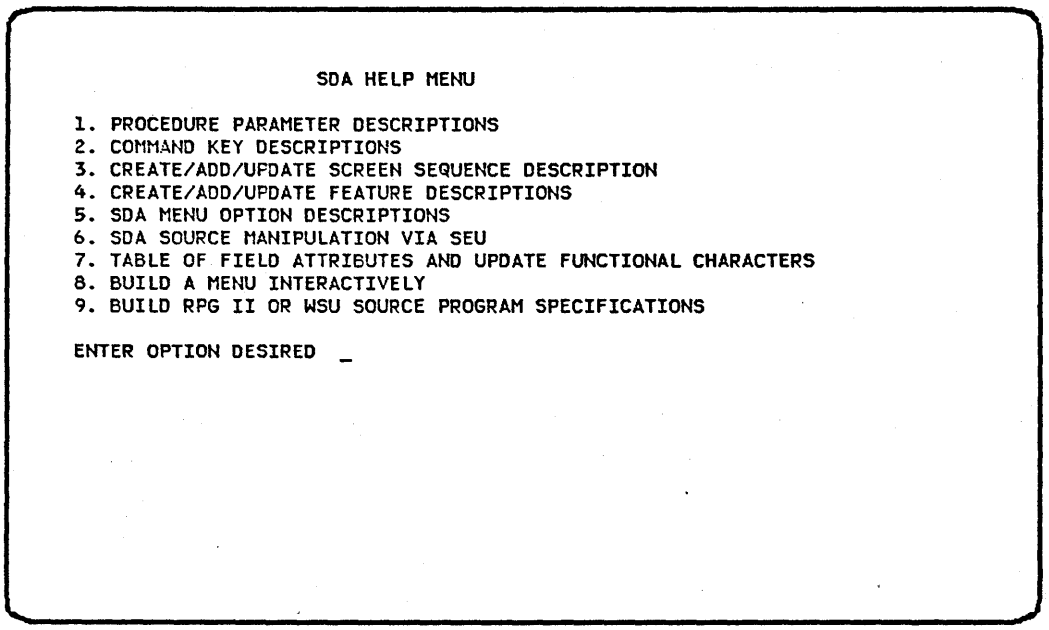
- Help displays that provide basic information about the current SDA session and basic descriptions of the SDA create and update functions (the Help key function).

There are two ways to display the help menu using the SDAH command:

1. At sign-on, enter SDAH on the Command display.

2. At any other time during SDA program operation:
   a. Press the Attn key.
   b. Take the 1 option.
   c. Enter: SDAH
   d. Select the needed help option from the help menu.
   e. End SDAH with command function key 7.
   f. Resume the interrupted task with command function key 1.

The help menu appears as follows:

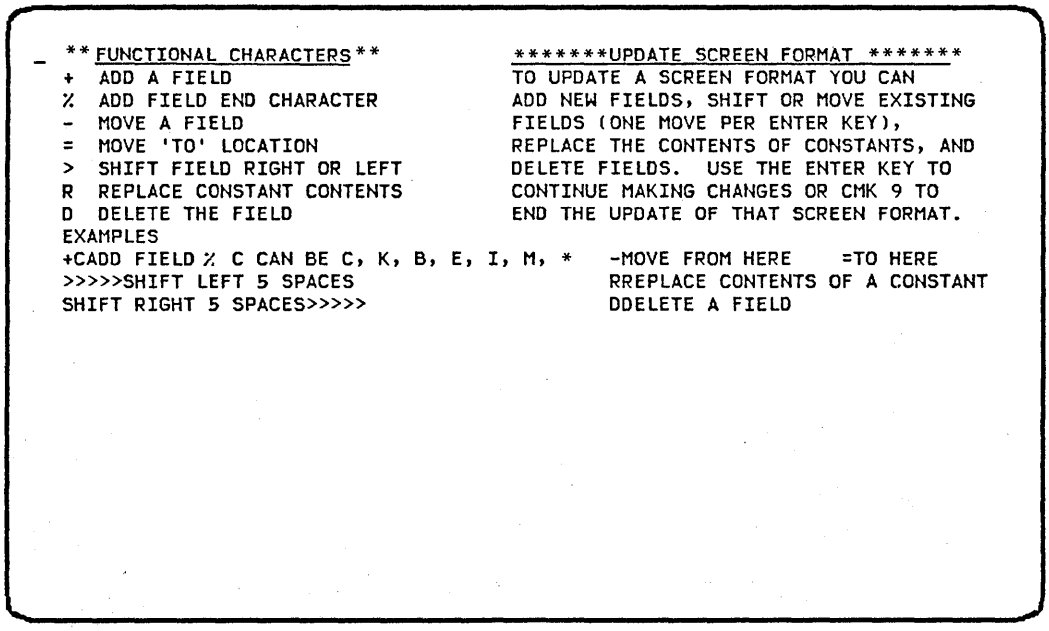


SDA also provides you with two help displays that can be called up any time the S, Blank, or Attribute screen is being displayed. Pressing the Help key when one of these screens is being displayed causes the following help screen to appear.

```
SOURCE MEMBER ..... XXXXXXXX *  *** CREATE - PROMPT SCREEN SEQUENCE ***
INPUT LIBRARY ..... XXXXXXXX *  1-FORMAT SCREEN - YOU SUPPLY $SFGR 'S'
$SFGR MEMBER ...... XXXXXXXX *    SPEC INFORMATION.  FORMAT NAME IS THE
OUTPUT LIBRARY .... XXXXXXXX *    ONLY REQUIRED ENTRY.          (CMK 9).
$SFGR LIBRARY ..... XXXXXXXX *  2-BLANK SCREEN - LAY OUT YOUR SCREEN
PRINT 1=ON,0=OFF    ..... X *    AS YOU WANT IT TO APPEAR.      (CMK 9).
**************************** *  3-ATTRIBUTE SCREEN - YOU DEFINE FIELD
ATTRIBUTES .... C,K,B,E,I,M,*      ATTRIBUTES, AND FIELD LENGTH FOR EACH
EXAMPLE - (CONSTANT)               FIELD (SEE EXAMPLE).          (CMK 9).
          CACONSTANT)T           4-ATTRIBUTE OVERRIDE SCREEN - YOU ENTER
 USE THE 'SDAH' PROCEDURE FOR      ADDITIONAL FIELD ATTRIBUTES.  ACTIVATED
 MORE DETAILED HELP TEXT.          BY AUTO PROMPT OR '*' ATTR.    (ENTER)
```

This display shows the SDA sign-on parameters, indicates whether SDA will print any output it produces, reviews the field attributes, and outlines the order of the various screens that appear during SDA options 1 and 2. The key you press to exit each screen is displayed in parentheses.

Pressing the Enter/Rec Adv key causes the second help screen to appear as shown below.



This display reviews the special attribute characters that can be used only during SDA option 3, describes briefly the way you can update a screen format, and shows a few examples of how to update fields.

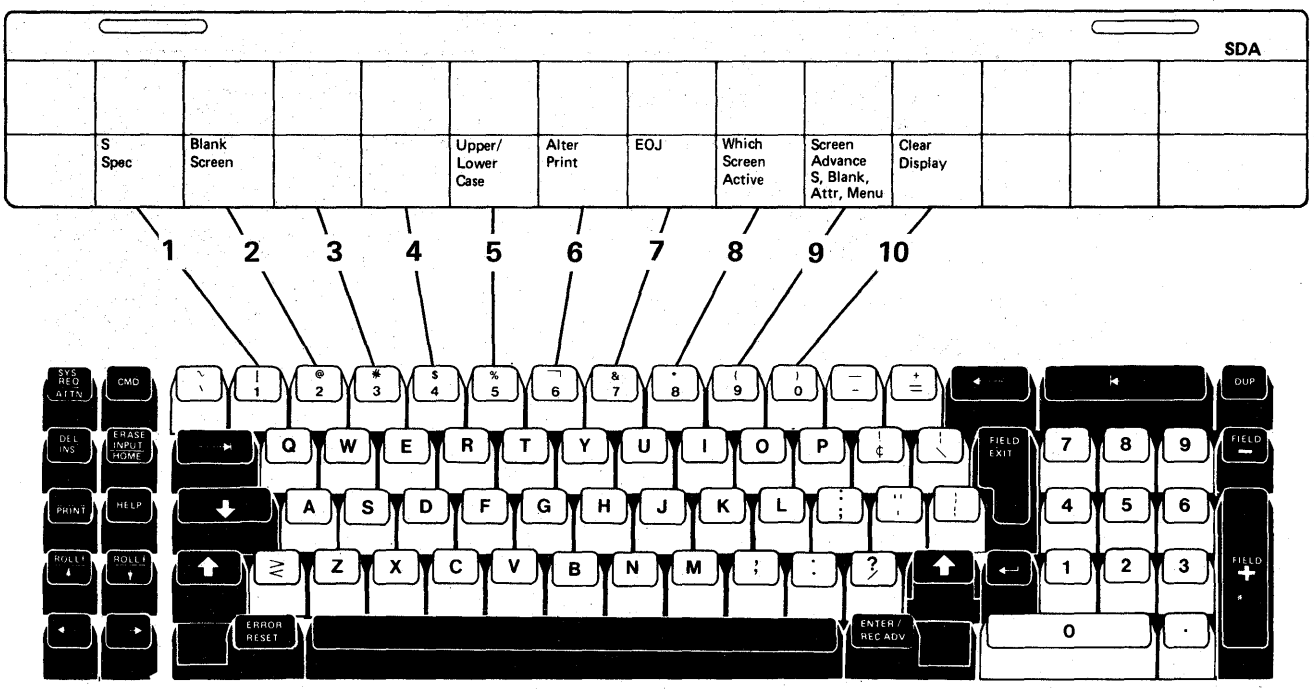
Pressing the Enter/Rec Adv key a second time causes the screen you were working on when you pressed the Help key to reappear.

SDA COMMAND FUNCTION KEYS AND TEMPLATE

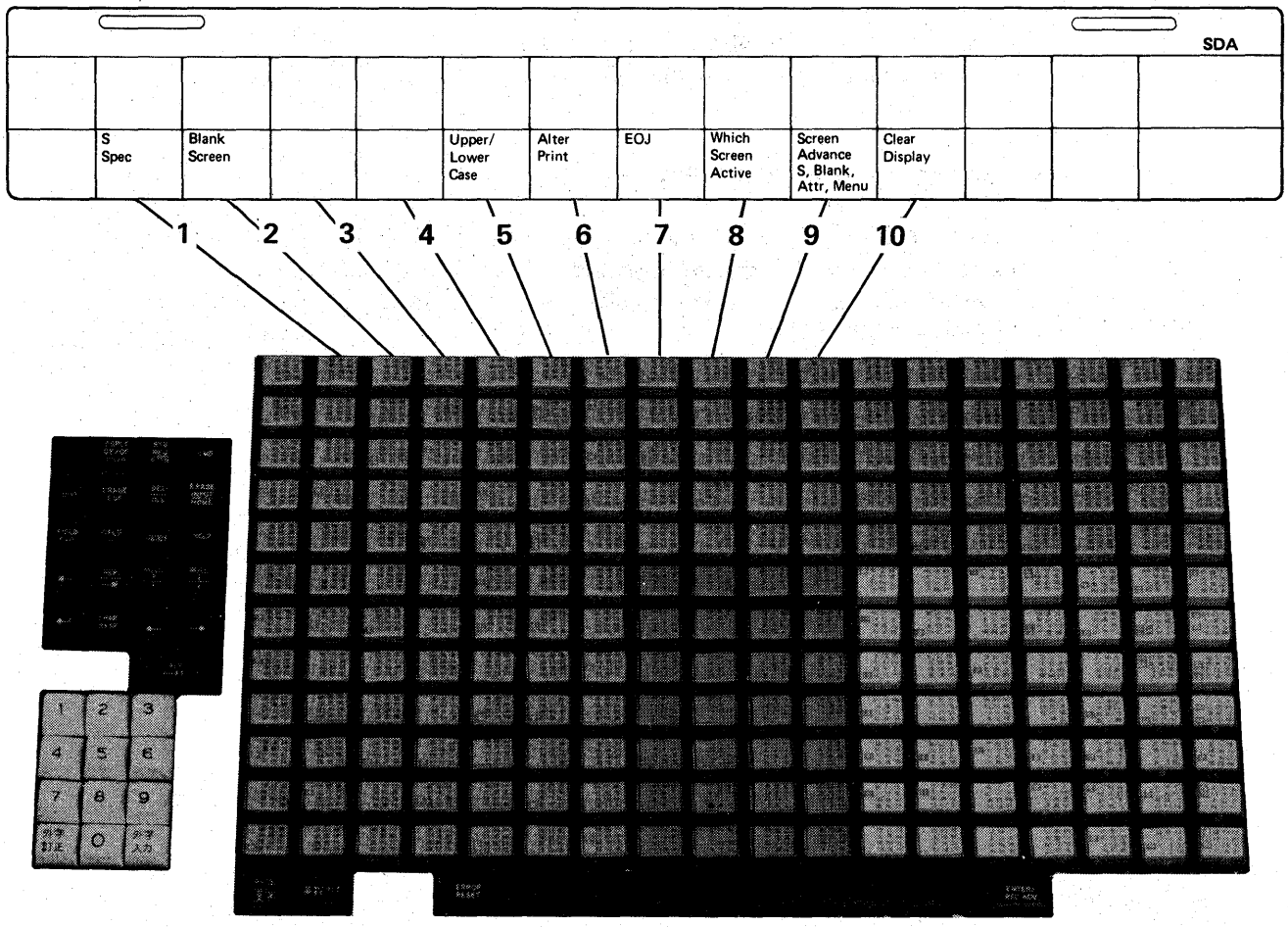
SDA supports the command function key operations shown on the SDA portion of the *IBM System/34 Keyboard Template*, GX21-7660. These command function keys let you modify certain SDA functions and alter the sequence of others.

The template and command function keys appear as follows for nonideographic and ideographic keyboards, respectively.

Nonideographic Keyboard



Ideographic Keyboard



The SDA command function keys have the following meaning:

Command Function Key	Definition
1	Return to the S-specification display and begin the cycle again. This key performs the Enter/Rec Adv function only when pressed during SDA option 3.
2	Display the Blank screen. This key performs the Enter/Rec Adv function only when pressed during SDA option 3.
3	Not used by SDA.
4	Not used by SDA.
5	Allows use of lowercase letters. These letters are valid on the Blank screen and on a blank menu display. Lowercase letters can be printed by the IBM 5256 Printer and by the IBM 5211 Printer with a 96-character belt. (See note 2 below.) This key performs the Enter/Rec Adv function only when pressed during SDA option 3. In update mode (option 3), the Attribute screen allows use of lowercase letters without the use of this key.
6	Reverse the print status. If SDA information is being printed, command function key 6 will suppress printing, and vice versa. Printing is on the system list device. The current print status can be determined from the first help display (that is, when the Help key is pressed during the S, Blank, or Attribute screens of SDA options 1, 2, or 3). The initial condition does not print.
7	End of job. If you press command function key 7 after you have selected a menu option, the option is terminated (the update or menu build options allow you to either terminate or continue). If you press command function key 7 while the SDA menu is displayed, SDA is terminated.
8	For the create, add, or update options, command function key 8 tells you whether you are using the Blank or Attribute screen. The halt message tells you which display is active; take the 0-option to return to the current operation.
9	Use to exit from the S-specification, Blank screen, Attribute screen, and menu build displays.
10	Use when displaying formats to blank the screen before the next format is displayed.

Notes:
1. Command function keys 1, 2, and 6 are valid only on S, Blank, and Attribute displays.
2. Command function key 5 is valid only on Blank, Attribute, and menu displays. (On the Attribute display, command function key 5 displays the Blank screen and allows lowercase letters to be used.)
3. A command function key is processed as an Enter/Rec Adv key on the system Input-Output display.

SDA SIGN-OFF

Use command function key 7 to end SDA:

- While a menu option is active, command function key 7 terminates the option.
- When the SDA menu is displayed, command function key 7 terminates SDA and returns you to the Command display.

SDA DISPLAYED MESSAGES

SDA messages are described in the *Displayed Messages Guide*.

SDA requires special handling for two halts: FILE FULL and LIBRARY FULL. Recovery must be done at the display station where the failure occurred.

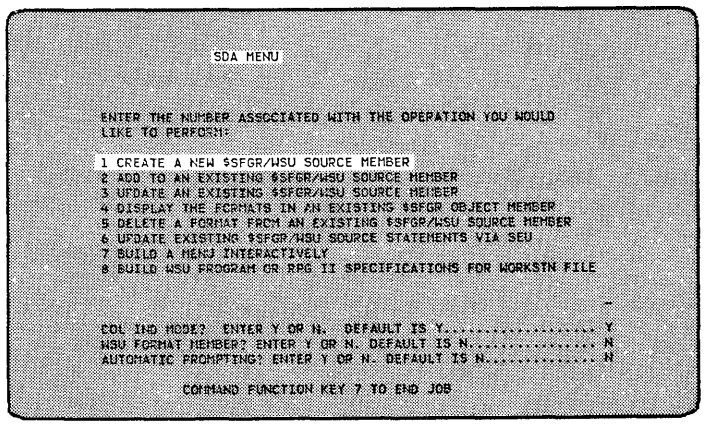
File Full Halt

SDA supports a source member of up to 5000 source statements. Take the 2-option to the halt and follow the recovery procedure described in Appendix A.

Library Full Halt

Take the 3-option to the halt, condense the library, and follow the recovery procedure described in Appendix A.

Chapter 1. Create a New $SFGR/WSU Source Member



After you select the option to create a new $SFGR/Work Station Utility (WSU) source member, the following occurs:

1. SDA prompts for general display information (the S-specification fields), and you enter them.

2. You enter the layout of the display on a blank display screen.

3. You enter the attribute codes for each field on the attribute screen.

4. SDA prints an image of the display (optional).

5. You enter additional field attributes and overriding data (optional).

6. SDA writes all specifications for this format to a work file, optionally prints the specifications, and repeats the cycle of 1 through 6 until you terminate the option.

7. You indicate whether or not you want the source resequenced, and SDA writes the work file back to the source member.

Chapter 8 and Appendix B show how you can use SDA to create a WSU program.

Figure 1-1 shows the logic flow of the create and add functions of SDA, and the following text describes steps 1 through 7 in detail.

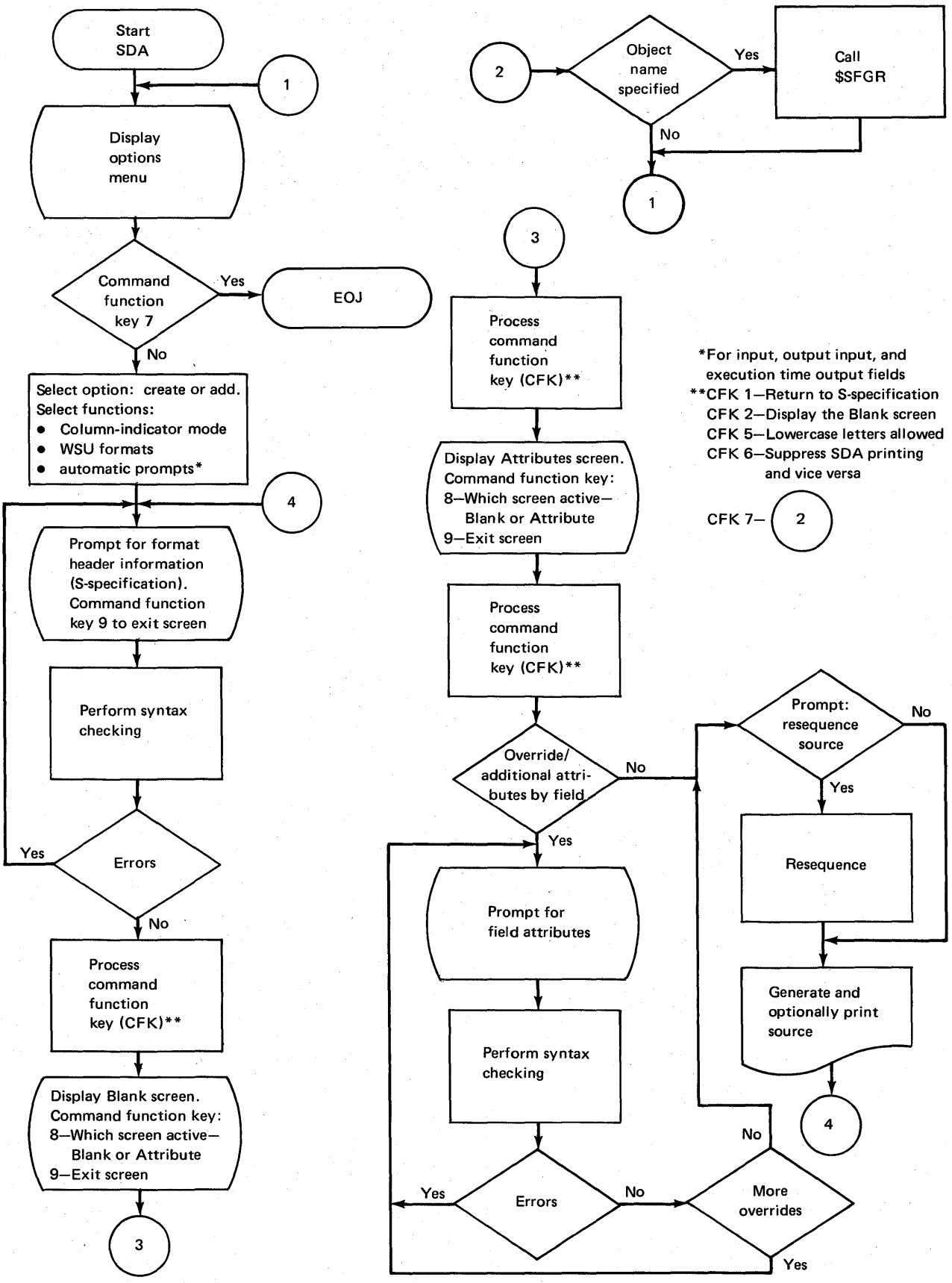
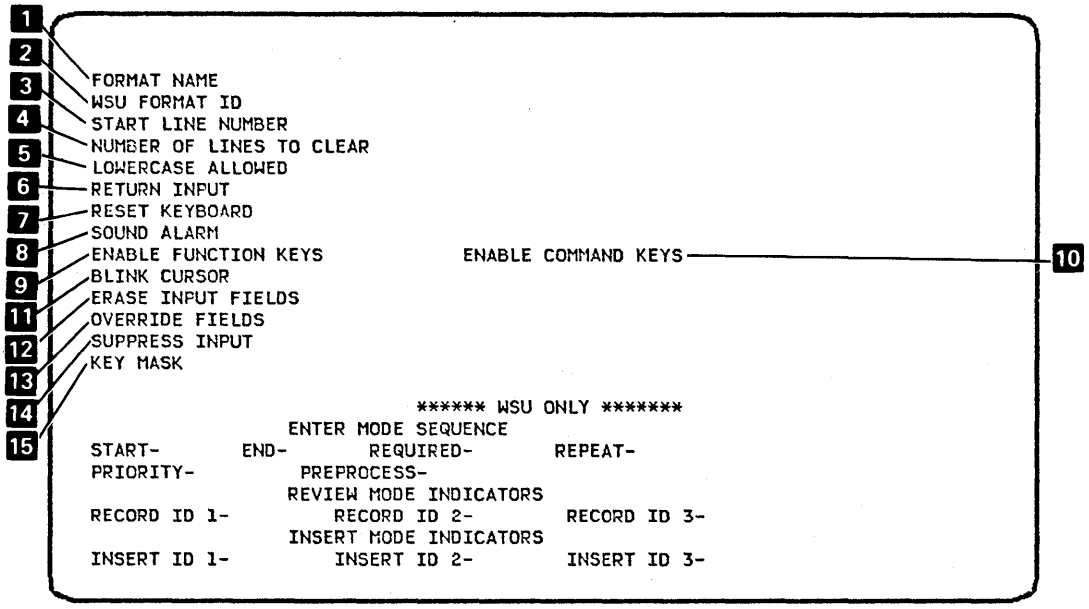


Figure 1-1. Logic Flow of the Create and Add Functions of SDA

S-SPECIFICATION FIELDS

Figure 1-2 is the S-specification display.

On the 1920-Character Display:



On the 960-Character Display:

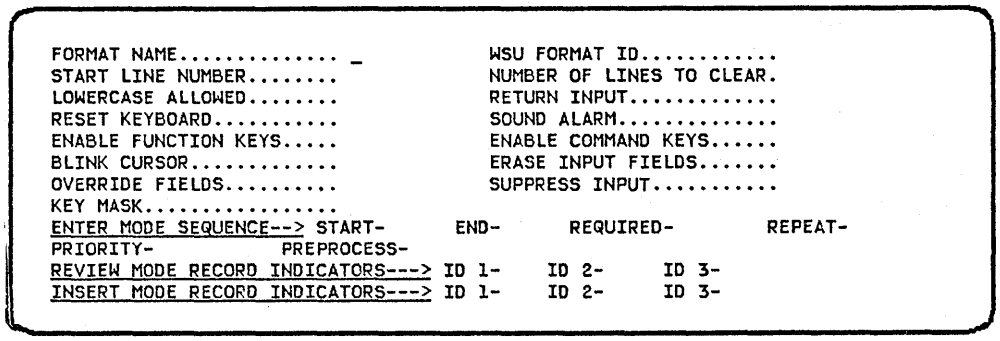


Figure 1-2. S-Specification Display

The entries on this display are defined as follows:

1 *Format Name:* The name of the format being defined. The format name can be any combination of alphanumeric characters and must be no longer than eight characters. The first character must be alphabetic (A-Z), #, $, or @. The format name cannot contain commas (,), single quotes ('), or imbedded blanks. The format name should not contain $$ in the first two positions of the name. Avoid naming formats ALL or LIST. SDA DISPLAY (option 4) and DELETE (option 3) use LIST and ALL as keywords. Duplicate format names cannot be used in the same load member, and should not be used in the same source member.

2 *WSU Format ID:* Work station utility format identifier.

3 *Start Line Number:* The line on the display where this format is to begin. Valid entries are V for variable, or a line number no greater than the number of lines on the display screen. If V is specified, a number can be entered in a prompt of the Display Call Up Utility display. The default is line 1. Leading zeros are not required, but the number must be right-justified. If you use this field, lay out the display relative to line 1 of the blank screen as if line 1 were the start line number.

4 *Number of Lines to Clear:* The number of lines, beginning with the start line, that are to be set to blanks before this format is displayed. The default is 24. Leading zeros are not required, but the number must be right-justified.

5 *Lowercase Allowed:* Lowercase letters are valid. Enter Y for yes, N for no; the default is N.

6 *Return Input:* Return all input fields to the user program even if no data keys are pressed. Enter Y for yes, N for no; the default is Y.

7 *Reset Keyboard:* WSU only. The keyboard is enabled to allow input to this display. Enter Y for yes, N for no; the default is Y.

8 *Sound Alarm:* The alarm should be sounded when this display appears. Enter Y for yes, N for no, or a number (xx) as the indicator; the default is N. The number must be right-justified.

9 *Enable Function Keys:* Used with numeric entries in the key mask. The enable function keys determine which function control keys are allowed. The numeric entries can be in any order.

Entry	Description
Y	Enable function control keys in the key mask. If the key mask contains no numbers, all function control keys are disabled.
N	Disable function control keys in the key mask. If the key mask contains no numbers, all function control keys are enabled.
R	Retain the function control key mask that is active for the display station. Use the key mask when this format is displayed.
Blanks	All function controls are enabled. The key mask must not contain any numbers.

Control Keys Used by the Key Mask

Function* Control Key	Number	Comments
Print	1	If disabled, the Print control key will perform its normal functions. If not disabled, it will function as other enabled function control keys.
Roll Up	2	
Roll Down	3	
Clear	4	
Help	5	If the display station is not in the error mode, and the help key is enabled, the help key will act as other enabled control keys.
Home (record backspace)	6	Before this can be used as an enabled control key, the cursor must be returned to the home position.

*Not all function keys are supported by all languages. Refer to the *IBM System/34 System Support Reference Manual.*

10 *Enable Command Keys:* Used with alphabetic entries in the key mask. The enable command keys determine which command keys are allowed. The alphabetic entries can be in any order.

Entry	Description
Y	Enable the command function keys in the key mask. If the key mask contains no alphabetic characters, all command function keys are disabled.
N	Disable the command function keys in the key mask. If the key mask contains no alphabetic characters, all command function keys are enabled.
R	Retain the command function key mask that is active for the display station. Use the key mask when this format is displayed.
Blanks	All command function keys are enabled. The key mask must not contain any alphabetic characters.

Alphabetic Characters and Command Keys Used by the Key Mask

Command Key	Alphabetic Characters
1 through 14	A through N
15 through 24	P through Y

11 *Blink Cursor:* Whether to blink the cursor for this display. Enter Y for yes, N for no, an indicator number (xx) for an indicator; the default is N.

12 *Erase Input Fields:* The erase input fields entry allows the program to erase the input fields and output/input fields on a display and to reset the keyboard by setting an indicator and redisplaying the format. The format is not transmitted to the display station. You might want to request erase input fields when an application requires an operator to enter information into the same display time after time.

If an indicator (01 through 99) is specified, an erase input fields operation can be performed for this format. Input fields are erased and the keyboard is reset if the specified indicator is on when the format is displayed; all other fields are unchanged. A normal put operation is performed if the indicator is off when the format is displayed.

If Y (yes) is specified, an erase input fields operation occurs every time this format is displayed. Ordinarily, Y should not be specified since all entries on the following field definition specifications are ignored when the format is displayed. Instead, if an erase input fields operation may be performed for this format, an indicator should be specified.

If N (no) is specified or the entry is left blank, an erase input fields operation is not allowed for this format.

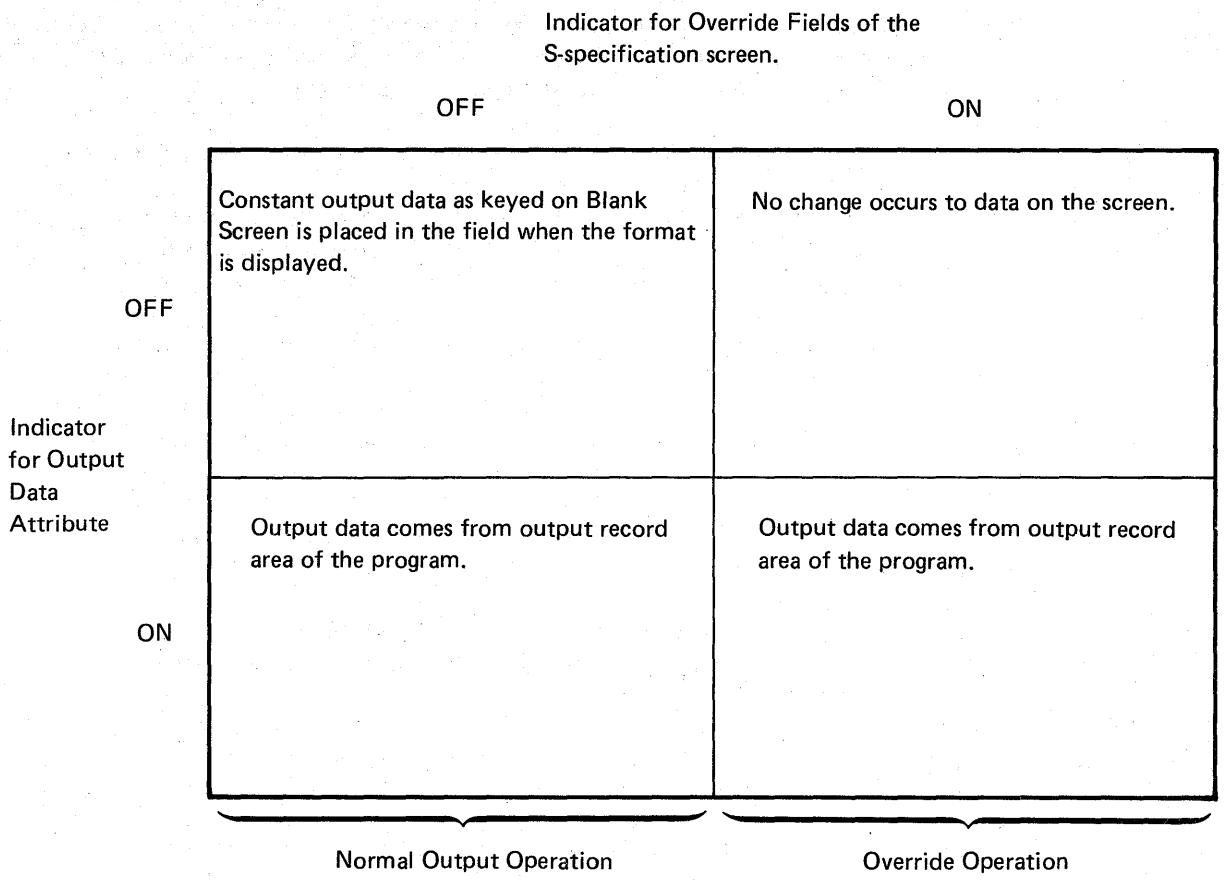
Note: If the entry causes an erase input fields operation to occur and there are no input fields currently defined on the screen, a display station error occurs.

13 *Override Fields:* An override operation allows you to replace data in output fields when the same format is redisplayed.

Entry	Description
Y	An override operation is performed every time the format is displayed.
N or blank	An override operation is not performed. A normal output operation will occur.
Indicator (values 01-99)	An override operation is performed when the indicator is on.

Notes:
1. All field attributes not controlled by an indicator are unchanged.
2. The *protect field* attribute in the attribute screen that is controlled by an indicator is ignored during an override operation.
3. An override operation on a format not currently displayed causes unpredictable results because only a portion of the format is sent to the work station when the override operation is done.

The following chart summarizes the effect of indicators on constant output data during an override operation.



14 *Suppress Input:* Whether to suppress input (yes) or return input (no) to the user program. Enter Y for yes, N for no, an indicator number (xx) for an indicator; the default is N. (WSU does not support this field.)

15 *Key Mask:* A string of numbers and/or alphabetic characters that identify keys to be enabled or disabled when this format is displayed. The field is up to 16 characters long and cannot contain embedded blanks. The numbers and alphabetic characters can be in any order.

The remaining entries are for control within WSU programs. See the *WSU Reference Manual* for details on these fields.

After you make the needed entries to the S-specification display, press command function key 9. If there are errors, the fields in error will blink, and you can reenter the data.

BLANK SCREEN

The Blank screen allows you to lay out your display format. When the display is in Full-screen mode, this display is completely blank; when the display is in Column-indicator mode, line 1 shows the column numbers and the display title. Figure 1-3 shows an example of a Blank screen when the display is in Column-indicator mode; the screen layout is complete.

The Blank screen can have a mixture of both ideographic fields and nonideogprahic fields.

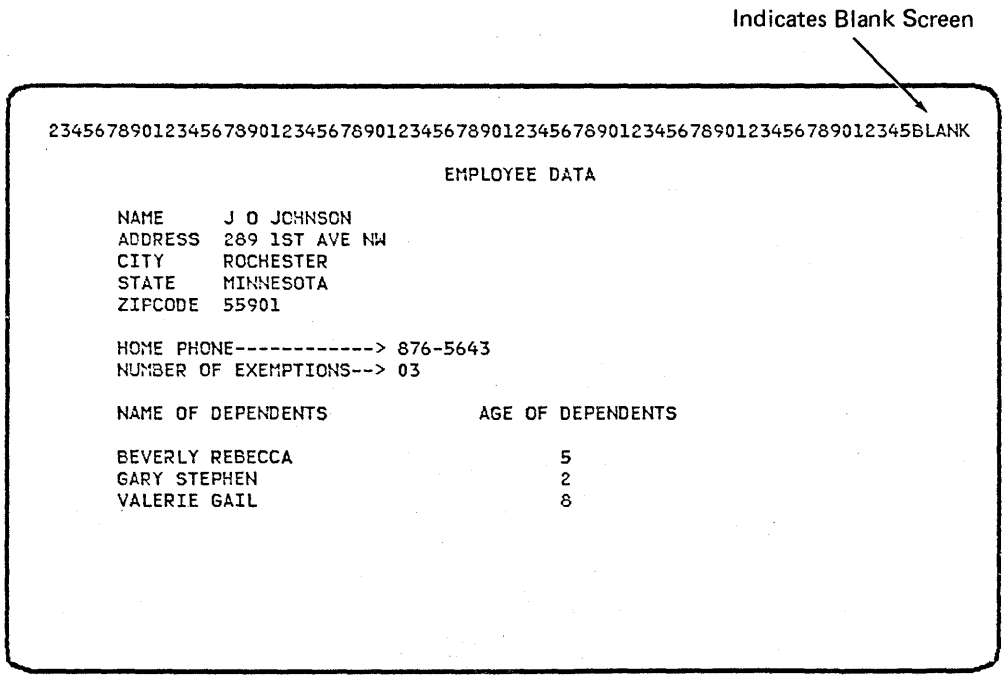


Figure 1-3. Completed Display Layout on a Blank Screen in Column-Indicator Mode

When the Blank screen appears, use the entire display screen (except for the line with column numbers across the top when the display is in Column-indicator mode) as a work area to lay out the display. SDA needs one blank position before each field on the display for attributes. In addition, nothing can be entered in columns 1 or 2, line 1. So the first field cannot start before column 3 of line 1.

Line 1 on the Blank screen corresponds to the starting line number on the S-specification. For example, if you specified a starting number of 12, the first line of this screen appears on line 12 of the actual display. Therefore, the number of lines for the display is limited to the number of remaining lines, (in this example, 13 lines remain; that is, lines 12-24).

If, when laying out the display, you want to duplicate lines, enter single quotes (') in both columns 1 and 2 below the line to be duplicated. SDA will duplicate that line for you. However, if you are coding WSU, do not use a single quote in a constant (prompt). SDA recognizes a single quote as a single character; internal quotes in WSU P-constants will terminate that field prematurely if you do an SDA format update.

When you complete the display, press command function key 9. This causes the image just entered to be redisplayed for attribute placement.

Note: Anything entered into line 1 when the Column-indicator mode is active will be ignored.

Ideographic fields that start on one line and continue onto the next line of the display can cause problems if a character is split by the end of the line. When building ideographic fields that will extend onto more than one line, you should start the field so that the ideographic shift-out character is in an even-numbered column on the screen.

When laying out Message Identification Code (MIC) fields, place the MIC number (4 digits) followed by the message member identifier (2 digits) in the first six positions of the field. The rest of the field is left blank and should be large enough to contain the message. The field type should be M on the Attribute screen, with no data type attribute, and a T or t should be used to indicate the end of the field. The following chart indicates which message member identifiers are associated with the message members containing the messages.

Identifier	**Message Member Containing the Message**
U1 or blank	User-1 message member
U2	User-2 message member
P1	Program-1 message member
P2	Program-2 message member
M1	SSP level-1 message member (##MSG1)
M2	SSP level-2 message member (##MSG2)

Note: For additional information on MIC fields, see *Constant Data* in the $SFGR section of the *System Support Reference Manual.*

ATTRIBUTE SCREEN

The attribute screen allows you to define the attributes of the fields for your display format. Two characters are used to define field attributes. Character 1 indicates the field type, such as input field, execution-time output field, or input/output field. This first character is placed in the space before each field on the screen. If you omit the field type attribute, the field is defined as a normal-intensity output constant field.

If the field you are defining has input capabilities, you must define a second attribute for the data type. Character 2 indicates what type of data is to be keyed into the field. Except for ideographic fields, this character is placed immediately after the field type attribute and overlays the first character of the field on the attribute screen. If you omit the data type attribute, and the first character of the field is not N or S, the field's data type is defined as alphanumeric.

If you want additional field attributes, such as underline, reverse image, or color, place an * as the field type attribute. SDA will prompt you via the override screen for the attributes you desire.

The following charts show valid attribute characters and how SDA interprets them.

Character 1 on Attributes Screen (Field Type)

Field Type Desired	Data Type Previously Entered on Associated Blank Screen	Character 1 (control character)
Output Constant	Either ideographic or alphanumeric	c
Output/input constant		k
Alphanumeric	Alphanumeric	
Ideographic	Ideographic shift-out character	
Execution time output data	Either ideographic or alphanumeric	e
Output/input data		b
Alphanumeric	Alphanumeric	
Ideographic	Ideographic shift-out character	
Input only		i
Alphanumeric	Alphanumeric	
Ideographic	Ideographic shift-out character	
Message identification code (MIC) output constant	Either ideographic or alphanumeric	m
All other attributes (use override screen)	Either ideographic or alphanumeric	*

The intensity of the displayed field is controlled by using a lowercase control character for normal intensity and an uppercase control character for high intensity.

Ideographic keyboards use the same hexadecimal representations for a control character, but may display a different attribute control character.

Character 2 on Attribute Screen (Data Type)

Data Type	Character 2 (control character)
Alphanumeric	a
Numeric, zero fill	n
Signed numeric, blank fill	s

The following rules apply to field attributes specified for SDA:

1. All fields must be separated by at least one blank.

2. Attributes require a maximum of two positions (the first position preceding the field and the first position of the field). The second attribute character is valid for fields defined by K k, B b, or I i attributes in character 1. The override field attribute screen is used to define the second attribute for fields that are defined in the ideographic mode. The screen displays additional attributes for the following conditions:
   a. The work station is in ideographic mode.
   b. First attribute characters of K, B, and I are used for a field.
   c. The ideographic shift-out character is the first character of the field, and/or a second attribute character that is invalid or that is not recognized by SDA is keyed.

   For example, on the display in Figure 1-3 you have a field that will contain a phone number:

   876-5643

   This field is an input alphanumeric field. Therefore, starting in the blank immediately preceding the field, you enter *ia*. (If the field begins in column 1, enter the first attribute in column 80 of the preceding line.) The field on the display will now appear:

   ia76-5643

   Do not be concerned that the 8 has been overlaid by the attribute. This will not affect the finished format.

3. The second character is ignored when you specify C c, E e, or M m for character 1.

Note: A field containing a mixture of alphanumeric and ideographic characters is supported by SDA. If the ideographic data in the field is composed of extended ideographic characters, you should be aware of the following considerations:

- If the field starts with an alphanumeric character, the extended ideographic characters are shown as an invalid ideographic symbol when the object format is displayed by either SDA option 4 or a user program.

- You should define the field containing a mixture of alphanumeric and extended ideographic characters as two separate fields: one field containing the alphanumeric data and one field containing the ideographic data. An ideographic shift out character should be the first character of the ideographic field.

4. Fields missing a first attribute or having an attribute not recognized by SDA will default to output constant of normal intensity.

5. There are three ways to indicate where a field ends; you can do the following:
   a. Enter a T (uppercase or lowercase) in the blank position immediately following the last character of the field. The example from step 2 would then appear as follows:

      ia76-5643t

   b. Enter the field attribute for the next field if only one blank separates the fields. In this case, a T is not needed. For example, you have

      CHECK NUMBER 1234

      on the display and these are two separate fields.

      CHECK NUMBER is an alphameric constant and will default to c. 1234 is an input only field with field characteristics *in* (normal intensity, numeric input). The display screen would show

      CHECK NUMBERin234t

      after the attributes and a terminating *t* following the second field have been entered.

   c. Let SDA insert an implied T if the field is meant to include all remaining display screen positions through column 80 of the last line on the display.

      Note: $SFGR errors may occur if a start line number other than 1 was entered on the S-specification.

Figure 1-4 is another example of how attributes are interpreted by SDA.

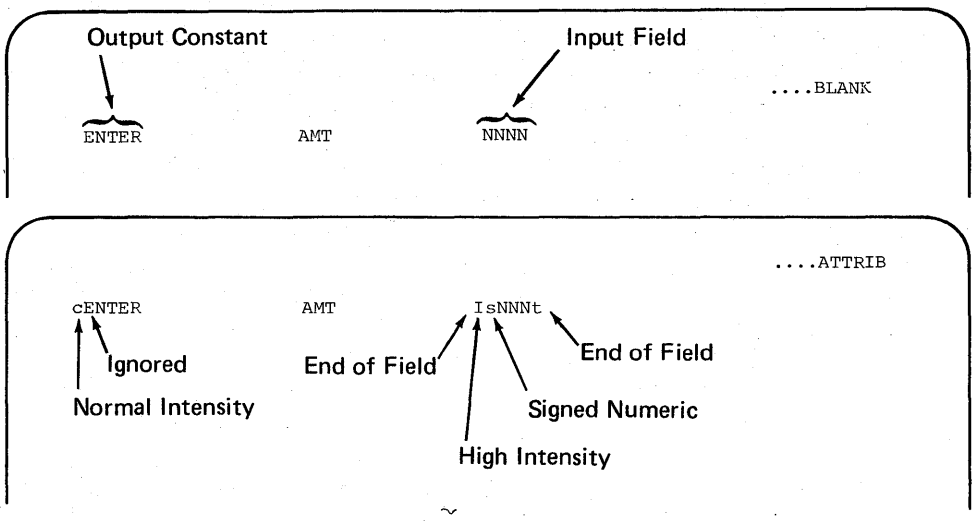


Figure 1-4. Attribute Placement

Figure 1-5 shows how the display of Figure 1-3 appears after you have entered the field attributes and terminating *t*s. If two lines are the same, enter single quotes (') in both columns 1 and 2 below the line to be duplicated. SDA will duplicate that line for you. Only lines that were duplicated on the Blank screen should use the duplicate attributes feature on the Attribute screen.

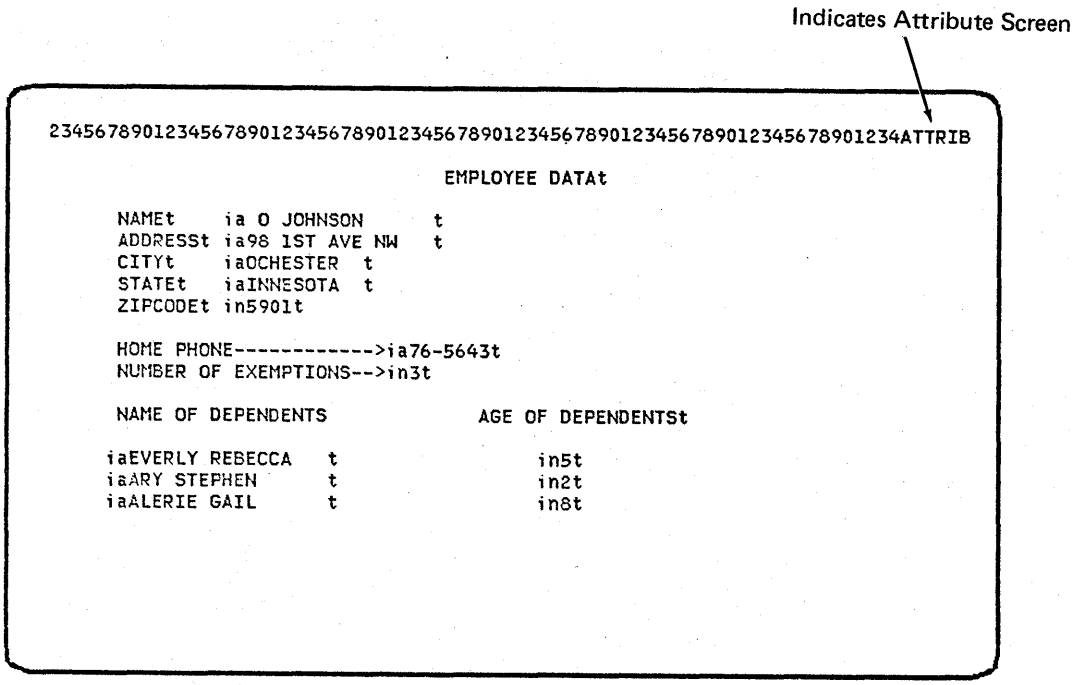


Figure 1-5. Attribute Screen in the Column-Indicator Mode After Attributes Have Been Entered

ADDITIONAL FIELD ATTRIBUTES AND OVERRIDING DATA

The SDA Field Attributes display appears:

- If automatic prompting of field attributes was requested on the SDA menu, the first input or execution time data field (I, E, B, or K attribute) that you defined on the Blank screen is displayed in reverse image (with any attributes that you entered on the Attribute screen), and you can change attributes for every field. You are prompted to change other I, E, B, or K fields in the format in the order in which the fields appear on the screen (left to right, top to bottom). You will be prompted for any field with an asterisk (*) in the first attribute position.

- If asterisks were entered on the Attribute screen and automatic prompting was not selected, the first field with an asterisk in the attribute position is displayed in reverse image. You can then change that field. You are prompted to change any other asterisked fields; the changes are made in the order in which the fields appear on the screen. You will not be prompted for any other fields in this format.

  On the Blank screen during an ideographic session, a field with the first attribute characters of K, B, or I, and the second attribute either missing or undefined, is displayed in reverse image on the screen. SDA asks for additional attributes for the field.

  Prompting does not occur if data type attributes of N, A, or S are used with field type attributes of K, B, or I.

After you change field attributes and press the Enter key, the S-specification display appears.

Note: If you are entering additional field attributes but do not want syntax checking performed on a specific field, enter Y for the following prompt:

ENTER Y TO BYPASS SYNTAX CHECKING.

Lines 5 through 8 of the 1920-character display and lines 2 through 5 of the 960-character display contain up to 256 bytes of data from the display image associated with the field being overridden (that is, the field is being defined further than input allowed, output data, or constant type). This field is shown in reverse image to distinguish it from other fields. In Figure 1-6, NAME is the field for which the overriding data is being entered. This data cannot be changed. On the remaining lines, you can enter overriding data.

The field name generated by SDA can be overridden on this display. You may want to do this if you are generating formats for WSU or are planning to create an RPG skeleton program.

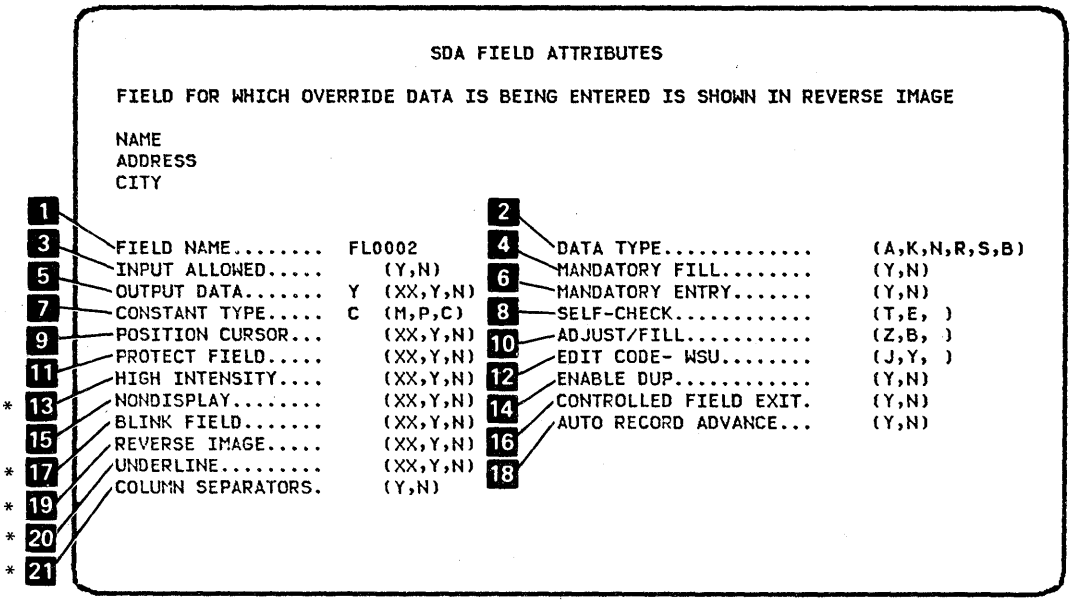
Valid input values are displayed in parentheses on the 1920-character display only. An xx value indicates an indicator number. The rightmost valid option is the $SFGR default. A blank for self-check indicates a non-self-check field. A blank for adjust/fill indicates blank fill for signed numeric; no fill for all other types of fields. A blank for edit code indicates no editing.

If you used an asterisk as an attribute for this field, be sure to differentiate between an output constant (c) and program execution time output (blank) by filling in the constant type.

Press the Enter/Rec Adv key when all overriding data associated with the field has been entered. If the attributes blink, an error has occurred. Reenter the correct attributes.

Figure 1-6 shows an example of the override Field Attributes display.

On the 1920-Character Display:



On the 960-Character Display:

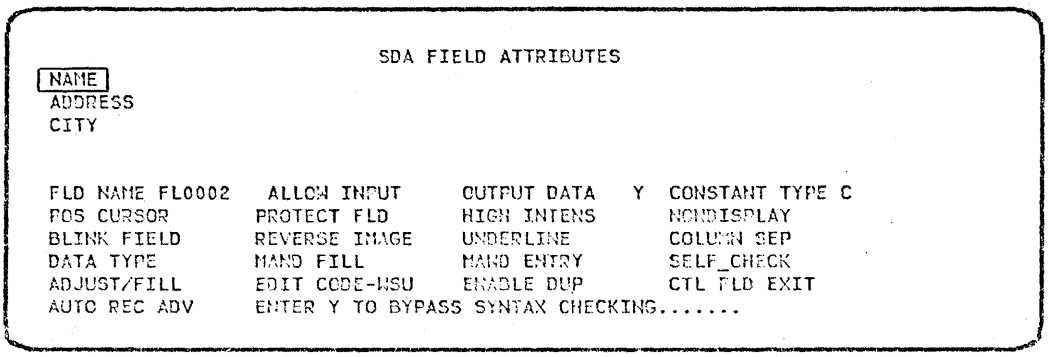


Figure 1-6. Override Data for Field Attributes

*High intensity, blink field, and column separator attributes are combined to generate color control attributes for system displays capable of color.

The override field attributes are defined as follows:

1 *Field Name:* The field name gives a unique name to every field specified on the screen.

2 *Data Type:* This attribute identifies the type of data that can be placed in an input field. The data type attribute cannot be specified for an output field.

Data Type	Contents of Field
A	Alphabetic data only.
N	Numeric data only: 0-9, comma (,), period (.), positive (+), and negative (-).
B or blanks	Alphanumeric data only.
S	Signed numeric data only. The last position of the field is reserved for a sign which can be either positive (+) or negative (-). Use the Field+ and Field Exit keys to enter a positive value. Use the Field- key to enter a negative value. Use the Field Exit key to exit from the field.
K	Katakana characters.
R	Data read from the magnetic stripe reader. Specify the nondisplay attribute also.
X	Ideographic characters only.
E	Operators can enter alphanumeric and Katakana characters or ideographic characters, but not both. The field is initially filled with zeros.
F	Operators can enter alphanumeric and Katakana characters or ideographic characters, but not both. The field is initially filled with ideographic nulls (shift-out, followed by zeros, followed by shift-in).

Notes:

1. When you specify signed numeric data, field attributes of adjust/fill and control field exit with entries of Y (yes) are assumed.
2. If a negative number is sent as output to a signed numeric field, the minus sign (-) normally is displayed along with the number. (See *Erase Input Fields*, in this chapter.)
3. When you specify B (right adjust, blank fill) for the adjust/fill attribute, the leading zeros in a signed numeric field are replaced by blanks.
4. X, E, and F data types are used for systems with ideographic character support.

3 *Input Allowed:* If you specify Y, the field is an input field. If you specify N, or leave the entry blank, the field is not an input field.

4 *Mandatory Fill:* If you specify Y, the field must have all positions filled if at least one character is entered from the keyboard. If you specify N, or leave the entry blank, the field does not have to be filled.

Keys that position the cursor can be used to exit from a mandatory fill field. This will result in no automatic adjusting for that field.

5 *Output Data:* If you specify Y, the field is an output field. If you specify N, or leave the entry blank, the field is not an output field.

The following condition is true when Y is specified for the output data attribute:

- If constant type attribute of M is specified, the screen displays the message identified by the message identification code (MIC) and the message member identifier in the user program output record area.

The following conditions are true when an indicator (values 01 through 99) is specified for the output data attribute:

- If the indicator is off and the user program performs an override operation, the field will not be changed.

  If the indicator is on and the user program performs an override operation, data supplied by the user program or the message identified by the user program will be displayed in the field.

- If the indicator is on and a constant type attribute of M is specified, the screen then displays the message identified by the message identification code (MIC) and the message member identifier in the user program output record area.

- If the indicator is on and the constant type attribute is not M, then data from the user program output record area is displayed.

The following conditions are always true:

- If the field is specified as an output field only, the data in the field cannot be changed by the work station operator. N or blank in the input-allowed attribute identifies this condition.

- If an output field is also defined as an input field, the data in the field can be changed by the display station operator. Y in the input-allowed attribute identifies this condition.

Note: User programs must reserve space in their output record area if an indicator is specified for the field. If M is specified for attribute of constant type, only 6 bytes need be reserved.

6 *Mandatory Entry:* If you specify Y, the display station operator must enter at least one character in the field before input from the display can be returned to the application program.

If you specify N, or leave the entry blank, the field can be left blank. You can bypass a mandatory entry field in the following ways:

- If all input fields are mandatory entry fields, and the return input entry attribute on the S-specification screen is Y, and the work station operator does not enter data into any of the input fields.
- If the return input entry attribute on the S-specification screen is N and the work station operator does not enter data in any of the input fields.

7 *Constant Type:*

Type*	Meaning
C	Constant information is to be displayed.
M	The contents of the message identified by the message identification code is displayed.
P	The field is a WSU prompt field.

8 *Self-Check:* The information entered into the field is verified by a check algorithm. Self-check fields cannot be larger than 32 positions.

The self-check field is composed of two parts: a base number and a check digit. When using the self-check field, you must calculate the check digit for each field you want verified and include the check digit as the last digit of the number. When you enter the field on the display screen and the check digit you produced does not match the check digit that the system calculates, an error condition has occurred.

Modulus 10, when T is specified, detects the incorrect entry of a single number or a single transposition of a digit of the base number.

Modulus 11, when E is specified, can detect the same errors as well as double transpositions.

If you do not specify anything, the field is not a self-check field.

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*If the constant type entry is left blank, any constant data defined for the field is ignored.

9 *Position Cursor:* The position cursor entry explicitly places the cursor at one of the input fields in the screen format. If you specify Y, the cursor appears at the first position of the field. Only one field can have Y specified on the display. If you specify N, or leave the entry blank, the cursor will be at the first position of the field only under the following conditions:

- The field is the first unprotected input field on the display.
- No field on the display has Y specified.
- No field has an indicator that is on.

Indicator entries range from 01 to 99. The cursor appears in the first position of the first field with an indicator that is set to on.

10 *Adjust Fill:* If you specify Z (right-adjust, zero fill), then information in the field is adjusted to the right end of the field and the unused leftmost positions are filled with zeros.

If you specify B (right-adjust, blank fill), then information in the field is adjusted to the right end of the field and the unused leftmost positions are filled with blanks. If signed numeric fields are used as output, the leftmost zeros of the field are replaced by blanks.

If this attribute is not specified right-adjust, blank fill is assumed on input for signed numeric fields and no adjust, no fill is assumed for all other fields.

If you specify the Adjust/Fill attribute, Y is assumed for the Control Field Exit attribute.

Notes:

1. Adjust/Fill and Mandatory Fill attributes cannot be specified for the same field.
2. Field+, Field-, and Field Exit keys are used to enter numeric data for a field that is to be an adjust/fill field.
3. An adjust/fill will not occur if the Field Advance key is used to enter numeric data.

11 *Protect Field:* If you specify Y, then data in the field cannot be changed and the field is bypassed.

If you specify N, or leave the entry blank, data can be entered into the field and the field is not bypassed. Indicator entries range from 01 to 99. The field will be bypassed if the indicator is on.

Notes:
1. The indicator is ignored if you specify an override operation.
2. The cursor appears in a protected field if the field is the first field defined on the display and the cursor is not positioned to any other field on the display via the Position Cursor attribute.
3. If you specify attributes of Nondisplay, Protect Field, and Column Separators, then column separators are displayed on the screen.
4. If you specify attributes of Nondisplay, Protect Field, and if you use indicators to control them, then column separators are not displayed, even when the Column Separator attribute is specified.

12 *Edit Code (WSU Only):* This attribute is meaningful only if you plan to work with WSU (Work Station Utility) programs.

If you specify J, WSU specifications for inserting commas, decimal points, and a minus sign in a numeric output field will be generated by SDA.

If you specify Y, WSU specifications for the omission of leading zeros and the insertion of slashes (/) for each pair of digits in a 3- to 6-digit number will be generated by SDA.

If you specify Z, WSU specifications for the suppression of leading (leftmost) zeros from a numeric output field will be generated by SDA.

Note: Edit codes are valid only for numeric output fields. An edited output field cannot be an input field. The input allowed attribute must not be Y.

13 *High Intensity:* If you specify Y, the field is displayed with high intensity on the screen.

If you specify N, or leave the entry blank, the field is displayed with normal intensity on the screen.

Indicator entries range from 01 to 99. The field will be displayed with high intensity if the indicator is on.

High intensity, reverse image, and underline attributes cannot be used for the same field at the same time.

If one or more entries are indicator values and you attempt to display the field, do not use the attributes of high intensity, reverse image, and underline to define the field unless you want the field to be treated as a nondisplay field.

14 *Enable/Dup:* If you specify Y, the Dup (duplicate) key can be used. When the Dup key is pressed, the unused portion of the field is filled with duplicate character values (hex 1C), which are displayed as overscored asterisks ($\overline{*}$). These duplicate characters must be processed by the user program.

If you specify N, or leave the entry blank, the Dup key cannot be used to put data into a field. If you try to use the Dup key, an error condition will occur.

15 *Nondisplay:* If you specify Y, the data does not display on the screen.

If you specify N, or leave the entry blank, data in the field displays on the screen.

Indicator entries range from 01 to 99. Information in the field is not displayed if the indicator is on.

Notes:

1. Column separators will be displayed if Y is specified for attributes of Protect Field, Column Separators, and Nondisplay for the same field.
2. Column separators will not be displayed if indicators are used for the attributes of Nondisplay and Protect Field.

16 *Controlled Field Exit:* If you specify Y, the cursor stays in the field until one of the following keys is pressed:

Field Adv
Field Exit
Field- (the field is signed numeric)
Field backspace
Erase input
Enter/Rec Adv
Field+
Home
Dup

If you specify N, or leave the entry blank, the cursor automatically exits the field when the field is filled.

If the Adjust/Fill attribute is specified, the N entry will be ignored.

17 *Blink Field:* If you specify Y, the information in the field will blink when displayed.

If you specify N, or leave the entry blank, the information in the field does not blink when displayed.

Indicator entries range from 01 to 99. Information in the field blinks if the indicator is on.

18 *Auto Record Advance:* If you specify Y, all input fields are returned to the user program as input. This automatic record advance occurs when one of the following conditions occurs:

- The last character of the last field has been entered and N or blank is specified for the controlled field exit attribute.
- The cursor is in the last input field, and the Field Adv, Field Exit, Field+, Field-, Enter/Rec Adv, or Dup key is pressed by the operator.

If you specify N, or leave the entry blank, the autorecord advance function will not be performed.

19 *Reverse Image:* If you specify Y, the field appears as dark characters on a light background.

If you specify N, or leave the entry blank, the field appears as light green on a dark background.

Indicator entries range from 01 to 99. The field appears as dark characters on a light background if the indicator is on.

20 *Underline:* If you specify Y, the field will be underlined.

If you specify N, or leave the entry blank, the field is not underlined.

Indicator entries range from 01 to 99. The field is underlined if the indicator is on.

Note: Underline, High Intensity, the Reverse Image attributes cannot all be specified for the same field at the same time. If one or more of these three attributes are specified using indicator values and you attempt to display the field with all three attributes, then the field will be treated as a nondisplay field.

21 *Column Separators:* If you specify Y, a vertical line will precede and follow each character position. The vertical lines do not occupy a character position in the field.

If you specify N, or leave the entry blank, the column separators will not appear in the field.

The Column Separator attribute used with the Nondisplay and Protect Field attributes specified as Y will result in only the column separators being displayed. If the indicators for the attributes of Nondisplay and Protect Field are on, and you specify the Column Separator attribute, column separators will not be displayed.

Note: For additional descriptions of override field attributes, see *Field Definition Specifications* in the *System Support Manual.*

COLOR ATTRIBUTES FOR 5292 COLOR DISPLAY STATION

The 5292 Color Display Station provides color attributes that can be used to highlight fields on the display.

High Intensity, column separators, and blink attributes are used for color selection in combination with other attributes as shown in Figure 1-8.

Color	Display Result	Attributes Specified				
		Blink	Column Separators	High Intensity	Reverse Image	Underline*
Green	Green					
	Green, Reverse Image				X	
	Green, Underline					X
	Green, Reverse Image, Underline				X	X
White	White			X		
	White, Reverse Image			X	X	
	White, Underline			X		X
Red	Red	X[1]				
	Red, Reverse Image	X[1]			X	
	Red, Blink	X		X		
	Red, Blink, Reverse Image	X		X	X	
	Red, Underline	X[1]				X
	Red, Reverse Image, Underline	X[1]			X	X
	Red, Blink, Underline	X		X		X
Turquoise	Turquoise, Column Separators		X[2]			
	Turquoise, Column Separators, Reverse Image		X[2]		X	
	Turquoise, Column Separators, Underline		X[2]			X
	Turquoise, Column Separators, Reverse Image, Underline		X[2]		X	X
Pink	Pink	X[1]	X[3]			
	Pink, Reverse Image	X[1]	X[3]		X	
	Pink, Underline	X[1]	X[3]			X
	Pink, Reverse Image, Underline	X[1]	X[3]		X	X
Yellow	Yellow, Column Separators		X[2]	X		
	Yellow, Column Separators, Reverse Image		X[2]	X	X	
	Yellow, Column Separators, Underline		X[2]	X		X
Blue	Blue	X[1]	X[3]	X		
	Blue, Reverse Image	X[1]	X[3]	X	X	
	Blue, Underline	X[1]	X[3]	X		X
Nondisplay	Data in fields with these combinations of attributes are not displayed when indicators are specified.	X		X	X	X
				X	X	X
			X	X	X	X
		X	X	X	X	X

[1] Blink is suppressed.
[2] Column separators are suppressed when reduced line spacing is used.
[3] Column separators are suppressed.

1. Underlines and column separators are always blue.
2. Underlines do not blink if blink field is also specified.
3. Column separators do not appear if blink field is also specified.
4. Use the *limited color* select option of the 5292 Color Display Station to see how a display format designed for color appears on a single color** display. The procedure for selecting this option is explained in the *IBM 5292 Color Display Station Operator's Guide,* GA21-9416.

*May be referred to as underscore.
**May be referred to as monochrome.

Figure 1-8. Controlling Color on a 5292 Color Display Station

USING COLOR FOR INFORMATION DISPLAY

The proper use of color in a display helps you to:

- Make headings stand out from text
- Break up large blocks of text
- Easily identify related information
- Emphasize fields or words for operator recognition
- Identify error conditions

When you use color, decide early which highlighting technique you will use. If you are programming for a combination of full color and single color displays, keep in mind the results you will get in both cases. For example, a field that is red on a full color display will only blink in a single color display. By selecting the limited color display you can preview most of the results of your color choices as they will appear on a single color display. More information can be found in the *IBM 5292 Color Display Station Programmer's Guide to Using Color,* GA21-9413.

Figure 1-9 illustrates the relationship between full color, limited color, and single color formats when generated with the same attribute controls.

Color Attributes Displayed			
5292 Color Display Station Full Color Mode	**5292 Color Display Station Limited Color Mode**	**5250 Series Display Stations Single Color Mode**	**5291 Display Station Single Color Mode**
green	green	green	green
white	white	high intensity green	high intensity green
red red, blinking	blinking green blinking white	blinking green blinking high intensity green	blinking green blinking high intensity green
turquoise with column separators	green column separators	green with vertical line column separators	green with vertical dot column separators
pink	blinking green with column separators	blinking green with vertical line column separators	blinking green with vertical dot column separators
yellow with column separators	white with column separators	high intensity green with vertical line column separators	high intensity green with vertical dot column separators
blue blue underline	blinking white with column separators green or white underline	blinking, high intensity green with vertical line column separators green underline	blinking, high intensity green with vertical dot column separators green underline

Figure 1-9. Full Color, Limited Color, And Single Color Screen Display Formats

Column separators on the 5292 Color Display Station appear as a blue dot at each lower corner of the character position. On the 5250 series of display stations, the column separators are displayed as vertical green lines on either side of each character position in the format. On the 5291 Display Station, the column separators appear as two vertical green dots on either side of each character position.

FULL-SCREEN MODE EXAMPLE

Figures 1-10 and 1-11 are examples of the Blank and Attribute screens as they appear when the display is in Full-screen mode. The only difference between the Full-screen mode and the Column-indicator mode is that the column numbers and display name are not on line 1 when the display is in Column-indicator mode. To determine which screen is active, press command function key 8. A displayed message tells you the name of the active screen. Take option 0 to return to current operations.

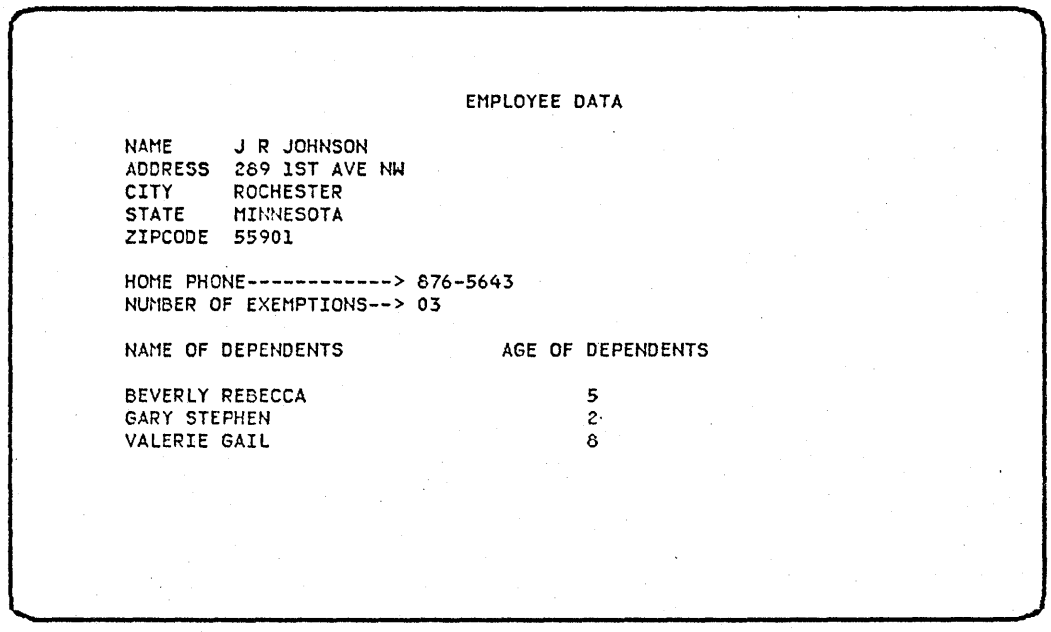


Figure 1-10. Completed Display Layout on a Blank Screen in Full-Screen Mode

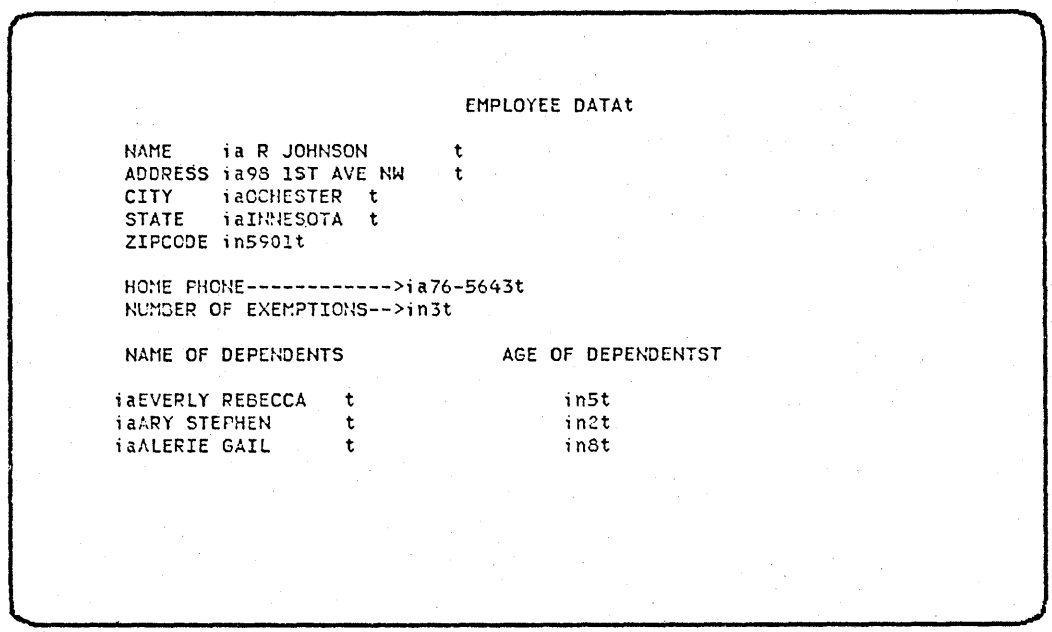


Figure 1-11. Attribute Screen in Full-Screen Mode After Attributes Have Been Entered

PRINTING OF DISPLAY IMAGE AND $SFGR SPECIFICATIONS

After you have entered *all* field attributes, press command function key 9. This will cause a copy of the display image to be printed and the $SFGR/WSU source specifications to be printed as they are generated. Fields having overrides will not be printed until the additional field attributes have been entered. Printing is on the system list device. Printing can be suppressed by command function key 6.

Figure 1-12 is an example of the generated format specifications that are based on the example in Figure 1-5.

Notes:

1. If you did not enter parameter 3 (sfgrload) on the SDA command, $SFGR will not generate specifications for the format. Run the FORMAT procedure described in the *System Support Reference Manual* if you want to create a load member.
2. If you are creating a WSU format member, do not enter parameter 3 (sfgrload).

```
SEMPMAS
DFL0001  00130336Y                          CEMPLOYEE DATA
DFL0002  00040508Y                          CNAME
DFL0003  00180517   Y
DFL0004  00070608Y                          CADDRESS
DFL0005  00180617   Y
DFL0006  00040708Y                          CCITY
DFL0007  00110717   Y
DFL0008  00050808Y                          CSTATE
DFL0009  00110817   Y
DFL0010  00070908Y                          CZIPCODE
DFL0011  00050917   YN  Z
DFL0012  00231108Y                          CHOME PHONE---------->
DFL0013  00081132   Y
DFL0014  00231208Y                          CNUMBER OF EXEMPTIONS-->
DFL0015  00021232   Y
DFL0016  00481408Y                          CNAME OF DEPENDENTS     X
D        AGE OF DEPENDENTS
DFL0017  00191608   Y
DFL0018  00021645   YN  Z
DFL0019  00191708   Y
DFL0020  00021745   YN  Z
DFL0021  00191808   Y
DFL0022  00021845   YN  Z
```

Figure 1-12. $SFGR Specifications Generated by SDA

After the display image has been printed, the S-specification appears and you can do one of the following:

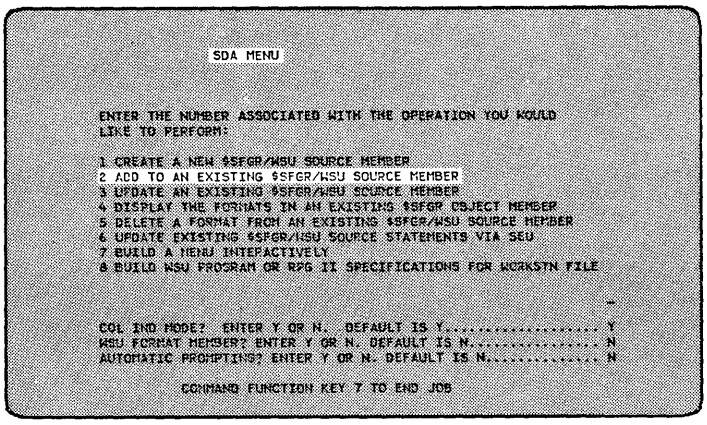
- Enter the next format (no additional attributes or overrides were requested on the current format).

- Press command function key 7 to terminate the create option. This causes the following prompt to be issued:

  DO YOU WANT THE SOURCE RESEQUENCED? (Y/N) DEFAULT IS N

  If you respond Y (yes), SDA renumbers the first five columns of the source specifications, starting with the number 00010 and incrementing by 10. If you respond N (no), no renumbering occurs. If you entered parameter 3 (sfgrload), SDA uses $SFGR to create a screen format load member.

Chapter 2. Add to an Existing $SFGR/WSU Source Member

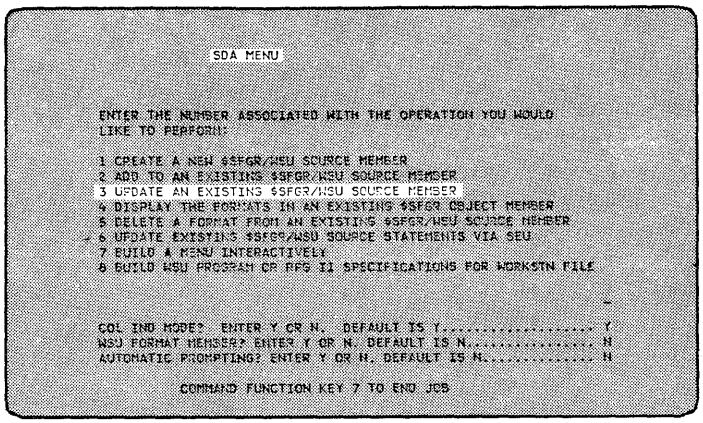


After you select the option to add to an existing $SFGR/WSU source member, the following occurs:

1. SDA copies the existing source member to a work file.
2. SDA prompts for general display information (the S-specification fields), and you enter them.
3. You enter the layout of the display on a blank display screen.
4. You enter the attribute codes for each field on an attribute screen.
5. SDA prints an image of the display (optional).
6. You enter additional field attributes and overriding data (optional).
7. SDA writes all specifications for this format to a work file, optionally prints the specifications, and repeats the cycle of 2 through 7 until you terminate the option.
8. You indicate whether or not you want the source resequenced, and SDA writes the work file back to the source member.

Note: Steps 2 through 7 are the same as steps 1 through 6 in Chapter 1.

Chapter 3. Update an Existing $SFGR/WSU Source Member



When you select the option to update an existing $SFGR/WSU source member, SDA issues the following prompts. Figure 3-3 shows the logic flow of the update function of SDA.

1. ENTER THE NAME OF THE FORMAT TO PROCESS OR ALL

   This prompt allows you to enter the name of a format to update (it is then searched for by SDA) or allows you to update all the formats. If you enter a format name, the name should be a format name that has not already been passed because the update option makes only one pass through the source statements. If you enter a format name and that format is found, SDA rebuilds an image of the display from the source specifications of the format member and displays the image on the Attribute screen (Figure 3-1). If you press the Enter key without keying a name or if you enter a format name that cannot be found, SDA issues the resequence prompt. (The update option may be selected again if multiple passes through the member are desired.) If you enter ALL, SDA issues the following prompt.

2. DO YOU WANT TO UPDATE THIS FORMAT? (Y/N) DEFAULT IS Y

   xxxxxxxx (xxxxxxxx is a format name)

   You can respond with either Y (yes) or N (no). If you respond with Y, SDA rebuilds an image of the display from the source specifications of the format member and displays the image on the Attribute screen, (Figure 3-1). If you respond with N, SDA copies the format into the work file and prompts you with the name of the next format in the source member. (If anything besides N is entered, the default Y is assumed.)

```
                              EXAMPLE INVOICE ENTRY

    NAME;;;;;;;;;;; 0000000000000000
    ADDRESS;;;;;;;; 00000000000000000
    CITY;;;;;;;;;;; 0000000000000
    STATE;;;;;;;;;; 000000000
    ZIPCODE;;;;;;;; 00000

ITEM;#;;;;;;;DESCRIPTION;;;;;;;QUANTITY;;;;;;AMOUNT

 IIII    IIIIIIIIIIIIIIIIIIII IIIIII       IIIII
 IIII    IIIIIIIIIIIIIIIIIIII IIIIII       IIIII
 IIII    IIIIIIIIIIIIIIIIIIII IIIIII       IIIII
```

Figure 3-1. Rebuilt Display Image in Full-Screen Mode

In the figure above, the output constant fields are redisplayed as they are entered in the source specifications; blanks are replaced with a semicolon (;) to indicate the length of the field. Input only fields are displayed with a capital I substituted for each position of the field. Fields that require execution time output data or fields that are MICs are displayed with a capital O substituted for each position of the field. (These fields may be output/input fields.)

The original Attribute screen used to create this example is shown in Figure 3-2.

```
                              cEXAMPLE INVOICE ENTRYt

    NAME            EABC CORPORATION    t
    ADDRESS         E1234 ANY PLACE     t
    CITY            EROCHESTER    t
    STATE           EMINNESOTAt
    ZIPCODE         E55901t

ITEM #       DESCRIPTION        QUANTITY      AMOUNTt

ia94Bt  iaOPPER TUBING FT       in   20t     in 000t
iaJ42t  iaITTINGS               in   13t     in 275t
ia476t  iaOMPOUND GAL           in    5t     in 907t
```

Figure 3-2. Original Attributes for the Display Image in Figure 3-1

Rebuilding an image from the source specifications can present some problems that SDA cannot handle:

- Fields on formats that are not in ascending row and column sequence are ignored.

- Fields on formats that
  - Are too long to fit on the screen
  - Have a length of zero
  - Have an invalid start position
  - Are not S- or D-specifications (A blank in column 6 is not an S- or D-specification.)
  - Have WSU fields with no length specified (except for P-constants)
  - Are WSU P-constants that contain internal quotes
  - Will cause the field to be ignored or will cause the rebuilding of the image to be terminated prematurely

Note: If the fields are missing on the image because of the items in the preceding list, press command function key 9 when the Attribute screen first appears. This will save the existing source. Use SEU or SDA option 6 to correct the source member.

Updating Formats on the Attribute Screen

- If you want to change only the attribute of a field, enter an asterisk (*) in the blank position preceding each field to be updated. If the field begins in the first position of a line, enter the asterisk in position 80 of the previous line. (When you press the Enter/Rec Adv key, the SDA Field Attribute screen is displayed for this field, and you can then change the field attributes.)

- If you want to delete a field, enter d or D in the blank position preceding each field to be deleted.

- If you want to replace the contents of an output constant field, enter r or R in the blank position preceding each field to be changed and type the new contents over the contents you want replaced. SDA removes any semicolons (;) it finds during the replacement. If a semicolon is intended to be a part of the constant, you must use SDA option 6 or SEU to insert the semicolon. The length of the field remains the same, and any characters typed past the end of the field are not included in the source member for that field.

To replace alphanumeric data with ideographic data, you should first delete enough of the alphanumeric field to accommodate the ideographic material, and then add the ideographic data by using the field add function.

- If you want to move a field to a different part of the screen, enter - in the blank position preceding the field to be moved. Enter = in a blank position to indicate the field's new starting position; that is, the first character of the field will overlay the = character. Only one field can be moved each time you press the Enter/Rec Adv key. A field cannot be moved so that it ends in the last position or extends past the last position of the screen.

- If you want to shift the position of a field to the left, enter > in the blank position(s) immediately preceding each field to be shifted. One > is required for each position through which the field is to be shifted. A field should not be shifted to the last position of a 960 screen unless the shifted field is an output data only field with no special override attributes.

- If you want to shift the position of a field to the right, enter > in the blank position(s) immediately following each field to be shifted. One > is required for each position through which the field is to be shifted.

- If you want to add a new field, enter + in a blank position *two positions* in front of the new field's starting position. Enter one of the character 1 field attributes (either c, C, k, K, e, E, b, B, i, I, m, M, or *) immediately after the + to indicate the field type. Enter the contents of the new field, and enter % to indicate the ending position of the new field. Added fields are given the name FAnnnn, where nnnn is a four-digit number starting at 0001 that is incremented by one for each added field. Fields added during separate update sessions may have the same field name because of the way SDA names the added fields.

  Notes: The work station operator should be aware of the following conditions when an ideographic field is added to an existing screen format:
  1. Because you key the ideographic field in the insert mode, you should use the Delete or Field Exit keys to provide space for the characters you intend to add to the screen format.
  2. When you use the Delete key, be sure to delete as many blank positions as are required for your insert.

Mixing Ideographic and Alphanumeric Characters

An output constant field containing a mixture of alphanumeric and ideographic characters is supported by SDA. If the ideographic data in the field is composed of extended ideographic characters, you should be aware of the following considerations:

- When the field starts with an alphanumeric character, the extended ideographic characters are shown as an invalid ideographic symbol when the object format is displayed by either SDA option 4 or a user program.

- When you want leading alphanumeric characters, you should define the input containing the mixture of alphanumeric and extended ideographic characters as two separate fields: the first field containing the alphanumeric data and the next field containing the extended ideographic data.

If you intend to either add an ideographic field to an existing screen format or shift the position of an ideographic field, or to move an ideographic field to a new part of the screen with the field extending beyond the end of the line on the screen and continuing on the next line, make sure the field is positioned to begin in an even-column number. This is to make sure that ideographic characters are not split across a line boundary.

Finishing the Update

Pressing the Enter/Rec Adv key (also command function keys 1, 2, or 5) causes SDA to make the desired update(s). There is no limit to the number of fields that can be updated each time you press the Enter/Rec Adv key (except as stated above). One of the following then occurs:

- If field attribute changes were performed, SDA issues the SDA Field Attributes screen for each field that was updated or replaced. If a new field was inserted and auto prompt was specified, SDA issues the SDA Field Attributes screen for all inserted fields with attributes *, B, E or K. (Each field for which you may enter attributes is displayed in reverse image.) You may enter or change any attribute except input allowed, output data, and constant type. After all the SDA Field Attributes screens have been issued, SDA then redisplays the Attribute screen with all updates performed to allow for more updates.

- If fields were deleted, moved, or shifted, SDA redisplays the Attribute screen with all updates performed to allow for more updates.

- At least one space must separate fields. If requested updates:
  - Move, shift, or insert new fields that would overlap or leave no space between existing fields, or
  - Move or insert ideographic fields that extend to another line, but do not start in an even-column number. The ideographic shift-out character is not in an even-column number, or
  - Move, shift, or insert new fields that would start in the first position of the screen or extend past the end of the screen, then the error updates are ignored and cause SDA to redisplay the Attribute screen (with the valid updates performed) and the following message:

    UPDATE ERROR - FIELD INSERTION/SHIFT/MOVE IGNORED.

When you finish updating this format, press command function key 9. SDA then prints the image of the screen as it was before any updates were performed, the image of the screen after all updates are performed, and the $SFGR S- and D-specifications (unless no printing is requested because command function 6 was pressed when the Attribute screen was being displayed).

SDA then reissues prompt 1 or 2, depending on how you responded to prompt 1 previously. If all the formats have been updated or copied, SDA issues the prompt below. If you press command function key 7 while updating a format, SDA issues a message option 0 or 1. Option 0 ignores the command function key and returns to updating the format. Option 1 causes the format being updated to be completed, copies all other formats, and issues the following prompt:

DO YOU WANT THE SOURCE RESEQUENCED? (Y/N) DEFAULT IS N

You can respond with either Y (yes) or N (no). If you respond with Y, SDA renumbers the first 5 positions of the source specifications, beginning with 00010 and incrementing by 10. If you respond with N, SDA does not renumber the source specifications. SDA then places the source member in the output library and returns to the SDA menu.

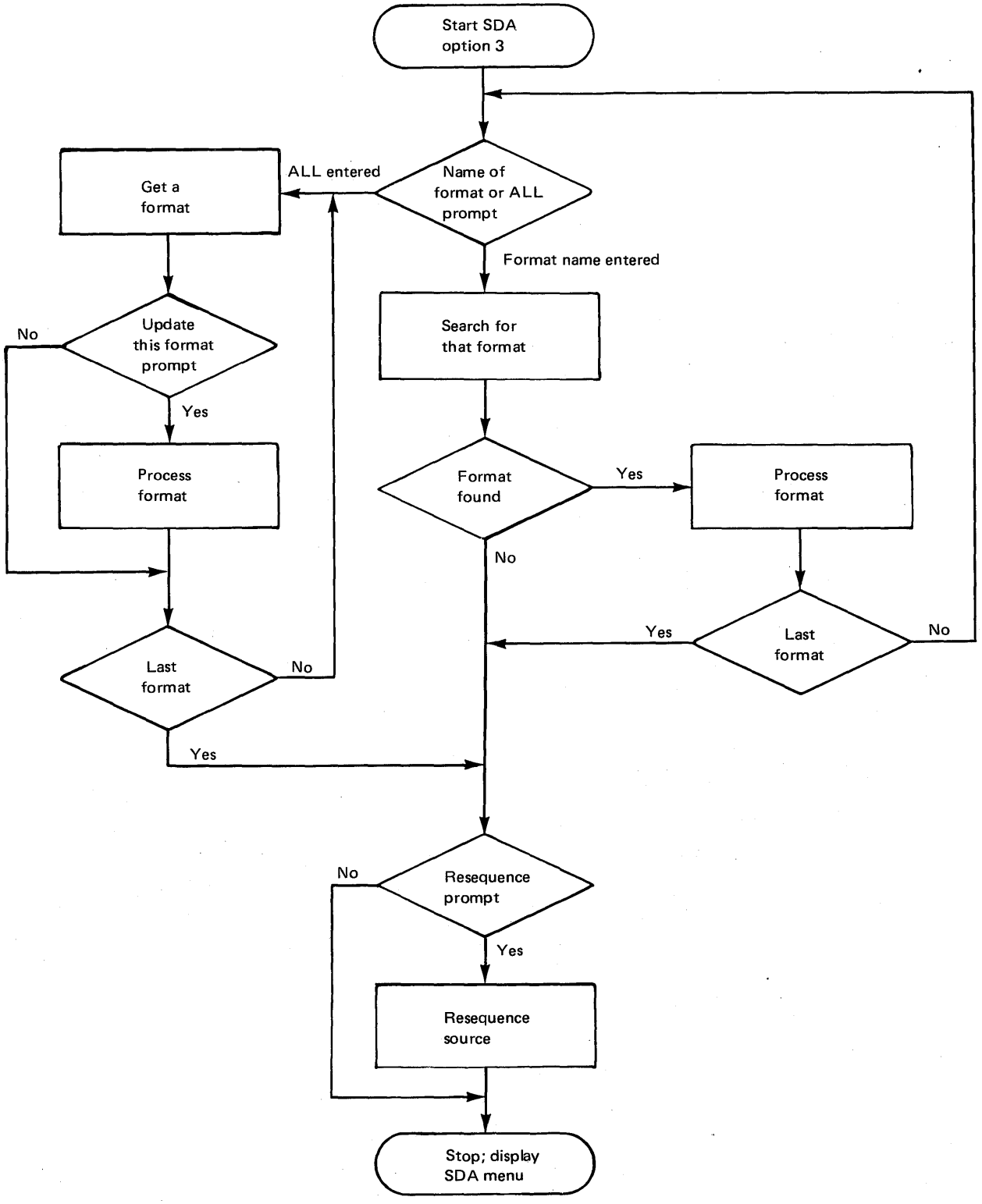
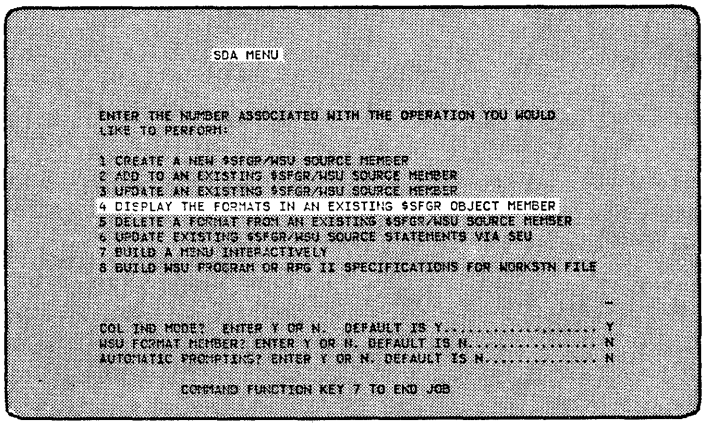


Figure 3-3. Logic Flow of the Update Function of SDA

Chapter 4. Display the Formats in an Existing $SFGR Object Member



When you use the option to display the formats in an existing $SFGR object member, SDA prompts you for the load member name and the name of the format you want displayed. If the load member is not in the currently specified library (see parameter 2 of the SDA sign-on screen), you must restart SDA and specify the proper library. You can supply variable start line numbers with this option. Figure 4-1 shows the prompt display.

On the 1920-Character Display:

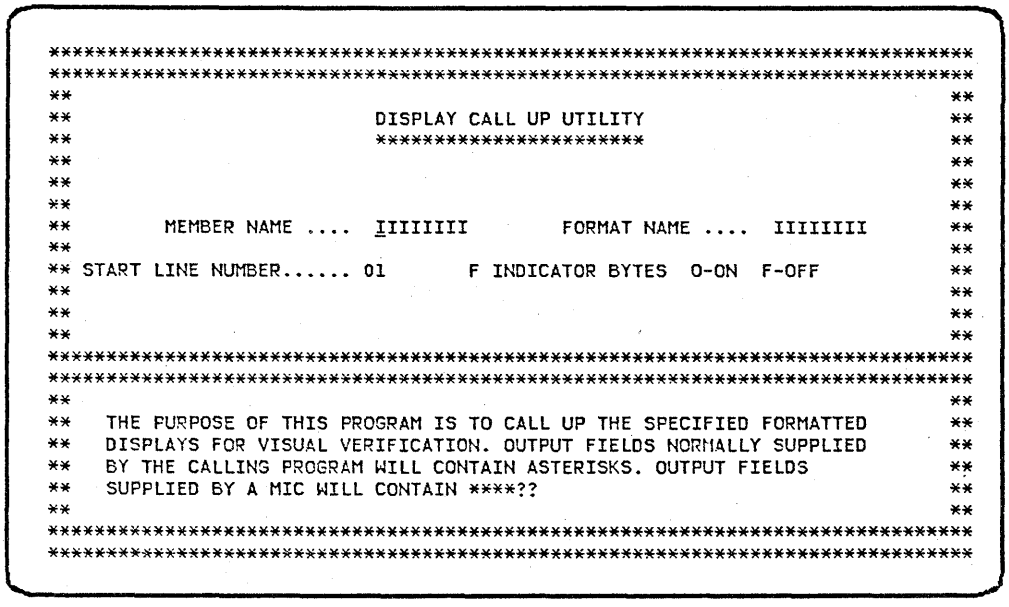


Figure 4-1 (Part 1 of 2). Display Call Up Utility Display

On the 960-Character Display:

```
**********************************************************************************
**                          DISPLAY CALL UP UTILITY                             **
**                                                                              **
**        MEMBER NAME ....  IIIIIIII        FORMAT NAME ...   IIIIIIII         **
** START LINE NUMBER..... 01       F INDICATOR BYTES  0-ON  F-OFF              **
**                                                                              **
**********************************************************************************
**   THE PURPOSE OF THIS PROGRAM IS TO CALL UP THE SPECIFIED FORMATTED           **
**   DISPLAYS FOR VISUAL VERIFICATION. OUTPUT FIELDS NORMALLY SUPPLIED           **
**   BY THE CALLING PROGRAM WILL CONTAIN ASTERISKS. OUTPUT FIELDS               **
**   SUPPLIED BY A MIC WILL CONTAIN ****??                                      **
**********************************************************************************
```

Figure 4-1 (Part 2 of 2). Display Call Up Utility Display

If you enter ALL in the format name field, all formats in the format member starting with the first format are displayed. Press the Enter/Rec Adv key or command function key 10* to display the next format. The Enter/Rec Adv key blanks only the number of lines specified as lines to be cleared on the S-specification. Command function key 10 blanks all the lines before the next format is displayed.

If you enter ALL Cxx (xx is 01 to 99) in the format name field, each format is displayed for xx seconds. SDA then automatically displays the next format. (Always enter two digits of seconds. SDA interprets C1 as 10 seconds.)

If you enter LIST in the format name field, the names of all formats in the member are displayed. Figure 4-2 shows the list display.

```
DISPLAY OBJECT MEMBER LIST
**************************


 OBJECT MEMBER .... XXXXXXXX

 FORMAT NAMES

 XXXXXXXX        XXXXXXXX        XXXXXXXX        XXXXXXXX
 XXXXXXXX        XXXXXXXX        XXXXXXXX        XXXXXXXX
 XXXXXXXX        XXXXXXXX        XXXXXXXX        XXXXXXXX
 XXXXXXXX        XXXXXXXX        XXXXXXXX        XXXXXXXX
 XXXXXXXX        XXXXXXXX        XXXXXXXX        XXXXXXXX
 XXXXXXXX        XXXXXXXX        XXXXXXXX        XXXXXXXX
 XXXXXXXX        XXXXXXXX        XXXXXXXX        XXXXXXXX
 XXXXXXXX        XXXXXXXX        XXXXXXXX        XXXXXXXX
```

Figure 4-2. Display $SFGR Object Member List

---

*You must be aware of which command function keys are enabled or disabled by any screen format being displayed. The enabled keys will be able to perform only their SDA function. For example, command function key 7 will return the SDA option menu.

If you have a format named ALL or LIST, you cannot display that format individually; you must display all the formats prior to it before you can see it.

Unpredictable results will occur if either the erase input field attribute or the override field attribute is enabled. For example, FORMAT6 is currently displayed. FORMAT7 uses erase input fields. If you try to display FORMAT7, the input fields on FORMAT6 are blanked, and FORMAT7 does not appear.

The Start Line Number entry indicates on which line of the display screeen the first line of the format is to be displayed. (An error may occur if the start line number is invalid for the format being displayed; for example, if you enter a start line number of 12 and the name of a format that requires 13 lines of the display screen, an error will occur.)

The Indicator Bytes entry refers to the record identifying indicators on the D-specification; they can be set either all on or all off.

Notes:

1. Before displaying a format that does not clear all lines on the screen, use command function key 10 to clear the screen. This will avoid any errors that might be caused by overlapping fields.
2. A format not found error is displayed, as in Figure 4-3, if the member name cannot be found where the program was directed to look. This could be because you specified one of the following:
   - A non-$SFGR load member
   - A load member name not in INLIB (see SDA procedure)
   - A format name not within the load member specified
3. The SDA message member is used for all screen formats containing MIC fields. If screen formats contain MIC fields, the display utility uses the SDA message member to display the MIC fields.
4. While displaying a format, the Print key can have two different functions.
   - If the key is *enabled* on the S-specification, SDA will process the key the same as any other command function or function key.
   - If the key is *not enabled* on the S-specification, WSDM will print the data being displayed.

On the 1920-Character Display:

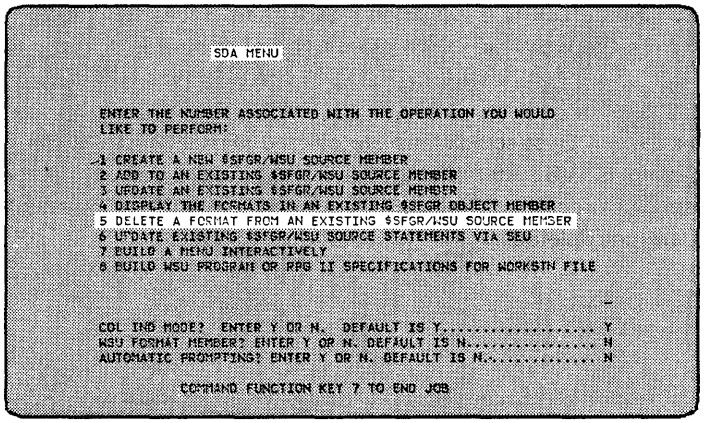
```
**********************************************************************************
**********************************************************************************
**                                                                              **
**                          DISPLAY CALL UP UTILITY                             **
**                          ***********************                             **
**                                                                              **
**                                                                              **
**                                                                              **
**        MEMBER NAME ....  IIIIIIII        FORMAT NAME ....  IIIIIIII         **
**                                                                              **
** START LINE NUMBER..... 01       F INDICATOR BYTES  0-ON  F-OFF               **
**                                                                              **
**  ERROR WHEN TRYING TO FIND MEMBER OR FORMAT NAME SPECIFIED                   **
**                                                                              **
**********************************************************************************
**********************************************************************************
**                                                                              **
**   THE PURPOSE OF THIS PROGRAM IS TO CALL UP THE SPECIFIED FORMATTED           **
**   DISPLAYS FOR VISUAL VERIFICATION. OUTPUT FIELDS NORMALLY SUPPLIED           **
**   BY THE CALLING PROGRAM WILL CONTAIN ASTERISKS. OUTPUT FIELDS               **
**   SUPPLIED BY A MIC WILL CONTAIN ****??                                      **
**                                                                              **
**********************************************************************************
**********************************************************************************
```

On the 960-Character Display:

```
**********************************************************************************
**                          DISPLAY CALL UP UTILITY                             **
**                                                                              **
**        MEMBER NAME ....  IIIIIIII        FORMAT NAME ...   IIIIIIII         **
** START LINE NUMBER..... 01       F INDICATOR BYTES  0-ON  F-OFF               **
**  ERROR WHEN TRYING TO FIND MEMBER OR FORMAT NAME SPECIFIED                   **
**********************************************************************************
**   THE PURPOSE OF THIS PROGRAM IS TO CALL UP THE SPECIFIED FORMATTED           **
**   DISPLAYS FOR VISUAL VERIFICATION. OUTPUT FIELDS NORMALLY SUPPLIED           **
**   BY THE CALLING PROGRAM WILL CONTAIN ASTERISKS. OUTPUT FIELDS               **
**   SUPPLIED BY A MIC WILL CONTAIN ****??                                      **
**********************************************************************************
```

Figure 4-3. Display Call Up Utility Displaying Error Message

Chapter 5. Delete a Format from an Existing $SFGR/WSU Source Member



When you select the option to delete a format from an existing $SFGR/WSU source member, SDA issues the following prompts.

1. ENTER THE NAME OF THE FORMAT TO DELETE OR ALL

   This prompt allows you to enter the name of a format to delete (it is then searched for by SDA) or allows you to delete all or some of the formats. If you enter a format name, the name should be a format that has not already been passed because the delete option makes only one pass through the source statements. If you enter a format name and that format is found, SDA deletes the S- and D-specifications associated with that format and reissues this prompt. If you press the Enter key without keying a format name or if you enter a format name that cannot be found, SDA copies the remaining formats to the work file and issues prompt 3. (The delete option can be selected again if multiple passes through the member are desired.) If you enter ALL, SDA issues prompt 2.

2. DO YOU WANT TO DELETE THIS FORMAT? (Y/N) DEFAULT IS N

   xxxxxxxx (xxxxxxxx is a format name)

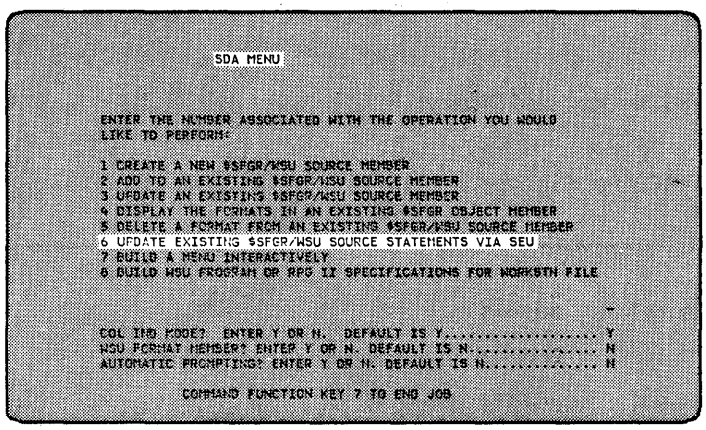
   You can respond with either Y (yes) or N (no). If you respond with Y, SDA deletes the S- and D-specifications associated with that format and prompts you with the next format. If you respond with N, SDA copies the format to the work file and prompts you with the next format. (If anything besides Y is entered, the default N is assumed.) When all the formats have been processed, SDA issues prompt 3.

3. DO YOU WANT THE SOURCE RESEQUENCED? (Y/N) DEFAULT IS N

You can respond with either Y (yes) or N (no). If you respond with Y, SDA renumbers the first 5 positions of the source specifications, beginning with 00010 and incrementing by 10. If you respond with N, SDA does not renumber the source specifications. (If anything besides Y is entered, the default N is assumed.) SDA then places the source member from the work file in the output library and returns to the SDA menu.

Note: Only the S- and D-specifications are deleted. For example, if the member also contains WSU statements, they remain in the source member. Comment S-specifications that precede the S-specification for the format being deleted are not deleted.

Chapter 6. Update Existing $SFGR/WSU Source Statements Via SEU



When you select the option to update existing $SFGR/WSU statements via SEU, you can work directly on the source statements in a member within your output source library (OUTLEN). SDA calls SEU to perform the actual source manipulation. Use this option to insert new statements or to make minor changes to a statement. For example, you may want to use this option to make changes to the S-specification or corrections to a D-specification constant after you have finished your work on a display. You can also use this option to add J-, T-, M-, and C-specifications to a WSU program after you have created the S- and D-specifications by using SDA option 1.

SDA provides the five formats listed below, in addition to the standard SEU formats, which display S- and D-specifications. The SDA formats appear on the SEU Select Display Screen Format Menu. The five formats will have ideographic versions, when SDA is running in the ideographic mode.

Format Name	Use For
SDAS	Prompted S-specification
SDAD1UC	Prompted D-specification, uppercase only
SDAD1LC	Prompted D-specification, lowercase allowed
SDAD2UC	Prompted D-continuation or comment specification, uppercase only
SDAD2LC	Prompted D-continuation or comment specification, lowercase allowed

Notes:

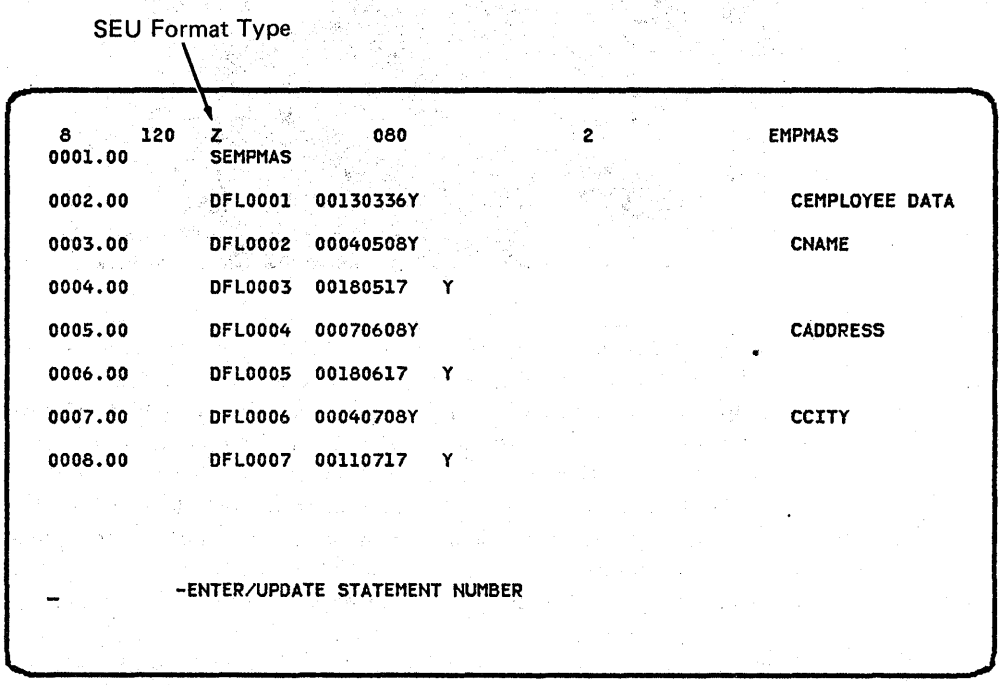
1. SDA option 6 cannot be used to create a new source member.
2. If you want to use the SDA formats with SEU, the format member name is #SE@XTRA.
3. If you use SDA option 6 to add new D-specifications, insert them in ascending row and column sequence; otherwise, future updates with SDA option 3 will not be possible.

The following example shows the displays generated by SDA for SEU.

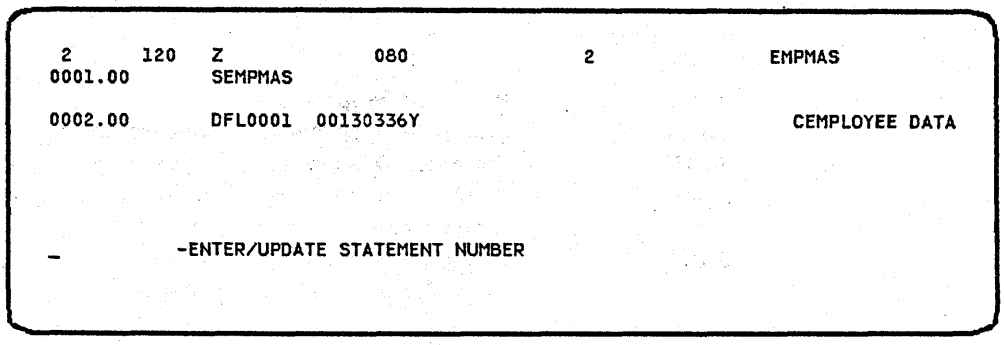
You have just created a display format called EMPMAS. You want to change a statement.

1. Select option 6. The following display appears on the display screen.

On the 1920-Character Display:



On the 960-Character Display:



2. The format type displayed is Z. You want to use an SDA format type. Press command function key 3; a display similar to the following appears.

On the 1920-Character Display:

```
SELECT DISPLAY SCREEN FORMAT MENU

 1  Z           17 WSU-J       33 FORTRAN     49
 2  Z-LOWER     18 WSU-T       34 COBOL       50
 3  H           19 WSU-M       35 SDAS        51
 4  U           20 WSU-S       36 SDAD1UC     52
 5  F           21 WSU-D       37 SDAD1LC     53
 6  G           22 WSU-C       38 SDAD2UC     54
 7  E           23 SFGR-S      39 SDAD2LC     55
 8  L           24 SFGR-D      40 DEFPN       56
 9  T           25 D-CONT      41             57
10  I           26 SORTH       42             58
11  J           27 SORTRC      43             59
12  C           28 SORTRF      44             60
13  O           29 SORTF       45             61
14  P           30 ASSEM       46             62
15  K           31 MICRSYS     47             63
16  A           32 MICRSTCK    48             64

_          -ENTER NUMBER OF DISPLAY SCREEN FORMAT DESIRED
```

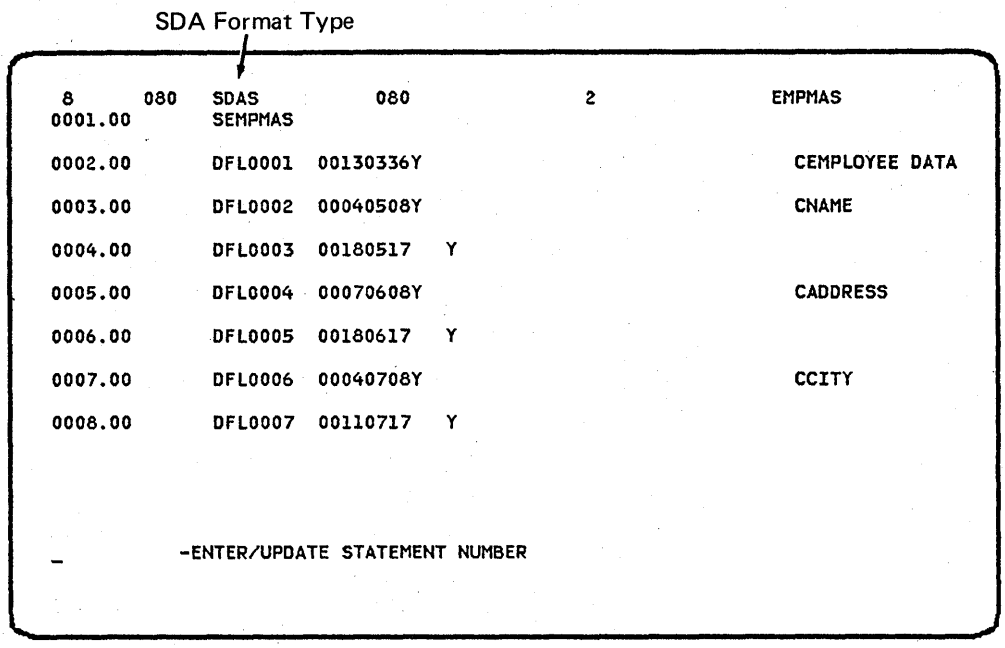
On the 960-Character Display: (Use the Enter/Rec Adv key to scroll between these two screens.)

```
SELECT DISPLAY SCREEN FORMAT MENU
 1  Z           17 WSU-J       33 FORTRAN     49
 2  Z-LOWER     18 WSU-T       34 COBOL       50
 3  H           19 WSU-M       35 SDAS        51
 4  U           20 WSU-S       36 SDAD1UC     52
 5  F           21 WSU-D       37 SDAD1LC     53
 6  G           22 WSU-C       38 SDAD2UC     54
 7  E           23 SFGR-S      39 SDAD2LC     55
 8  L           24 SFGR-D      40 DEFPN       56
_          -ENTER NUMBER OF DISPLAY SCREEN FORMAT DESIRED
```

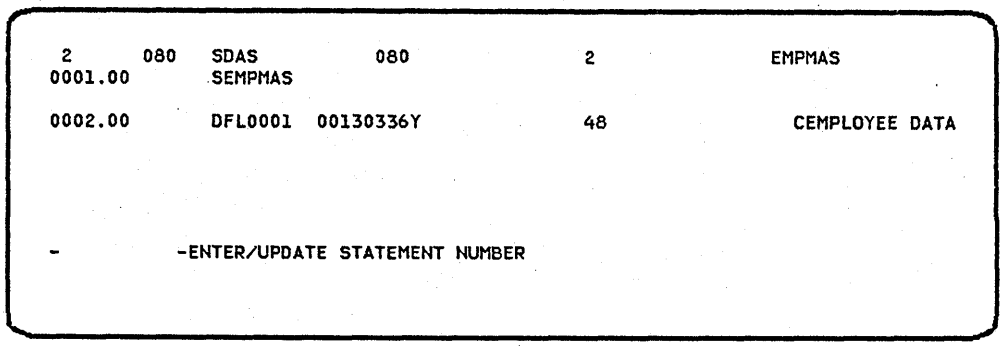
```
SELECT DISPLAY SCREEN FORMAT MENU
 9  T           25 D-CONT      41             57
10  I           26 SORTH       42             58
11  J           27 SORTRC      43             59
12  C           28 SORTRF      44             60
13  O           29 SORTF       45             61
14  P           30 ASSEM       46             62
15  K           31 MICRSYS     47             63
16  A           32 MICRSTCK    48             64
_          -ENTER NUMBER OF DISPLAY SCREEN FORMAT DESIRED
```

3. You want to change the S-specification. Enter the number associated with the SDAS format type. The same display shown in step 1 appears with a format type of SDAS.

On the 1920-Character Display:



On the 960-Character Display:



4. Statement 0001.00 is an S-specification. Enter 1; the following display appears.

On the 1920-Character Display:

```
 8       080 SDAS          080                2      UPDATE   EMPMAS



SEQ #              FORM TYPE         S   FORMAT NAME  EMPMAS    WSU FORMAT ID
START LINE         LINES TO CLEAR        LOWERCASE               RETURN INPUT
RESET KEYBD        SOUND ALARM           BLINK CURSOR            ERASE INPUT
OVERRIDE           SUPPRESS INPUT        WSU START               WSU END
REQUIRED           REPEAT                PRIORITY                PREPROCESS
REVIEW RECORD IDS                  INSERT RECORD IDS
FUNCTION KEYS      COMMAND KEYS        KEY MASK



0001.00     -ENTER/UPDATE STATEMENT NUMBER
```

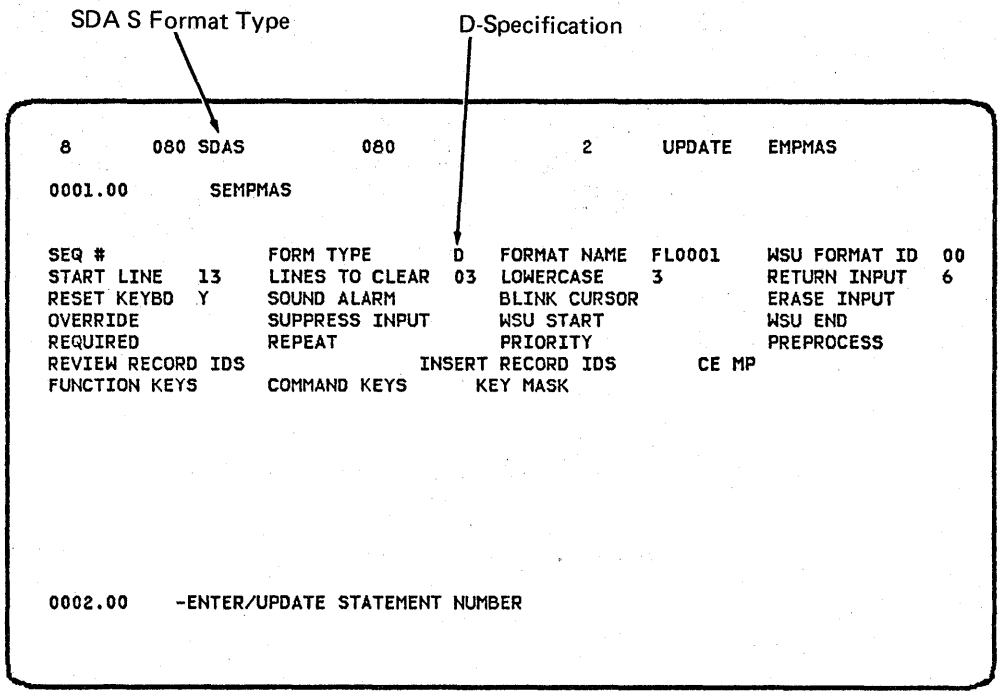
On the 960-Character Display:

```
 2      080   SDAS          080                2      UPDATE   EMPMAS
SEQ #              FORM TYPE         S   FORMAT NAME  EMPMAS    WSU FORMAT ID
START LINE         LINES TO CLEAR        LOWERCASE               RETURN INPUT
RESET KEYBD        SOUND ALARM           BLINK CURSOR            ERASE INPUT
OVERRIDE           SUPPRESS INPUT        WSU START               WSU END
REQUIRED           REPEAT                PRIORITY                PREPROCESS
REVIEW RECORD IDS                  INSERT RECORD IDS
FUNCTION KEYS      COMMAND KEYS        KEY MASK
0001.00     -ENTER/UPDATE STATEMENT NUMBER
```

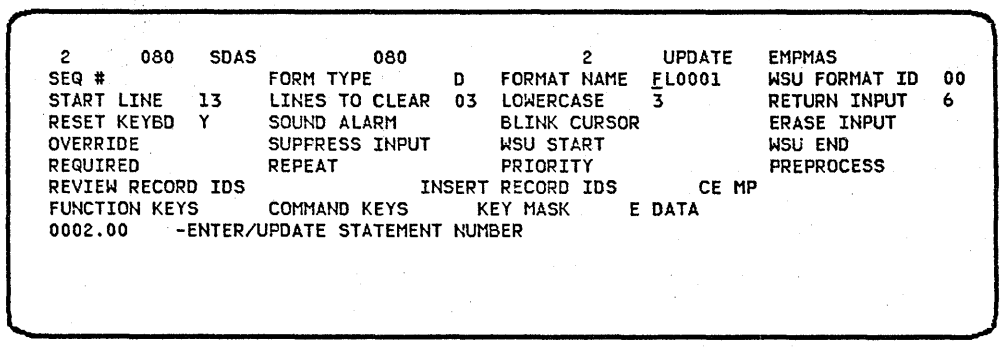
5. Make changes as needed to statement 1. Press the Enter/Rec Adv key.

6. Statement 2 is now displayed. Statement 2 is a D-specification, so you must change the format type to D.

On the 1920-Character Display:

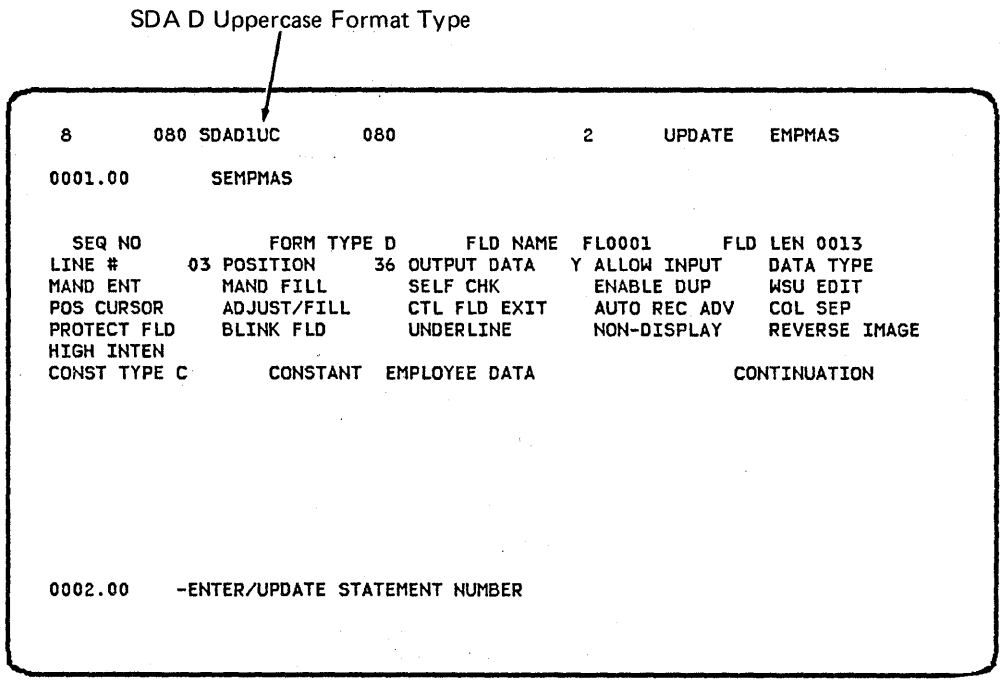


On the 960-Character Display:

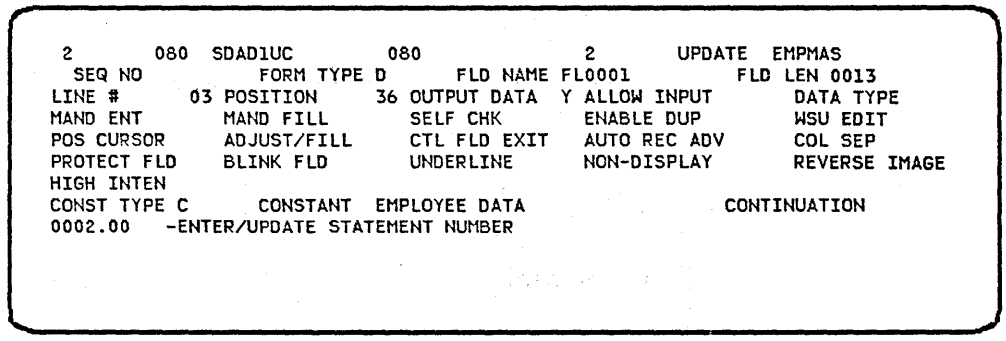


7. Press command function key 3. Entries are uppercase, so select the number associated with the SDAD1UC format type. Press the Enter/Rec Adv key.

On the 1920-Character Display:



On the 960-Character Display:



8. Make changes as needed to statement 2. Press the Enter/Rec Adv key. For this example, statement 18 is a continuation statement that must be updated. Press command function key 3, select the number associated with the SDAD2UC format to change the format type, press the Enter/Rec Adv key, and update statement 18.

On the 1920-Character Display:

SDA D Continuation Uppercase Format Type

```
 8       080 SDAD2UC       080                2      UPDATE   EMPMAS

0017.00       DFL0016  00481408Y                                CNAME OF DEPEND
          ENTS     X

SEQUENCE NUMBER             FORM TYPE    D

7-10--------20--------30--------40--------50--------60--------70-------79
|--|---------|---------|---------|---------|---------|---------|--------|
        AGE OF DEPENDENTS

CONTINUATION









0018.00    -ENTER/UPDATE STATEMENT NUMBER
```

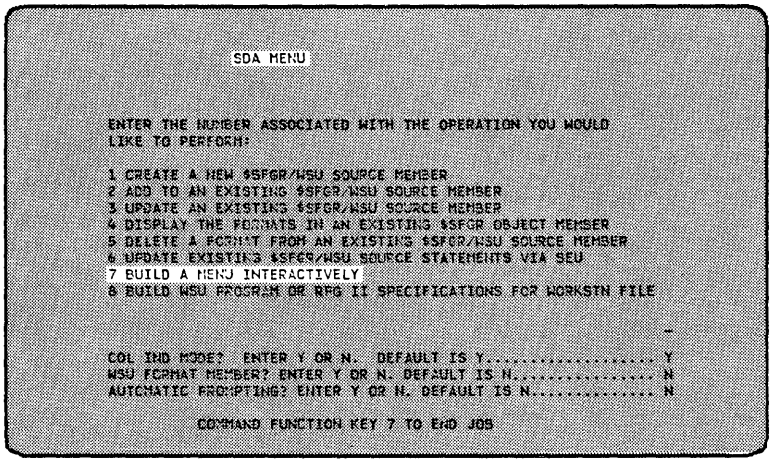
On the 960-Character Display:

```
 2       080   SDAD2UC       080                2      UPDATE   EMPMAS
SEQUENCE NUMBER             FORM TYPE    D

7-10--------20--------30--------40--------50--------60--------70-------79
|--|---------|---------|---------|---------|---------|---------|--------|
        AGE OF DEPENDENTS

CONTINUATION
0002.00    -ENTER/UPDATE STATEMENT NUMBER
```

9. When you are through updating your source statements, press command function key 7. The end of job display will appear. Select the option you want. You will then be returned to the SDA menu.

```
END OF JOB OPTION MENU

0 RETURN TO PROCESSING
1 END OF JOB WITH NO ADDITIONAL OPTIONS
2 END OF JOB WITH A LISTING
3 END OF JOB WITH SERIALIZATION
4 END OF JOB WITH SERIALIZATION AND LISTING
5 END OF JOB--NO REPLACE

              -END OF JOB OPTION
```

Chapter 7. Build a Menu Interactively



When you select the option to build a menu interactively, you can create a new menu or update an existing menu. These menus can be in either fixed-format or free-format. A display (Figure 7-1) shows your choices.

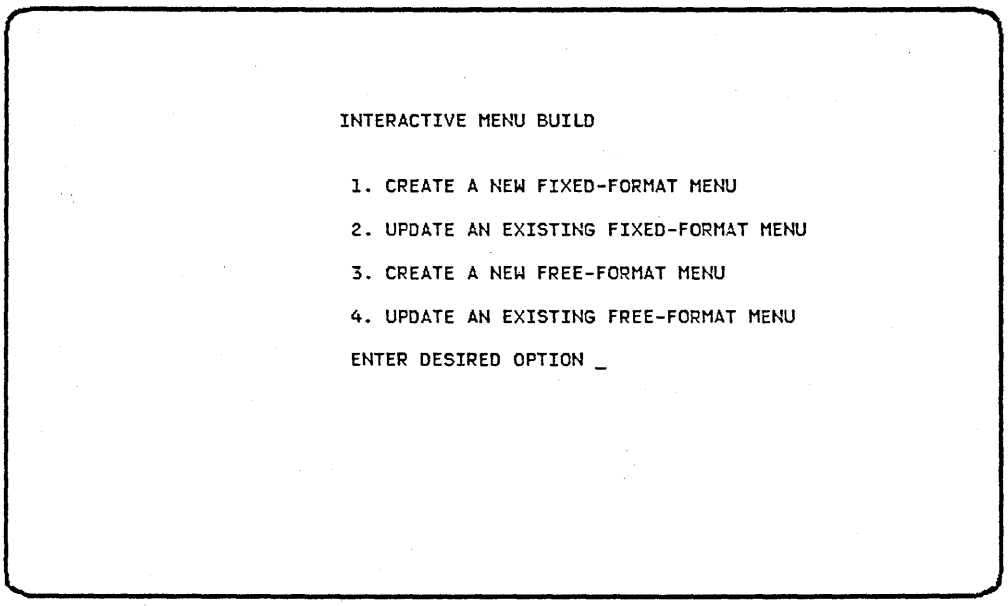
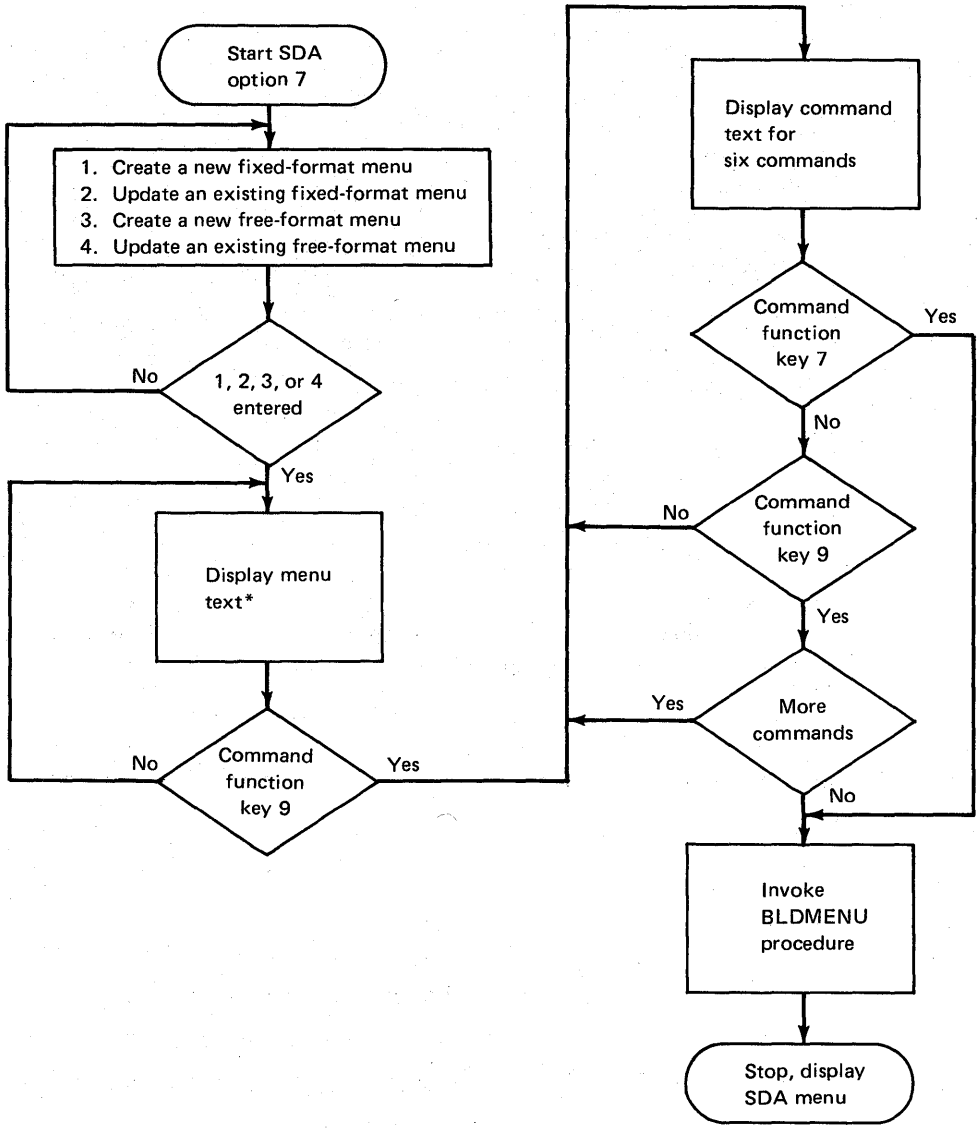


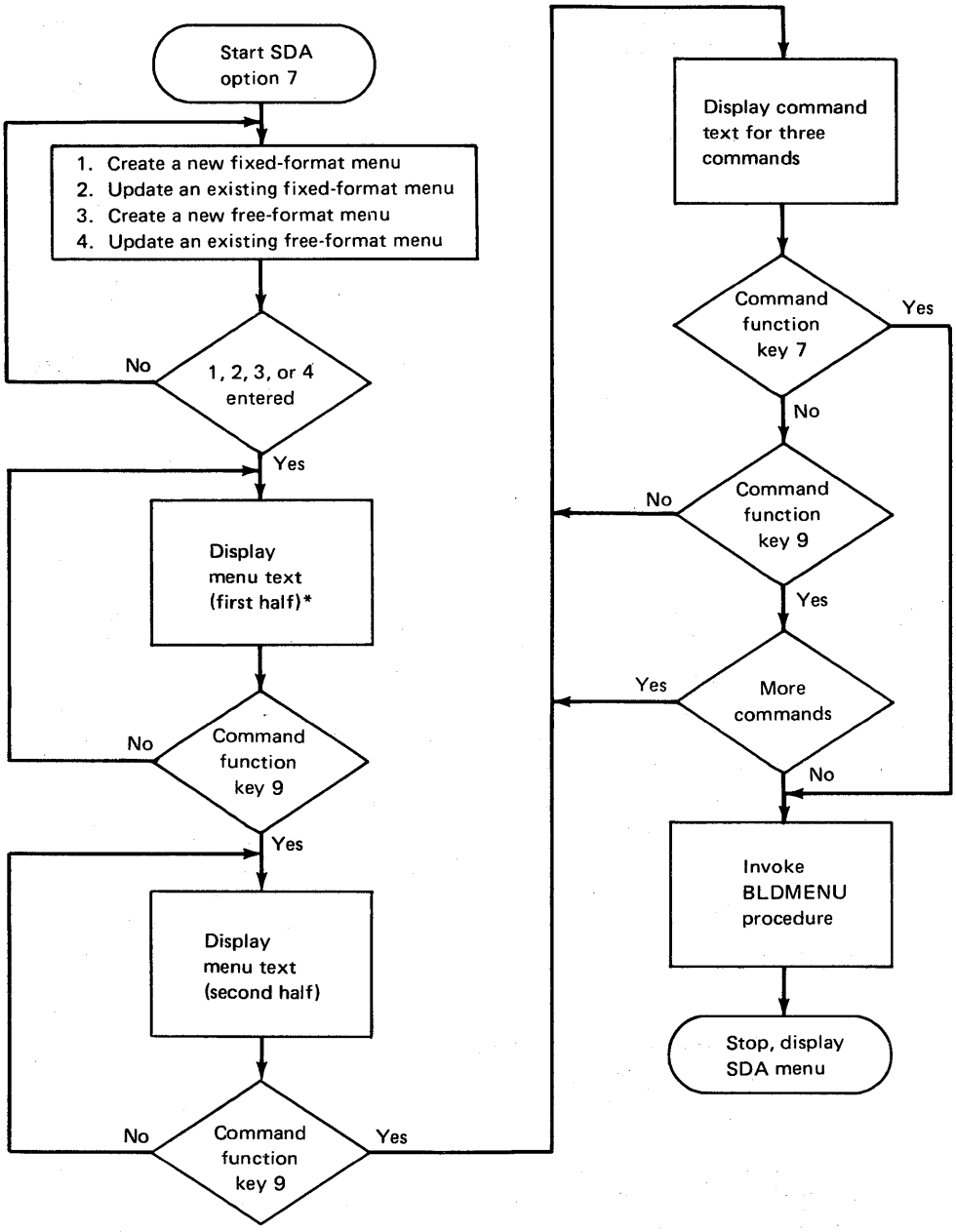
Figure 7-1. Interactive Menu Build Display

Figures 7-2 and 7-3 show the logic flow of the menu build function of SDA.



*Command function key 5 — Allows lowercase characters on the menu text screen.

Figure 7-2. Logic Flow of the Menu Build Function of SDA for the 1920-Character Display Screen



*Command function key 5 — Allows lowercase characters on the menu text screen.

Figure 7-3. Logic Flow of the Menu Build Function of SDA for the 960-Character Display Screen

Select an option and press the Enter/Rec Adv key. If you entered anything other than a number from 1 through 4, the Interactive Menu Build display is reshown. (Command function key 7 returns you to the SDA menu.)

SDA builds two source members for the menu build function:

xxxxxx## for the command source
xxxxxxDT for the display text

xxxxxx is the menu name you entered as parameter 1 (source) of the SDA command statement. The maximum length of a menu name is 6 characters. Remember that parameter 5 of the SDA command statement specifies the library in which the menu will be stored.

CREATE A NEW FIXED-FORMAT MENU

When you select this create option, you are prompted to enter the fixed-format menu text. A menu is displayed with 24 numbered blank text lines. You can enter 30 alphanumeric characters or 14 ideographic characters, or a combination of both, up to a maximum of 30 positions for each menu item. Alphanumeric characters are one position long and ideographic characters take up two positions. Ideographic fields must begin with the shift-out character, followed by data, and end with the shift-in character. The shift-out and shift-in characters each are one position in length. The name of the menu being created is at the top of the display.

When entering alphanumeric or Katakana data, you might choose to create a menu with lowercase characters. Press command function key 5. The menu is redisplayed with any data previously entered, but now lowercase characters are allowed.

If you press command function key 7 on the menu display, SDA displays a message that allows you to return to the SDA menu (1 option) or to continue entering text (0 option).

The fixed-format menu display on the 960-character display requires two displays. The first half of the menu display shows items 1 through 6 and 13 through 18; the second half shows items 7 through 12 and 19 through 24. After you have entered all desired text on the first half of the menu display, press command function key 9 to get the second half of the display.

Figures 7-4 and 7-5 show the creating of a menu labeled PAYROL. Figure 7-4 shows the blank menu, and Figure 7-5 shows the text that has been entered.

On the 1920-Character Display:

```
COMMAND                                                          ID

                              MENU: PAYROL

 1. _                              13.
 2.                                14.
 3.                                15.
 4.                                16.
 5.                                17.
 6.                                18.
 7.                                19.
 8.                                20.
 9.                                21.
10.                                22.
11.                                23.
12.                                24.



ENTER NUMBER, COMMAND, OR OCL
```

On the 960-Character Display:

First Half:

```
COMMAND                                                          ID

                              MENU: PAYROL
 1. _                              13.
 2.                                14.
 3.                                15.
 4.                                16.
 5.                                17.
 6.                                18.

ENTER NUMBER, COMMAND, OR OCL.
```

Second Half:

```
COMMAND                                                          ID

                              MENU: PAYROL
 7. _                              19.
 8.                                20.
 9.                                21.
10.                                22.
11.                                23.
12.                                24.

ENTER NUMBER, COMMAND, OR OCL.
```

Figure 7-4. Blank Fixed-Format PAYROL Menu

On the 1920-Character Display:

```
COMMAND                                                              ID

                              MENU: PAYROL

 1. TIME CARD ENTRY                13.
 2. WEEKLY RUN                     14.
 3. SOCIAL SECURITY REPORT         15.
 4. UNION REPORTING                16.
 5. YEARLY STATE TAXES             17.
 6. EMPLOYEE DEDUCTIONS            18.
 7.                                19.
 8.                                20.
 9.                                21.
10.                                22.
11.                                23.
12.                                24.



ENTER NUMBER, COMMAND, OR OCL
```

On the 960-Character Display:

First Half:

```
COMMAND                                                              ID

                              MENU: PAYROL
 1. TIME CARD ENTRY                13.
 2. WEEKLY RUN                     14.
 3. SOCIAL SECURITY REPORT         15.
 4. UNION REPORTING                16.
 5. YEARLY STATE TAXES             17.
 6. EMPLOYEE DEDUCTIONS            18.

ENTER NUMBER, COMMAND, OR OCL.
```

Second Half:

```
COMMAND                                                              ID

                              MENU: PAYROL
 7.                                19.
 8.                                20.
 9.                                21.
10.                                22.
11.                                23.
12.                                24.

ENTER NUMBER, COMMAND, OR OCL.
```

Figure 7-5. Fixed-Format PAYROL Menu with Entries

After you have entered all desired text (none is required), press command function key 9. SDA shows the Command Prompting display. You can now enter the command (control or procedure) to be executed when that menu item is selected. The menu text (if any) for each item is displayed; six menu items on the 1920-character display or three menu items on the 960-character display are shown on each Command Prompting display.

You must enter at least one command. If you enter a command that has no associated text in the display text source member, that command also becomes the display text.

Continuing the example in Figure 7-5, Figure 7-6 shows the Command Prompting display without command data; Figure 7-7 shows the commands that are to be associated with each of the menu items.

On the 1920-Character Display:

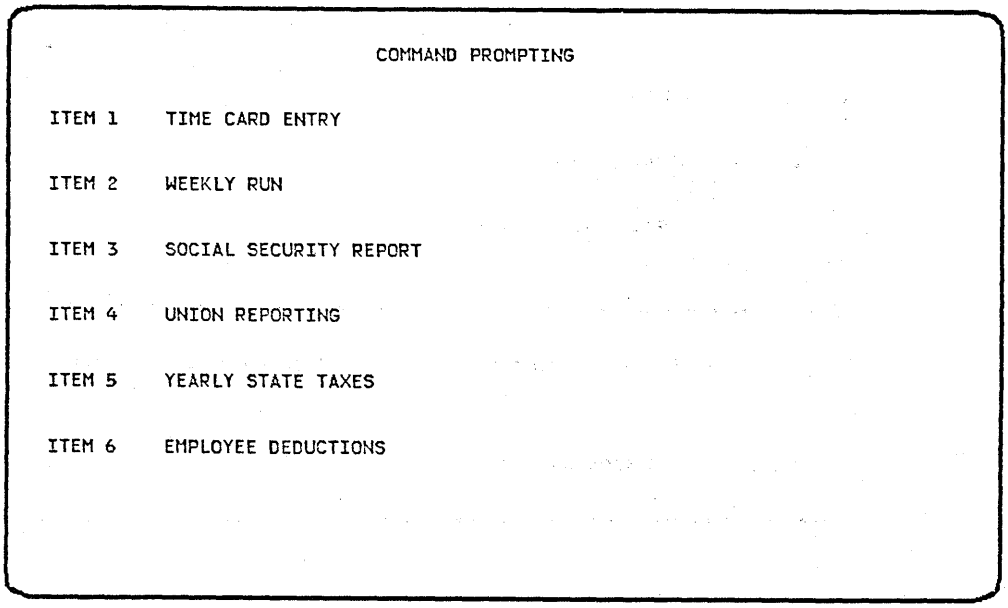


Figure 7-6 (Part 1 of 2). Command Prompting Display-Menu Text Only

On the 960-Character Display:

First Display:

```
                          COMMAND PROMPTING

ITEM 1    TIME CARD ENTRY

ITEM 2    WEEKLY RUN

ITEM 3    SOCIAL SECURITY REPORT
```

Second Display:

```
                          COMMAND PROMPTING

ITEM 4    UNION REPORTING

ITEM 5    YEARLY STATE TAXES

ITEM 6    EMPLOYEE DEDUCTIONS
```

Figure 7-6 (Part 2 of 2). Command Prompting Display-Menu Text Only

On the 1920-Character Display:

```
                          COMMAND PROMPTING

ITEM 1    TIME CARD ENTRY
TIMECARD TOFILE,BATCH#

ITEM 2    WEEKLY RUN
PAYROLL WEEK1,CHECKS,UPDATE

ITEM 3    SOCIAL SECURITY REPORT
FICAREP  ,,ALL

ITEM 4    UNION REPORTING
UNIONREP LOCAL1,LOCAL17

ITEM 5    YEARLY STATE TAXES
STATETAX TOTALYR,ALL

ITEM 6    EMPLOYEE DEDUCTIONS
DEDUCT INPUT,,WEEKLY
```

Figure 7-7 (Part 1 of 2). Menu Text with Associated Procedures

On the 960-Character Display:

First Display:

```
                              COMMAND PROMPTING


ITEM 1    TIME CARD ENTRY
TIMECARD TOFILE,BATCH#

ITEM 2    WEEKLY RUN
PAYROLL WEEK1,CHECKS,UPDATE

ITEM 3    SOCIAL SECURITY REPORT
FICAREP ,,ALL
```

Second Display:

```
                              COMMAND PROMPTING


ITEM 4    UNION REPORTING
UNIONREP LOCAL1,LOCAL17

ITEM 5    YEARLY STATE TAXES
STATETAX TOTALYR,ALL

ITEM 6    EMPLOYEE DEDUCTIONS
DEDUCT INPUT,,WEEKLY
```

Figure 7-7 (Part 2 of 2). Menu Text with Associated Procedures

After you have entered the commands, press either command function key 9 or command function key 7. Command function key 9 causes SDA to show the next Command Prompting display. Command function key 7 causes SDA to bypass the rest of the Command Prompting displays. The data that was entered in the previous displays is processed by the BLDMENU procedure.

For example, if the menu you want to create contains only items 1 through 12, press command function key 7 after completing the command for item 12. SDA then bypasses the rest of the displays and calls the BLDMENU procedure to process the data that was entered up to the point at which command function key 7 was pressed. SDA will provide a build menu listing.

```
          BUILD MENU LISTING FOR  -PAYRUN       MENU IN LIBRARY -DRFLIB          DATE  11/27/79     TIME  11.39

               COMMAND MEMBER USED-PAYRUN##
            DISPLAY TEXT MEMBER USED-PAYRUNDT


       TREATMENT OF ITEM    1

COMMAND     -TIMECARD TOFILE,BATCH#
DISPLAY TEXT INPUT          -TIME CARD ENTRY
DISPLAY TEXT USED           -TIME CARD ENTRY


       TREATMENT OF ITEM    2

COMMAND     -PAYROLL WEEK1,CHECKS,UPDATE
DISPLAY TEXT INPUT          -WEEKLY RUN
DISPLAY TEXT USED           -WEEKLY RUN


       TREATMENT OF ITEM    3

COMMAND     -FICAREP ,,ALL
DISPLAY TEXT INPUT          -SOCIAL SECURITY REPORT
DISPLAY TEXT USED           -SOCIAL SECURITY REPORT


       TREATMENT OF ITEM    4

COMMAND     -UNIONREP LOCAL1,LOCAL17
DISPLAY TEXT INPUT          -UNION REPORTING
DISPLAY TEXT USED           -UNION REPORTING


       TREATMENT OF ITEM    5

COMMAND     -STATETAX TOTALYR,ALL
DISPLAY TEXT INPUT          -YEARLY STATE TAXES
DISPLAY TEXT USED           -YEARLY STATE TAXES


       TREATMENT OF ITEM    6

COMMAND     -DEDUCT INPUT,,WEEKLY
DISPLAY TEXT INPUT          -EMPLOYEE DEDUCTIONS
DISPLAY TEXT USED           -EMPLOYEE DEDUCTIONS
```

Figure 7-8 (Part 1 of 2). Sample Build Menu Listing for a Fixed Format Menu

```
BUILD MENU LISTING FOR  -PAYRUN       MENU IN LIBRARY -DRFLIB            DATE  11/27/79     TIME  11.39

    ********************************************************************************
    *                                                                              *
01  * COMMAND                                    INQUIRY                           *
    *                                                                              *
02  *                                MENU: PAYRUN                                  *
    *                                                                              *
03  *  1. TIME CARD ENTRY                13.                                       *
    *                                                                              *
04  *  2. WEEKLY RUN                     14.                                       *
    *                                                                              *
05  *  3. SOCIAL SECURITY REPORT         15.                                       *
    *                                                                              *
06  *  4. UNION REPORTING                16.                                       *
    *                                                                              *
07  *  5. YEARLY STATE TAXES             17.                                       *
    *                                                                              *
08  *  6. EMPLOYEE DEDUCTIONS            18.                                       *
    *                                                                              *
09  *  7.                                19.                                       *
    *                                                                              *
10  *  8.                                20.                                       *
    *                                                                              *
11  *  9.                                21.                                       *
    *                                                                              *
12  * 10.                                22.                                       *
    *                                                                              *
13  * 11.                                23.                                       *
    *                                                                              *
14  * 12.                                24.                                       *
    *                                                                              *
15  *                                                                              *
    *                                                                              *
16  *                                                                              *
    *                                                                              *
17  *                                                                              *
    *                                                                              *
18  *                                                                              *
    *                                                                              *
19  *                                                                              *
    *                                                                              *
20  *                                                                              *
    *                                                                              *
21  * ENTER NUMBER, COMMAND, OR OCL.          OR PRESS CMD KEY 1 TO RESUME JOB.    *
    *                                                                              *
22  *                                                                              *
    *                                                                              *
23  *                                                          <- READY            *
    *                                                                              *
24  *                                                                              *
    *                                                                              *
    ********************************************************************************
```

Figure 7-8 (Part 2 of 2). Sample Build Menu Listing for a Fixed Format Menu

If you enter no commands before pressing command function key 7, SDA displays a message that allows you to return to the SDA menu (1 option) or to resume entering commands (0 option).

UPDATE AN EXISTING FIXED-FORMAT MENU

This update option allows you to update the fixed-format display text or command source for each item of the fixed-format menu. SDA first checks the source members for valid information. If a source member contains records that do not pertain to menus, a warning message is issued because SDA replaces the old source member with a new one and the old data is lost.

SDA then displays the existing fixed-format menu:

- If there is no display text source member, SDA displays a message that notifies you of this and allows you to continue or cancel the job. If you cancel (3-option), the command source member is not affected. If you continue (0-option), SDA displays the menu, using the first 30 characters of the corresponding command source as the text of each menu item.

- If there is a display text source member, SDA compares each item in the display text source member against each item in the command source member. If there is a command but no display text for an item, SDA uses the first 30 characters of the command as the display text for the item.

  Once the existing menu is displayed, you can add, update, or delete any item.

  Notes:
  1. If you press command function key 5, you can enter lowercase data into the menu.
  2. You can delete the display text source member by blanking out the text for every item on the display (use the Erase Input key).
  3. The fixed-format menu update option should not be used to update a free-format menu; shifting and truncation of the display source text may result.

After completing the updates to the menu, you can press command function key 7 or 9. Command function key 7 causes SDA to bypass any updating of the command source and to go directly to building a new menu. Command function key 9 causes SDA to display the commands six items at a time on the 1920-character display or three items at a time on the 960-character display. You can add, update, or delete any item and proceed to the next display. When you are finished with the current display or if you want to skip it, press command function key 9. When you are finished with the last display or want to skip all remaining displays, press command function key 7.

If you blank out the command source member, a message prompts you to either terminate the job or reenter menu commands. If you terminate the job by taking the 1 option, the source members are not updated, and the SDA menu is displayed.

CREATE A NEW FREE-FORMAT MENU

When you select this create option, you are prompted to enter the free-format menu text. A blank menu is displayed with 18 blank text lines on the 1920-character display and 6 blank text lines on the 960-character display. You can enter 75 alphanumeric characters, or 36 ideographic characters, or a combination of both, up to a maximum of 75 positions for each menu item. Alphanumeric characters are one position in length, and ideographic characters are two positions long. Ideographic fields must begin with the shift-out character, followed by data, and end with the shift-in character. The shift-out and shift-in characters each take one position. The name of the menu being created is at the top of the display. Asterisks (*) show the boundaries for each line.

If you choose to create a menu with lowercase letters, press command function key 5. The menu is redisplayed with any data previously entered, but now lowercase letters are allowed.

If you press command function key 7 on the menu display, SDA displays a message that allows you to return to the SDA menu (1 option) or to continue entering text (0 option).

The free-format menu display on the 960-character display requires two displays. The first half of the menu display shows text that can use up to 6 lines; the second half shows more text that can use up to 6 lines. After you have entered all desired text on the first half of the menu display, press command function key 9 to get the second half of the display. The first half of the menu display corresponds to lines 3 through 8 on a 1920-character display; the second half of the menu display corresponds to lines 9 through 14 on a 1920-character display.

Figures 7-9 and 7-10 show the creating of a menu labeled PAYROL. Figure 7-9 shows the blank menu, and Figure 7-10 shows the text that has been entered. Text must be entered on the blank menu display.

On the 1920-Character Display:

```
 COMMAND                                                          ID
*                          MENU: PAYROL                           *
_




*                                                                 *
ENTER NUMBER, COMMAND, OR OCL.
```

On the 960-Character Display:

First Half:

```
 COMMAND   1ST HALF                                               ID
*                          MENU: PAYROL                           *
_




*                                                                 *
ENTER NUMBER, COMMAND, OR OCL.
```

Second Half:

```
 COMMAND   2ND HALF                                               ID
*                          MENU: PAYROLL                          *
_




*                                                                 *
ENTER NUMBER, COMMAND, OR OCL.
```

Figure 7-9. Blank Free-Format PAYROL Menu

On the 1920-Character Display:

```
 COMMAND                                                          ID
*                              MENU:  PAYROL                      *


                          1.  TIME CARD ENTRY
                          2.  WEEKLY RUN
                          3.  SOCIAL SECURITY REPORT
                          4.  UNION REPORTING
                          5.  YEARLY STATE TAXES
                          6.  EMPLOYEE DEDUCTIONS









*                                                                  *
ENTER NUMBER, COMMAND, OR OCL.
```

On the 960-Character Display:

First Half:

```
 COMMAND   1ST HALF                                               ID
*                              MENU:  PAYROL                      *

                          1. TIME CARD ENTRY
                          2. WEEKLY RUN
                          3. SOCIAL SECURITY REPORT
                          4. UNION REPORTING
                          5. YEARLY STATE TAXES
                          6. EMPLOYEE DEDUCTIONS
*                                                                  *
ENTER NUMBER, COMMAND, OR OCL.
```

Second Half:

```
 COMMAND   2ND HALF                                               ID
*                              MENU:  PAYROL                      *









*                                                                  *
ENTER NUMBER, COMMAND, OR OCL.
```

Figure 7-10. Free-Format PAYROL Menu with Entries

After you have entered all desired text (some text is required), press command function key 9. SDA shows the Command Prompting display. You can now enter the command (control or procedure) to be executed when that menu item is selected. No menu text is displayed; six menu items on the 1920-character display or three menu items on the 960-character display are shown on each Command Prompting display.

You must enter at least one command. You can enter commands that have no associated display text. The commands do not become the display text, as in the case of fixed-format menus. This may be useful, for example, if menu item 24 is always sign-off and you do not want to put that information on all menus.

Continuing the example in Figure 7-10, Figure 7-11 shows the Command Prompting display without command data; Figure 7-12 shows the commands that are to be associated with each of the menu items.

On the 1920-Character Display:

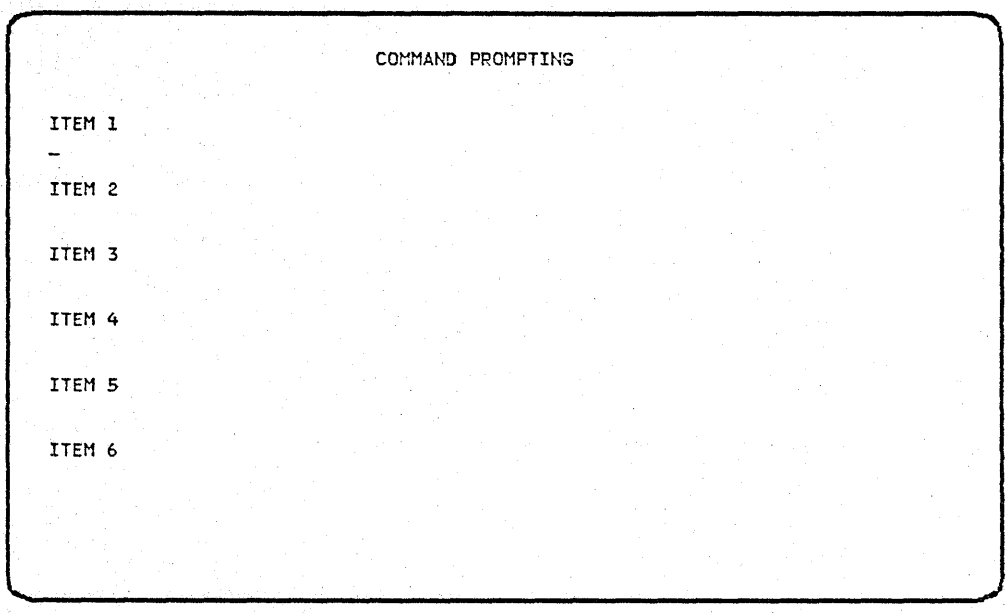


Figure 7-11 (Part 1 of 2). Command Prompting Display Before Command Data Is Entered

On the 960-Character Display:

First Display:

```
                              COMMAND PROMPTING

ITEM 1
-
ITEM 2

ITEM 3
```

Second Display:

```
                              COMMAND PROMPTING

ITEM 4
-
ITEM 5

ITEM 6
```

Figure 7-11 (Part 2 of 2). Command Prompting Display Before Command Data Is Entered

On the 1920-Character Display:

```
                              COMMAND PROMPTING

ITEM 1
TIMECARD TOFILE,BATCH#

ITEM 2
PAYROLL WEEK1,CHECKS,UPDATE

ITEM 3
FICAREP ,,ALL

ITEM 4
UNIONREP LOCAL1,LOCAL17

ITEM 5
STATETAX TOTALYR,ALL

ITEM 6
DEDUCT INPUT,,WEEKLY
```

Figure 7-12 (Part 1 of 2). Command Prompting Display with Commands

On the 960-Character Display:

First Display:

```
                          COMMAND PROMPTING

ITEM 1
TIMECARD TOFILE,BATCH#

ITEM 2
PAYROLL WEEK1,CHECKS,UPDATE

ITEM 3
FICAREP ,,ALL
```

Second Display:

```
                          COMMAND PROMPTING

ITEM 4
UNIONREP LOCAL1,LOCAL17

ITEM 5
STATETAX TOTALYR,ALL

ITEM 6
DEDUCT INPUT,,WEEKLY
```

Figure 7-12 (Part 2 of 2). Command Prompting Display with Commands

After you have entered the commands, press either command function key 9 or command function key 7. Command function key 9 causes SDA to show the next Command Prompting display. Command function key 7 causes SDA to bypass the rest of the Command Prompting displays. The data that was entered in the previous displays is processed by the BLDMENU procedure. SDA will provide a build menu listing.

For example, if the menu you want to create contains only items 1 through 12, press command function key 7 after completing the command for item 12. SDA then bypasses the rest of the displays and calls the BLDMENU procedure to process the data that was entered up to the point at which command function key 7 was pressed.

If you enter no commands before pressing command function key 7, SDA displays a message that allows you to return to the SDA menu (1 option) or to return to the first command prompting screen (0 option).

UPDATE AN EXISTING FREE-FORMAT MENU

This update option allows you to update the display text or command source for each item of the free-format menu. SDA first checks the source members for valid information. If a source member contains records that do not pertain to menus, a warning message is issued because SDA replaces the old source member with a new one and the old data is lost.

SDA then displays the existing free-format menu. If there is no display text source member, SDA displays a message that notifies you of this and cancels the job.

Once the existing menu is displayed, you can add, update, or delete any item.

Notes:

1. If you press command function key 5, you can enter lowercase data into the menu.
2. The free-format menu update option should not be used to update a fixed-format menu; shifting and truncation of the display source text may result.

After completing the updates to the menu, you can press command function key 7 or 9. Command function key 7 causes SDA to bypass any updating of the command source and to go directly to building a new menu. Command function key 9 causes SDA to display the commands six items at a time on the 1920-character display or three items at a time on the 960-character display. You can add, update, or delete any item and proceed to the next display. When you are finished with the current display or if you want to skip it, press command function key 9. When you are finished with the last display or want to skip all remaining displays, press command function key 7. SDA will provide a build menu listing.

If you blank out the display text source member, a message prompts you to either terminate the job or reenter the display text.

If you blank out the command source member, a message prompts you to either terminate the job or reenter menu commands. If you terminate the job by taking the 1 option, the source members are not updated, and the SDA menu is displayed.

```
        BUILD MENU LISTING FOR  -BATCH2       MENU IN LIBRARY -DRFLIB          DATE  10/30/79    TIME  08.37

            COMMAND MEMBER USED-BATCH2$$
          DISPLAY TEXT MEMBER USED-BATCH2DT

      TREATMENT OF ITEM    1
COMMAND     -TIMECARD TOFILE,BATCH$

      TREATMENT OF ITEM    2
COMMAND     -PAYROLL WEEK1,CHECKS,UPDATE

      TREATMENT OF ITEM    3
COMMAND     -FICAREP ,,ALL

      TREATMENT OF ITEM    4
COMMAND     -UNIONREP LOCAL1,LOCAL17

      TREATMENT OF ITEM    5
COMMAND     -STATETAX TOTALYR,ALL

      TREATMENT OF ITEM    6
COMMAND     -DEDUCT INPUT,,WEEKLY
```

Figure 7-13 (Part 1 of 3). Build Menu Listing for Free-Format Menu

```
        BUILD MENU LISTING FOR  -BATCH2       MENU IN LIBRARY -DRFLIB          DATE  10/30/79    TIME  08.37

      TREATMENT OF LINE    4
DISPLAY TEXT INPUT         -                          1. TIME CARD ENTRY

      TREATMENT OF LINE    5
DISPLAY TEXT INPUT         -                          2. WEEKLY RUN

      TREATMENT OF LINE    6
DISPLAY TEXT INPUT         -                          3. SOCIAL SECURITY REPORT

      TREATMENT OF LINE    7
DISPLAY TEXT INPUT         -                          4. UNION REPORTING

      TREATMENT OF LINE    8
DISPLAY TEXT INPUT         -                          5. YEARLY STATE TAXES

      TREATMENT OF LINE    9
DISPLAY TEXT INPUT         -                          6. EMPLOYEE DEDUCTIONS
```

Figure 7-13 (Part 2 of 3). Build Menu Listing for Free-Format Menu

```
BUILD MENU LISTING FOR  -BATCH2       MENU IN LIBRARY -DRFLIB            DATE  10/30/79     TIME  08.37

    ********************************************************************************
    *                                                                              *
01  * COMMAND                                    INQUIRY                           *
    *                                                                              *
02  *                                MENU: BATCH2                                  *
    *                                                                              *
03  *                                                                              *
    *                                                                              *
04  *                                1. TIME CARD ENTRY                            *
    *                                                                              *
05  *                                2. WEEKLY RUN                                 *
    *                                                                              *
06  *                                3. SOCIAL SECURITY REPORT                     *
    *                                                                              *
07  *                                4. UNION REPORTING                            *
    *                                                                              *
08  *                                5. YEARLY STATE TAXES                         *
    *                                                                              *
09  *                                6. EMPLOYEE DEDUCTIONS                        *
    *                                                                              *
10  *                                                                              *
    *                                                                              *
11  *                                                                              *
    *                                                                              *
12  *                                                                              *
    *                                                                              *
13  *                                                                              *
    *                                                                              *
14  *                                                                              *
    *                                                                              *
15  *                                                                              *
    *                                                                              *
16  *                                                                              *
    *                                                                              *
17  *                                                                              *
    *                                                                              *
18  *                                                                              *
    *                                                                              *
19  *                                                                              *
    *                                                                              *
20  *                                                                              *
    *                                                                              *
21  * ENTER NUMBER, COMMAND, OR OCL.          OR PRESS CMD KEY 1 TO RESUME JOB.    *
    *                                                                              *
22  *                                                                              *
    *                                                                              *
23  *                                                          <- READY            *
    *                                                                              *
24  *                                                                              *
    *                                                                              *
    ********************************************************************************
```

Figure 7-13 (Part 3 of 3). Build Menu Listing for Free-Format Menu

Command Function Key 5: Use this key to create or update the menu with lowercase characters. (The Command Prompting displays are in uppercase only.)

Command Function Key 7: Use this key to bypass the normal sequence in the menu build option.

Fixed-Format Menus

If no commands are entered when you are creating a menu or if all commands are blanked out when you are updating a menu, the following message will appear:

```
SDA-0050 OPTIONS (01 )
MENU CANNOT BE BUILT DUE TO INSUFFICIENT DATA
```

Take the zero option (0) if you wish to continue entering text or commands.

Take the one option (1) if you wish to terminate the job. If you terminate the job and there are no commands, no members are built or updated.

If at least one command exists in the command source, SDA builds the source member and executes the BLDMENU procedure. For example, if you are only updating the menu display, make the change and press command function key 7. SDA bypasses the Command Prompting displays and calls the BLDMENU procedure. If you are using the menu create option and only want to enter the first six commands, make the entries and press command function key 7. SDA bypasses the rest of the Command Prompting displays and calls the BLDMENU procedure.

Free-Format Menus

If no display text is entered when you are creating a menu, or if all text is blanked out when you are updating a menu, the following message will appear:

```
SDA-0050 OPTIONS (01 )
MENU CANNOT BE BUILT DUE TO INSUFFICIENT DATA
```

Take the zero option (0) if you wish to continue entering text.

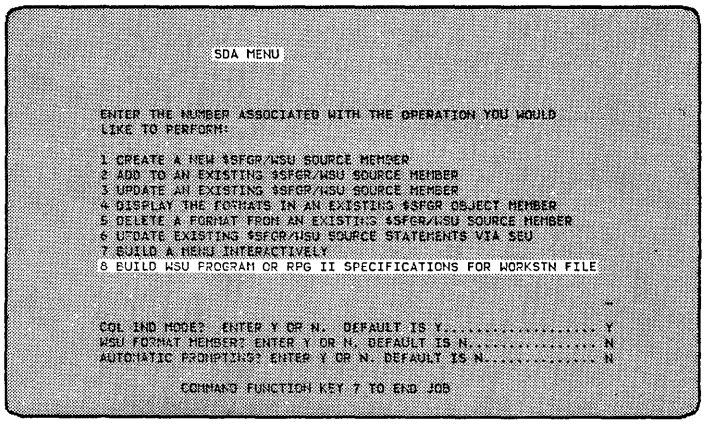
Take the one option (1) if you wish to terminate the job. If you terminate the job and there are no commands or text, no members are built or updated.

If no commands are entered in the create mode or if all commands are blanked out in the update mode, a message prompts you to either terminate the job or continue entering text or commands. If you terminate the job and there are no commands, no members are built or updated.

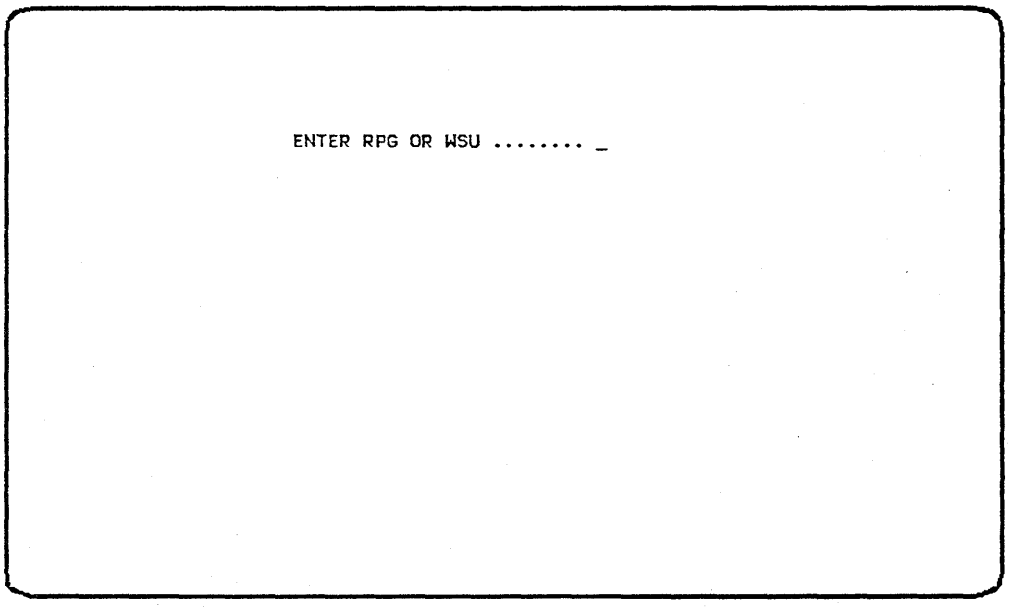
If at least one command exists in the command source and there is menu text, SDA builds the source members and executes the BLDMENU procedure. For example, if you are only updating the menu display, make the change and press command function key 7. SDA bypasses the Command Prompting displays and calls the BLDMENU procedure. If you are using the menu create option and want to enter the first six commands, make the entries and press command function key 7. SDA bypasses the rest of the Command Prompting displays and calls the BLDMENU procedure.

Command Function Key 9: Use this key to go from one display to the next. On the 1920-character display, the order is as follows: the menu display, commands 1 through 6, commands 7 through 12, commands 13 through 18, and commands 19 through 24. On the 960-character display the order is as follows: first half of the menu display, second half of the menu display, commands 1 through 3, commands 4 through 6, commands 7 through 9, commands 10 through 12, commands 13 through 15, commands 16 through 18, commands 19 through 21, and commands 22 through 24.

Chapter 8. Build WSU Program or RPG II Specifications for WORKSTN File



After you have selected the option to build a WSU program or RPG II specifications for a WORKSTN file, the following screen is displayed:



Entering WSU allows you to build a WSU source program. Entering RPG allows you to build a skeleton RPG program.

CAUTION
SDA will replace whatever is in the module if it has the same name as your RPG skeleton program. You should use a 'work' name for the RPG skeleton program you are building so you do not delete anything from the module.

RPG

As an RPG programmer, you will need to generate file description, input, and output specifications that agree with the corresponding input and output fields in the formats to be displayed by the RPG program. To aid you in this process, SDA can build a skeleton RPG program that corresponds to the specified $SFGR source member. Appendix B shows how you can use SDA to create an RPG program.

The skeleton program contains the following:

1. An H-specification with the number of display formats and program name fields filled in

2. An F-specification for a WORKSTN file (Continuation lines are provided if they are required.)

3. The I-specifications for any input fields

4. The O-specifications for any execution time output fields

When a numeric input field is found, you will be prompted for the number of decimal positions in that field. If you do not enter a number, the default is zero decimal positions.

The following example shows how you can use SDA to create a skeleton RPG program for a WORKSTN file.

You have created a format called TIMECD, using SDA option 1. Figure 8-1 shows the display format. Figure 8-2 shows the specifications created by SDA. Figure 8-3 shows the printed output from $SFGR.

```
                                TIME CARD ENTRY

EMPLOYEE NUMBER 123456          EMPLOYEE NAME  STEPHEN A DAHL

REGULAR HOURS.... 0404

REGULAR RATE..... 1111

OVERTIME HOURS... 0080

OVERTIME RATE.... 1544
```

Figure 8-1. Display Format of TIMECD

```
STIMECD
DFL0001   00150335Y                    CTIME CARD ENTRY
DFL0002   00150504Y                    CEMPLOYEE NUMBER
DEMPNUM   00060520Y
DFL0004   00140535Y                    CEMPLOYEE NAME
DEMPNAM   00140550Y
DFL0006   00170704Y                    CREGULAR HOURS....
DREGHRS   00040722   YN   Z
DFL0008   00170904Y                    CREGULAR RATE.....
DREGRTE   00040922   YN   Z
DFL0010   00171104Y                    COVERTIME HOURS...
DOVRHRS   00041122   YN   Z
DFL0012   00171304Y                    COVERTIME RATE....
DOVRRTE   00041322   YN   Z
```

Figure 8-2. Specifications Created by SDA

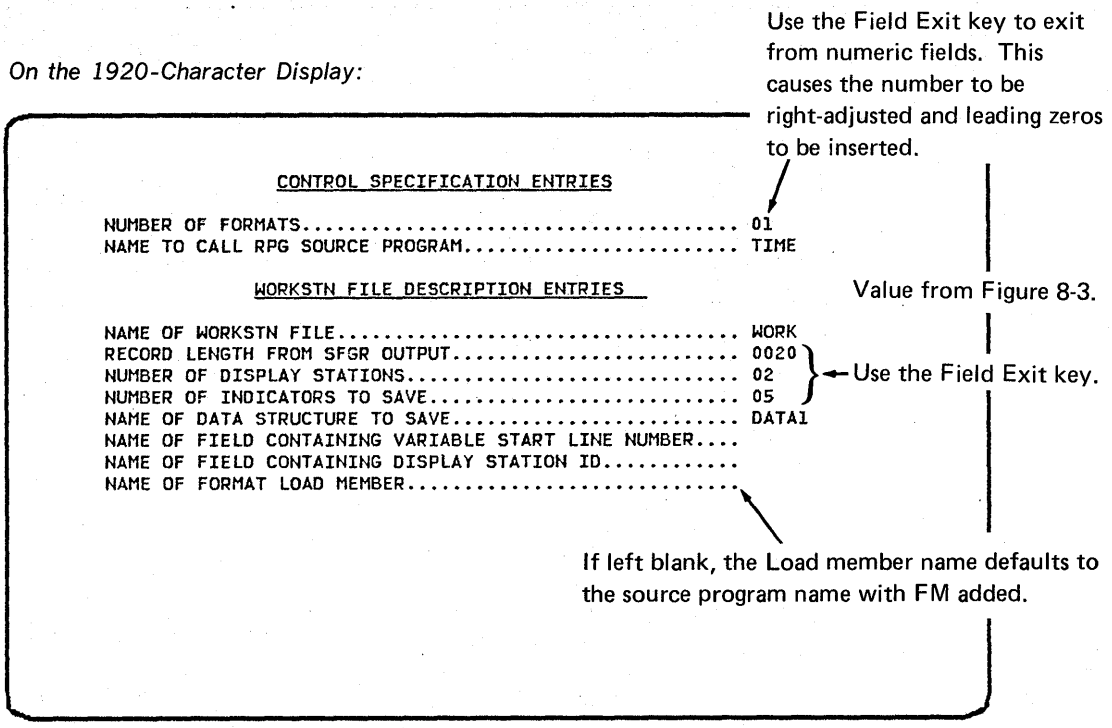
```
SOURCE INPUT SCREEN FORMAT SOURCE SPECIFICATIONS

   STIMECD
   DFL0001  00150335Y                    CTIME CARD ENTRY
   DFL0002  00150504Y                    CEMPLOYEE NUMBER
   DEMPNUM  00060520Y
   DFL0004  00140535Y                    CEMPLOYEE NAME
   DEMPNAM  00140550Y
   DFL0006  00170704Y                    CREGULAR HOURS....
   DREGHRS  00040722   YN   Z
   DFL0008  00170904Y                    CREGULAR RATE.....
   DREGRTE  00040922   YN   Z
   DFL0010  00171104Y                    COVERTIME HOURS...
   DOVRHRS  00041122   YN   Z
   DFL0012  00171304Y                    COVERTIME RATE....
   DOVRRTE  00041322   YN   Z

EXECUTION TIME OUTPUT BUFFER DESCRIPTION

FIELD                          START        END
NAME            LENGTH         POSITION     POSITION

EMPNUM             6              1            6
EMPNAM            14              7           20

INPUT BUFFER DESCRIPTION

FIELD                          START        END
NAME            LENGTH         POSITION     POSITION

REGHRS             4              1            4
REGRTE             4              5            8
OVRHRS             4              9           12
OVRRTE             4             13           16
```

Record length position for Figure 8-4. Use the greater of the two.

Figure 8-3. Printed Output Generated by $SFGR

If you select option 8 on the SDA menu and enter RPG on the next display, the display shown in Figure 8-4 will appear. This example shows the entries already made.

On the 1920-Character Display:



On the 960-Character Display:

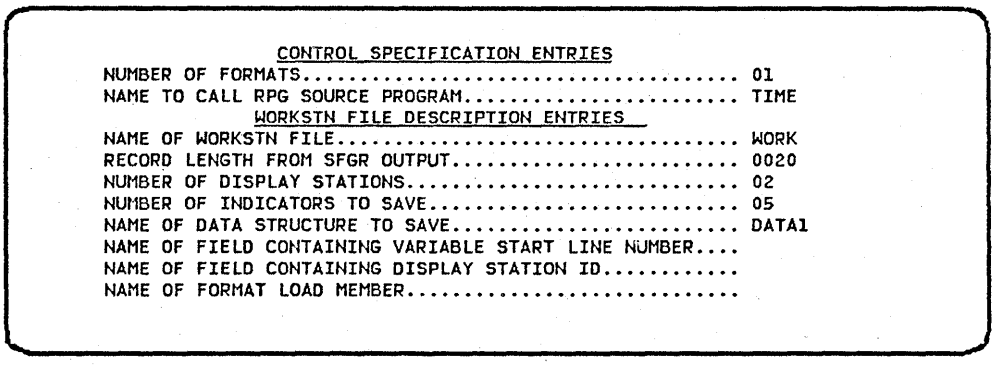


Figure 8-4. Control and WORKSTN File Description Entries

Press the Enter/Rec Adv key after making the last entry. If no input fields are defined, your input is complete.

When input fields have been defined, the Input Field Specification Entries display (Figure 8-5) will appear.

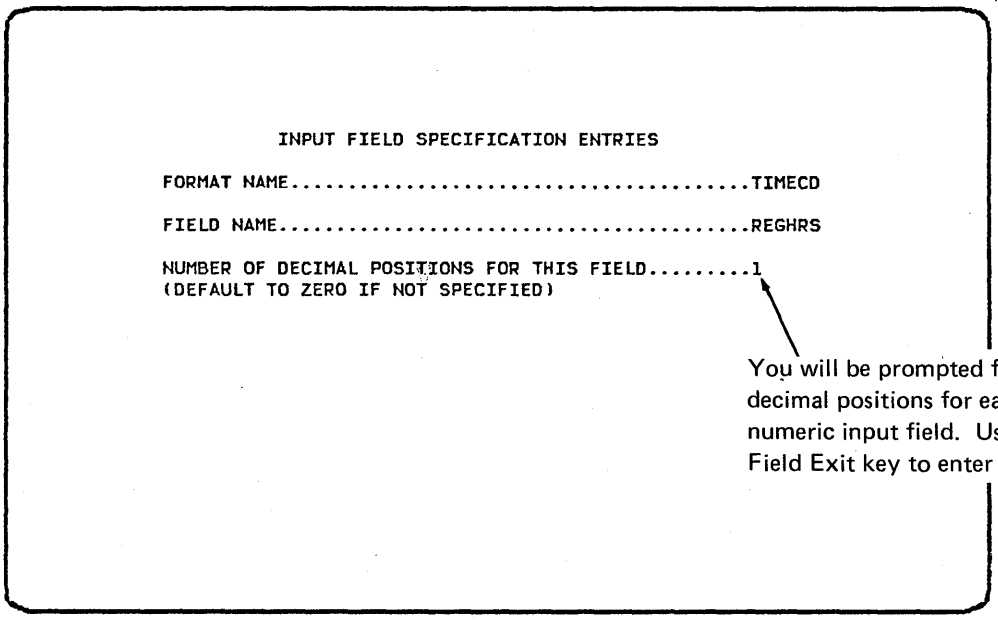


Figure 8-5. Input Field Specification Entries

The RPG specifications will be copied from a work file back to the source library when all specifications have been generated. Figure 8-6 shows the specifications generated by SDA. You can now use SEU or SDA option 6 to complete your program.

```
H                                                 01                    TIME
FWORK    CP   F     0020              WORKSTN
F                                                  KNUM       02
F                                                  KSAVDS DATA1
F                                                  KIND       05
F                                                  K
IWORK
I* FORMAT- TIMECD
I                                          000100041REGHRS
I                                          000500082REGRTE
I                                          000900121OVRHRS
I                                          001300162OVRRTE
OWORK
O                                        K8 'TIMECD
O                                EMPNUM  0006
O                                EMPNAM  0020
```

Figure 8-6. RPG Skeleton WORKSTN Program

WSU

SDA allows you to build some portions of a work station utility (WSU) program.

A WSU source program consists of a J- (job) specification, a T- (transaction file) specification, an M- (master file) specification, S- (display screen) specifications, D- (display data) specifications, C- (calculation) specifications, I- (input) specifications, and F- (file) specifications.

You can use SDA option 1 to build the S- and D-specifications. You must use SEU to build the F- and I-specifications for the transaction file and the master file. You can then use option 8 of SDA to build the J-, T-, M-, and C-specifications.

Building a WSU Program

For example, you have a display format called TIMECDA, shown in Figure 8-7. Figure 8-8 shows the S- and D-specifications created using SDA option 1. Figures 8-9 and 8-10 show the F- and I-specifications created, using SEU, for a transaction file named TRANSFL and a master file named MASTERFL. The F- and I-specifications are needed for compiling the WSU source program.

```
                                TIME CARD ENTRY

EMPLOYEE NUMBER 000000          EMPLOYEE NAME XXXXXXXXXXXXXXXXXX

REGULAR HOURS.... 0000

REGULAR RATE..... 0000

OVERTIME HOURS... 0000

OVERTIME RATE.... 0000
```

Figure 8-7. Display Format

```
STIMECDA
D            0335Y                                  P'TIME CARD ENTRY'
D            0504Y                                  P'EMPLOYEE NUMBER'
DEMPNUM  00060520Y  YN    Z
D            0535Y                                  P'EMPLOYEE NAME'
DEMPNAM  00160549Y  Y
D            0704Y                                  P'REGULAR HOURS....'
DREGHRS  00040722Y  YN    Z
D            0904Y                                  P'REGULAR RATE.....'
DREGRTE  00040922Y  YN    Z
D            1104Y                                  P'OVERTIME HOURS...'
DOVRHRS  00041122Y  YN    Z
D            1304Y                                  P'OVERTIME RATE....'
DOVRRTE  00041322Y  YN    Z
```

Figure 8-8. Specifications for a WSU Program Generated by SDA

```
A

FTRANSFL U     250  50  6AI     1 DISK                    U
ITRANSFL     02
I                                     000100060EMPNUM
I                                     00070020 EMPNAM
I                                     002100242REGHRS
I                                     002500282REGRTE
I                                     0029003220VRHRS
I                                     0033003620VRRTE
```

Figure 8-9. WSU F- and I-Specifications Created with SEU for the Transaction File

```
B

FMASTERFLU     288  36  6AI     1 DISK                    U
IMASTERFL    01
I                                     000100060EMPNUM
I                                     00070020 EMPNAM
I                                     002100242REGHRS
I                                     002500282REGRTE
I                                     0029003220VRHRS
I                                     0033003620VRRTE
```

Figure 8-10. WSU F- and I-Specifications Created with SEU for the Master File

If you select option 8 on the SDA menu and enter WSU on the next display that appears, the display shown in Figure 8-11 will appear. This example shows the entries that you will have to make.

```
PROGRAM TYPE (ENTER T, U, A, OR I) ..... A
FORMAT MEMBER NAME ..................... TIMECD01
TRANSACTION FILE NAME ..................
TRANSACTION FILE MEMBER NAME ...........
MASTER FILE NAME ....................... MASTERFL
MASTER FILE MEMBER NAME................. B
KEY FIELD NAMES ..................... NAME 1 EMPNUM
                ..................... NAME 2
                ..................... NAME 3
AVAILABLE INDICATOR .................... 89
```

Figure 8-11. Display Used to Fill J-, T-, and M-Specifications

Explanation of Entries to Figure 8-11

Item		Explanation
PROGRAM TYPE	T	Write records in a transaction file only. The name, and the member name, of the transaction file must be specified. The master file name and the name of the source member containing the master file specifications can be given, but are not required. The transaction file's record identifying indicator must be the same as the Available Indicator currently prompted for on this display.
	I	Read records from a master file. Inquiries to one master file are supported. The display format designated as the primary format must contain the key field names. Writing in a transaction file is not supported.
	U	Read and update records in a master file, and record the changes in a transaction file. The master file name and the name of the source member containing the master file's F- and I-specifications must be specified, and one or more key field names are required. The file name and the name of the source member containing the transaction file's F- and I-specifications can be given, but are not required.
	A	Add records to, read records from, and update records in a master file, and record the changes in a transaction file. (The transaction file name and the transaction file member name may be given, but they are not required.) The master file name, the master file member name, and one or more key field names are required.
FORMAT MEMBER NAME		The name of the load module in which the formats for the generated WSU program will be stored by $SFGR. This name may be entered, or the default may be chosen. The default name is the source member name (supplied when the SDA procedure was loaded) with the characters 01 appended. If the source member name is longer than 6 characters, the 01 will take the place of the excess characters. This name is included in the WSU J-specification.
TRANSACTION FILE NAME		The name of the transaction file that will receive transaction file records written by the generated WSU program. The name will be included on the generated WSU T-specification and on the generated WSU C-specifications that write records to the transaction file.

Item	Explanation
TRANSACTION FILE MEMBER NAME	The name of the source member that contains the RPG II F- and I-specifications that define the transaction file. This name is included on the generated WSU T-specification.
MASTER FILE NAME	The name of the master file that will be updated or inquired by the generated WSU program. This name will be included on the generated WSU M-specification and on the generated C-specifications that read records from and write records to the master file.
MASTER FILE MEMBER NAME	The name of the source member that contains the RPG II F- and I-specifications that define the master file. This name is included on the generated WSU M-specification.
KEY FIELD NAMES	The field names corresponding to the key field names in the master file. Up to three key field names may be entered. These names are included on the generated WSU M-specification and on the generated C-specifications; the names are used for update or inquiry functions.
AVAILABLE INDICATOR	An indicator (01 through 89) that is available for use by the generated WSU C-specification. The default indicator is 89. For programs that write records to a transaction file, this indicator must be the same as the record identifying indicator specified in the RPG II I-specifications for the transaction file. Use the Field Exit key to exit from this field.

Press the Enter/Rec Adv key after making the last entry. If a required entry is omitted, the letter E is inserted at the end of the omitted line, and the display is reissued.

If you are creating a T type program, SDA generates the WSU source, and the SDA menu is displayed.

If you are creating a U, A, or I type program, the following display appears (this example shows the entries that have already been made):

```
FORMAT NAME ..................................................  TIMECDA
ENTER RELATED RECORD IDENTIFYING INDICATORS     INDICATOR 1 ...  01
                                                INDICATOR 2 ...
                                                INDICATOR 3 ...
ENTER ANY CHARACTER TO DESIGNATE THIS FORMAT AS PRIMARY .......  B
```

Explanation of Entries:

FORMAT NAME	The name of the display screen format for which the record identifying indicators are being prompted. Based on the response to the indicator prompts, C-specifications are generated; these specifications cause the display of the format to be conditioned by the record identifying indicator.
ENTER RELATED RECORD . . . INDICATOR 1, 2, 3	The record identifying indicators condition the display format identified in the Format Name entry. Up to three record identifying indicators may be entered. The indicators must correspond to the indicators defined onthe RPG II I-specifications for the master file. If you enter an indicator, use the Field Exit key to exit from the field. If you do not enter an indicator, the field must be blank.
ENTER ANY CHARACTER . . .	Entering any character identifies this display screen format as the primary screen format. The first display screen format in the member is used as the primary screen format if no other format is designated as the primary screen format. The primary screen format must contain a key field.

Refer to the *WSU Reference Manual* for more information.

C-Specification Subroutine Generated by SDA

After you have completed the prompting displays, SDA generates the WSU C-specifications to support the program type requested in Figure 8-10 as follows:

Write Records to a Transaction File Only

If T is entered in response to the Program Type prompt, a WSU C-specification subroutine that supports the displaying of one format is generated. When you run the compiled WSU program:

- Pressing command function key 9 causes the record to be written (by a PUT operation) to the transaction file and a RECORD WRITTEN message to appear (by an IMSG operation).
- Pressing command function key 8 or the Enter/Rec Adv key causes the format to be redisplayed.

Only one transaction file record type can be written; that is, only one record identifying indicator is used to write records to the transaction file. The record identifying indicator used for the PUT operation is the same as the entry to the Available Indicator prompt; that is, the record identifying indicator used on the RPG II I-specification for the transaction file must be the same as the entry to the Available Indicator prompt.

Update Records in a Master File

If U is entered in response to the Program Type prompt, a WSU C-specification subroutine is generated that supports the displaying of up to 31 formats. Updating one master file and writing to one transaction file (if given) are supported. The display format that is designated as the primary format must contain the key field name or names. When you run the compiled WSU program:

- Entering data in the key field on the primary format and pressing the Enter/Rec Adv key causes the master file record identified by that key field to be read. Based upon the record identifying indicator that is turned on (if any), a format is displayed, showing the data read from the master file record.
- Pressing command function key 9 causes the record in the master file to be updated (by a PUT operation) and a RECORD WRITTEN message to appear (by an IMSG operation).
- Pressing the Reset and Enter/Rec Adv keys causes the primary format to be redisplayed after a record has been written to the master file. Command function key 8 can be used to return to the primary format at any time in the WSU program.

Tests are performed to detect the situation in which a master file record is read, the displayed data is changed, and the *key field* is changed before the record is written back to the master file. If this situation occurs, the wrong record in the master file is updated because of the changed key field. If this situation occurs and you press command function key 9, the message INVALID UPDATE appears (by an MSG operation), and the primary format is redisplayed.

The message NO RECORD FOUND appears (by an MSG operation) if no record corresponding to the entered key field is found. The message UNDEFINED RECORD appears (by an IMSG operation) when the master file that is read fails to turn on one of the record identifying indicators conditioning the displaying of a format.

Add Records to and Update Records in a Master File

If A is entered in response to the Program Type prompt, a WSU C-specification subroutine is generated that supports the displaying of up to 31 formats. Adding to and updating one master file and writing to one transaction file are supported. The display format that is designated as the primary format must contain the key field name or names. When you run the compiled WSU program:

- Entering data in the key field, together with additional data in other fields in the primary format and pressing command function key 10 causes the record to be added (by a PUTN operation) to the master file. The record identifying indicator used for the PUTN operation is the first indicator specified in the primary format. If no record identifying indicator was specified in the primary format, you must add the indicator with SEU or SDA option 6 before you compile the WSU source program.

- Entering data in the key field in the primary format and pressing the Enter/Rec Adv key causes the master file record identified by that key field to be read. Based upon the record identifying indicator that is turned on (if any), a format is displayed, showing the data read from the master file record.

- Pressing command function key 9 causes the record to be updated (by a PUT operation) in the master file and a RECORD WRITTEN message to appear (by an IMSG operation).

- Pressing the Reset and Enter/Rec Adv keys causes the primary format to be redisplayed after a record has been written to the master file. Command function key 8 can be used to return to the primary format at any time in the WSU program.

Tests are performed to detect the situation in which a master file record is read, the displayed data is changed, and the *key field* is changed before the record is written back to the master file. If this situation occurs, the wrong record in the master file is updated because of the changed key field. If this situation occurs and you press command function key 9, the message INVALID UPDATE appears (by an MSG operation), and the primary format is redisplayed.

The message NO RECORD FOUND appears (by an MSG operation) if no record corresponding to the entered key field is found. The message UNDEFINED RECORD appears (by an IMSG operation) when the master file record that is read fails to turn on one of the record identifying indicators conditioning the displaying of a format.

Inquire Function for a Master File

If I is entered in response to the Program Type prompt, a WSU C-specification subroutine that supports the displaying of up to 31 formats is generated. Inquiries to one master file are supported. Writing to a transaction file is not supported. The display format that is designated as the primary format must contain the key field name or names. When you run the compiled WSU program:

- Entering data in the key field on the primary format and pressing the Enter/Rec Adv key causes the master file record identified by that key field to be read. Based upon the record identifying indicator that is turned on (if any), a format is displayed, showing the data read from the master file record.

- Pressing the Reset and Enter/Rec Adv keys causes the primary format to be redisplayed after a record has been read from the master file. Command function key 8 can be used to return to the primary format at any time in the WSU program.

The message NO RECORD FOUND appears (by an MSG operation) if no record corresponding to the entered key field is found. The message UNDEFINED RECORD appears (by an IMSG operation) for the situation in which the master file record that is read fails to turn on one of the record identifying indicators conditioning the displaying of a format.

Additional Considerations

To support the review mode of WSU, SDA uses a blank nondisplayable format named @@BLANK@ as the first format in the generated WSU source program. This format is added so that the IJ/IW processing levels are completed before the generated WSU subroutine is first executed. The addition of the blank format limits the number of formats that can be referenced by the generated WSU program to 31. After the WSU source program has been generated by SDA, the blank format is part of the source. If the WSU source is reentered to SDA option 8, SDA tests for the @@BLANK@ format so as not to include a second @@BLANK@ format. Do not use the name @@BLANK@ as a WSU format name because SDA will exclude it from the generated WSU source program.

The WSU source program created by SDA replaces the source member (entered to SDA) in the output library with the source name that was supplied when SDA was loaded. You can make changes or additions to the SDA generated WSU program by using SEU or SDA option 6. You must create the RPG II F- and I-specifications for the transaction and/or master files before compiling the generated WSU program.

The generated WSU program does not support preprocessing of format sequencing.

Figure 8-12 shows the specifications generated by SDA for an update and add function WSU source program. Figure 8-13 shows the compiled WSU program. Figure 8-14 shows the messages associated with Figure 8-13.

```
JTIMECDA TIMECD01        TEMLIB
MMASTERFLTEMLIB  B       EMPNUM
S@@BLANK@                            YY    Y
D            0302Y                                 P'@@BLANK@'
C                     SETON                      89
C                     EXSR &IORTN
STIMECDA
D            0335Y                                 P'TIME CARD ENTRY'
D            0504Y                                 P'EMPLOYEE NUMBER'
DEMPNUM  00060520Y  YN   Z
D            0535Y                                 P'EMPLOYEE NAME'
DEMPNAM  00160549Y  Y
D            0704Y                                 P'REGULAR HOURS....'
DREGHRS  00040722Y  YN   Z
D            0904Y                                 P'REGULAR RATE.....'
DREGRTE  00040922Y  YN   Z
D            1104Y                                 P'OVERTIME HOURS...'
DOVHRS   00041122Y  YN   Z
D            1304Y                                 P'OVERTIME RATE....'
DOVRRTE  00041322Y  YN   Z
C                     EXSR &IORTN
CSR          &IORTN   BEGSR
CSR KJ                GOTO &PUTAD
CSR KI                GOTO &PUTD
CSR KH                GOTO &END
CSR 89NRV             GOTO &END
CSR                   MOVE EMPNUM    KEYSV10060
CSR                   GET  MASTERFL            89
CSR 89                MSG  'NO RECORD FOUND   '
CSR 01                PUTS TIMECDA
CSR                   IMSG 'UNDEFINED RECORD  '
CSR                   GOTO &END
CSR          &PUTAD   TAG
CSR                   PUTN MASTERFL            01
CSR                   GOTO &MSGRW
CSR          &PUTD    TAG
CSR          EMPNUM   COMP KEYSV1             8989
CSR          &MSGIR   TAG
CSR 89                MSG  'INVALID UPDATE    '
CSR 89                GOTO &END
CSR                   PUT  MASTERFL
CSR          &MSGRW   TAG
CSR                   IMSG 'RECORD WRITTEN    '
CSR          &END     TAG
CSR                   SETOF                    89
CSR                   PUTS TIMECDA
CSR                   ENDSR
```

Figure 8-12. Generated Update and Add Records to a Master File WSU Source Program

```
0001      JTIMECDA TIMECD01          TEMLIB

0002      MMASTERFLTEMLIB  B         EMPNUM
                  FMASTERFLU      288  36   6AI    1 DISK                    U
0003              IMASTERFL     01
0004              I                                      000100060EMPNUM
0005              I                                      00070020 EMPNAM
0006              I                                      002100242REGHRS
0007              I                                      002500282REGRTE
0008              I                                      002900322OVRHRS
0009              I                                      003300362OVRRTE


0010      S@@BLANK@                          YY   Y

0011      D             0302Y                              P'@@BLANK@'

0012      C                      SETON                   89
0013      C                      EXSR &IORTN


0014      STIMECDA

0015      D             0335Y                              P'TIME CARD ENTRY'
0016      D             0504Y                              P'EMPLOYEE NUMBER'
0017      DEMPNUM   00060520Y  YN   Z
WSU-0111
0018      D             0535Y                              P'EMPLOYEE NAME'
0019      DEMPNAM   00160549Y  Y
WSU-0111
0020      D             0704Y                              P'REGULAR HOURS....'
0021      DREGHRS   00040722Y  YN   Z
WSU-0111
0022      D             0904Y                              P'REGULAR RATE.....'
0023      DREGRTE   00040922Y  YN   Z
WSU-0111
0024      D             1104Y                              P'OVERTIME HOURS...'
```

Figure 8-13 (Part 1 of 2). Compiled WSU Program

```
 0025       DOVRHRS   00041122Y  YN   Z
WSU-0111
 0026       D            1304Y                                  P'OVERTIME RATE....'
 0027       DOVRRTE   00041322Y  YN   Z
WSU-0111


 0028       C                      EXSR &IORTN
 0029       CSR           &IORTN   BEGSR
 0030       CSR KJ                 GOTO &PUTAD
 0031       CSR KI                 GOTO &PUTD
 0032       CSR KH                 GOTO &END
 0033       CSR 89NRV              GOTO &END
 0034       CSR                    MOVE EMPNUM    KEYSV10060
 0035       CSR                    GET  MASTERFL              89
 0036       CSR 89                 MSG  'NO RECORD FOUND   '
 0037       CSR 01                 PUTS TIMECDA
 0038       CSR                    IMSG 'UNDEFINED RECORD  '
 0039       CSR                    GOTO &END
 0040       CSR           &PUTAD   TAG
 0041       CSR                    PUTN MASTERFL              01
 0042       CSR                    GOTO &MSGRW
 0043       CSR           &PUTD    TAG
 0044       CSR           EMPNUM   COMP KEYSV1               8989
 0045       CSR           &MSGIR   TAG
 0046       CSR 89                 MSG  'INVALID UPDATE    '
 0047       CSR 89                 GOTO &END
 0048       CSR                    PUT  MASTERFL
 0049       CSR           &MSGRW   TAG
 0050       CSR                    IMSG 'RECORD WRITTEN    '
 0051       CSR           &END     TAG
 0052       CSR                    SETOF                      89
 0053       CSR                    PUTS TIMECDA
 0054       CSR                    ENDSR
```

Figure 8-13 (Part 2 of 2). Compiled WSU Program

```
  EXTENDED DIAGNOSTICS
  NOTE#          STMT#
WSU-0262           0011
WSU-0262           0015
WSU-0262           0016
WSU-0262           0018
WSU-0262           0020
WSU-0262           0022
WSU-0262           0024
WSU-0262           0026


  INDICATORS USED
    RV KH KI KJ 01 89



MODE LEVEL DATA FIELD NAMES USED
  NAME        STMT#     LNG     DEC     DISP
  *RLNO       RSVD      006       0     0032
  *SLNO       RSVD      002       0     0038
  EMPNUM      0004      006       0     0008
  EMPNAM      0005      014       A     000E
  REGHRS      0006      004       2     001C
  REGRTE      0007      004       2     0020
  OVRHRS      0008      004       2     0024
  OVRRTE      0009      004       2     0028
  KEYSV1      0034      006       0     002C

SESSION LEVEL DATA FIELD NAMES
  NAME        STMT#     LNG     DEC     DISP
  *RLRN       RSVD      006       0     0000
  *WSID       RSVD      002       A     0006

JOB LEVEL DATA FIELD NAMES USED
  NAME        STMT#     LNG     DEC     DISP
  UDAY        RSVD      002       0     003B
  UMONTH      RSVD      002       0     003D
  UYEAR       RSVD      002       0     003F
  UDATE       RSVD      006       0     0041
  *ERROR      RSVD      004       0     0047

PROGRAM LABEL NAMES USED
  NAME        STMT#     TYPE
  &IORTN      0029      BEGSR
  &PUTAD      0040      TAG
  &PUTD       0043      TAG
  &END        0051      TAG
  &MSGRW      0049      TAG


MAIN STORAGE REQUIREMENTS FOR WSU PROGRAM EXECUTION          MINIMUM         MAXIMUM
 BYTES REQUIRED PER WORK STATION                                  30             198
 TIMES MAXIMUM NUMBER OF WORK STATIONS                             1               1
 PLUS ADDITIONAL STORAGE REQUIRED                               9080           30232
 YIELDS STORAGE REQUIRED FOR EXECUTION                          9110           30430

 REGION REQUIRED FOR EXECUTION                                   10K             30K


DISK STORAGE REQUIREMENTS FOR WSU EXECUTION PROGRAM WORKFILE
 SECTORS REQUIRED PER WORK STATION                                12
 TIMES MAXIMUM NUMBER OF WORK STATIONS                             1
 PLUS ADDITIONAL DISK SECTORS REQUIRED                            15
 YIELDS MINIMUM DISK SECTORS REQUIRED                             27

 EXECUTION WORKFILE SIZE IN BLOCKS                                 3



PROCEDURE CREATED FOR EXECUTION
 // ATTR NEP=NO,MRTMAX=1
 // REGION SIZE=14
 // LOAD #WSXI1
 // FILE NAME=MASTERFL,DISP=OLD
 // RUN
 // WSX OBJLIBR=TEMLIB,OBJMBR=TIMECDA,FMTLIBR=TEMLIB,FMTMBR=TIMECD01
 // END
```

Figure 8-14. Messages Associated with Figure 8-13

Figures 8-15 and 8-16 show the prompting display and the generated WSU source program that writes records to a transaction file. Figures 8-17 and 8-18 show the prompting displays and the generated WSU source program that updates records in a master file. Figures 8-19 and 8-20 show the prompting displays and the generated inquire function WSU source program.

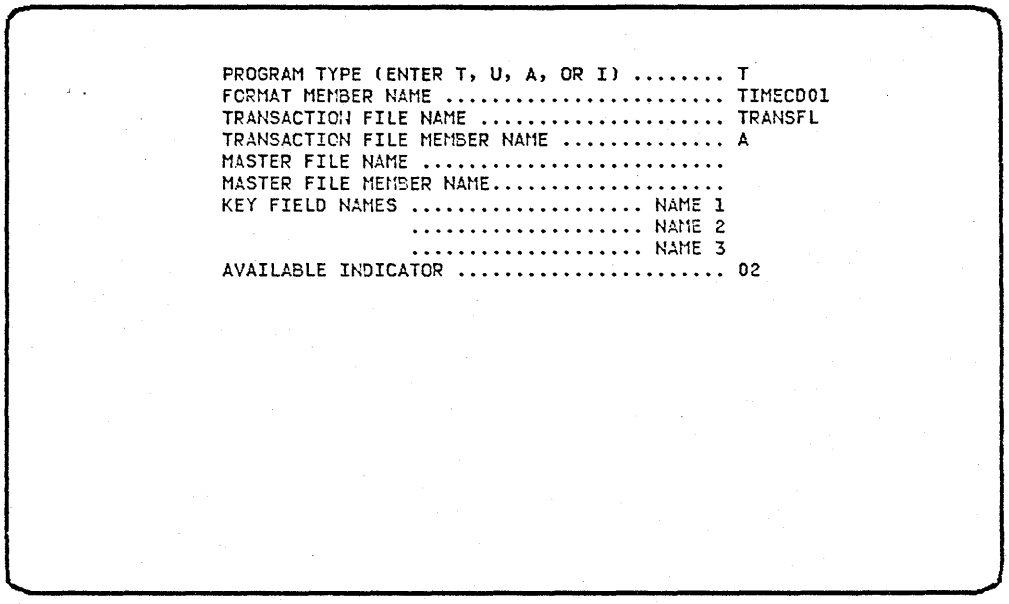


Figure 8-15. Prompting Display for a WSU Source Program That Writes Records to a Transaction File

```
JTIMECDT TIMECD01         TEMLIB
TTRANSFL TEMLIB  A
S@@BLANK@                                YY     Y
D              0302Y                                  P'@@BLANK@'
C                      SETON                        02
C                      EXSR &IORTN
STIMECDT
D              0335Y                                  P'TIME CARD ENTRY'
D              0504Y                                  P'EMPLOYEE NUMBER'
DEMPNUM   00060520Y  YN    Z
D              0535Y                                  P'EMPLOYEE NAME '
DEMPNAM   00140550Y  Y
D              0704Y                                  P'REGULAR HOURS....'
DREGHRS   00040722Y  YN    Z
D              0904Y                                  P'REGULAR RATE.....'
DREGRTE   00040922Y  YN    Z
D              1104Y                                  P'OVERTIME HOURS...'
DOVRHRS   00041122Y  YN    Z
D              1304Y                                  P'OVERTIME RATE....'
DOVRRTE   00041322Y  YN    Z
C                      EXSR &IORTN
CSR            &IORTN  BEGSR
CSR KI                 GOTO &PUTD
CSR KH                 GOTO &END
CSR 02NRV              GOTO &END
CSR                    PUTS TIMECDT
CSR            &PUTD   TAG
CSR                    PUT  TRANSFL                 02
CSR                    IMSG 'RECORD WRITTEN     '
CSR            &END    TAG
CSR                    SETOF                        02
CSR                    PUTS TIMECDT
CSR                    ENDSR
```

Figure 8-16. Generated WSU Program That Writes Records to a Transaction File

```
PROGRAM TYPE (ENTER T, U, A, OR I) ..... U
FORMAT MEMBER NAME ..................... TIMECD01
TRANSACTION FILE NAME ..................
TRANSACTION FILE MEMBER NAME ...........
MASTER FILE NAME ....................... MASTERFL
MASTER FILE MEMBER NAME................. B
KEY FIELD NAMES ..................... NAME 1 EMPNUM
                  ..................... NAME 2
                  ..................... NAME 3
AVAILABLE INDICATOR .................... 89
```

```
FORMAT NAME ..................................................... TIMECDU
ENTER RELATED RECORD IDENTIFYING INDICATORS     INDICATOR 1 ...  01
                                                INDICATOR 2 ...
                                                INDICATOR 3 ...
ENTER ANY CHARACTER TO DESIGNATE THIS FORMAT AS PRIMARY .......  A
```

Figure 8-17. Prompting Displays for a WSU Source Program That Updates Records in a Master File

```
JTIMECDU TIMECD01         TEMLIB
MMASTERFLTEMLIB  B        EMPNUM
S@@BLANK@                          YY    Y
D              0302Y                                  P'@@BLANK@'
C                      SETON                       89
C                      EXSR &IORTN
STIMECDU
D              0335Y                                  P'TIME CARD ENTRY'
D              0504Y                                  P'EMPLOYEE NUMBER'
DEMPNUM   00060520Y  YN    Z
D              0535Y                                  P'EMPLOYEE NAME '
DEMPNAM   00140550Y  Y
D              0704Y                                  P'REGULAR HOURS....'
DREGHRS   00040722Y  YN    Z
D              0904Y                                  P'REGULAR RATE.....'
DREGRTE   00040922Y  YN    Z
D              1104Y                                  P'OVERTIME HOURS...'
DOVRHRS   00041122Y  YN    Z
D              1304Y                                  P'OVERTIME RATE....'
DOVRRTE   00041322Y  YN    Z
C                      EXSR &IORTN
CSR          &IORTN    BEGSR
CSR KI                 GOTO &PUTD
CSR KH                 GOTO &END
CSR 89NRV              GOTO &END
CSR                    MOVE EMPNUM    KEYSV10060
CSR                    GET  MASTERFL              89
CSR 89                 MSG  'NO RECORD FOUND    '
CSR 01                 PUTS TIMECDU
CSR                    IMSG 'UNDEFINED RECORD   '
CSR                    GOTO &END
CSR          &PUTD     TAG
CSR          EMPNUM    COMP KEYSV1                8989
CSR          &MSGIR    TAG
CSR 89                 MSG  'INVALID UPDATE     '
CSR 89                 GOTO &END
CSR                    PUT  MASTERFL
CSR                    IMSG 'RECORD WRITTEN     '
CSR          &END      TAG
CSR                    SETOF                      89
CSR                    PUTS TIMECDU
CSR                    ENDSR
```

Figure 8-18. Generated WSU Source Program That Updates Records in a Master File

```
PROGRAM TYPE (ENTER T, U, A, OR I) ..... I
FORMAT MEMBER NAME ..................... TIMECD01
TRANSACTION FILE NAME ..................
TRANSACTION FILE MEMBER NAME ...........
MASTER FILE NAME ....................... MASTERFL
MASTER FILE MEMBER NAME................. B
KEY FIELD NAMES ................... NAME 1 EMPNUM
                ................... NAME 2
                ................... NAME 3
AVAILABLE INDICATOR .................... 89
```

```
FORMAT NAME ..................................................  TIMECDI
ENTER RELATED RECORD IDENTIFYING INDICATORS     INDICATOR 1 ...  01
                                                INDICATOR 2 ...
                                                INDICATOR 3 ...
ENTER ANY CHARACTER TO DESIGNATE THIS FORMAT AS PRIMARY .......  C
```

Figure 8-19. Prompting Display for an Inquire Function WSU Source Program

```
JTIMECDI TIMECD01         TEMLIB
MMASTERFLTEMLIB  B        EMPNUM
S@@BLANK@                          YY     Y
D              0302Y                                  'P'@@BLANK@'
C                        SETON                       89
C                        EXSR &IORTN
STIMECDI
D              0335Y                                    P'TIME CARD ENTRY'
D              0504Y                                    P'EMPLOYEE NUMBER'
DEMPNUM   00060520Y  YN    Z
D              0535Y                                    P'EMPLOYEE NAME '
DEMPNAM   00140550Y  Y
D              0704Y                                    P'REGULAR HOURS....'
DREGHRS   00040722Y  YN    Z
D              0904Y                                    P'REGULAR RATE.....'
DREGRTE   00040922Y  YN    Z
D              1104Y                                    P'OVERTIME HOURS...'
DOVRHRS   00041122Y  YN    Z
D              1304Y                                    P'OVERTIME RATE....'
DOVRRTE   00041322Y  YN    Z
C                        EXSR &IORTN
CSR            &IORTN    BEGSR
CSR KH                   GOTO &END
CSR 89                   GOTO &END
CSR                      GET  MASTERFL               89
CSR 89                   MSG  'NO RECORD FOUND    '
CSR 01                   PUTS TIMECDI
CSR                      IMSG 'UNDEFINED RECORD   '
CSR                      GOTO &END
CSR            &END      TAG
CSR                      SETOF                       89
CSR                      PUTS TIMECDI
CSR                      ENDSR
```

Figure 8-20. Generated Inquire Function WSU Source Program

Appendix A. SDA Recovery Following an Abnormal Termination

CREATE, ADD, UPDATE, DELETE, AND WSU PROGRAM/RPG SKELETON PROGRAM BUILD

Recovery must be done at the display station where the failure occurred.

After an abnormal termination, the temporary work file used by SDA still exists. When SDA is initiated, it checks to see if a temporary work file already exists. The existence of a file indicates that the previous SDA job that was run from the requesting display station was abnormally terminated and that recovery procedures are required. If a temporary work file does exist, SDA displays the SDA Recovery display shown in Figure A-1.

On the 1920-Character Display:

```
                                SDA RECOVERY
    SOURCE FOR THE FOLLOWING FORMATS EXISTS IN THE WORK AREA:

 EMPMAS    SECOND    THIRD



NOTE:  IF NO FORMAT NAMES ARE DISPLAYED THEN NO FORMAT WAS COMPLETED;
       OPTION 1 IS RECOMMENDED. ***RPG/WSU** INDICATES SOURCE IN WORK AREA.

 OPTION 0: THE WORK AREA IS COPIED, USING THE LIBRARY NAME AND SOURCE
 MEMBER NAME DISPLAYED BELOW. THE WORK AREA IS DELETED AND SDA CONTINUES.

 SOURCE NAME-     A          LIBRARY NAME-         #LIBRARY

 OPTION 1: THE WORK AREA IS DELETED, SDA CONTINUES.

 OPTION 2: SDA TERMINATES WITH NO ACTION TAKEN.

 ENTER OPTION NUMBER          _
```

On the 960-Character Display:

```
   SDA RECOVERY   SOURCE FOR THE FOLLOWING FORMATS EXISTS IN THE WORK AREA:
EMPMAS   SECOND   THIRD


NOTE:  IF NO FORMAT NAMES ARE DISPLAYED THEN NO FORMAT WAS COMPLETED;
       OPTION 1 IS RECOMMENDED. ***RPG/WSU** INDICATES SOURCE IN WORK AREA.
 OPTION 0: THE WORK AREA IS COPIED, USING THE LIBRARY NAME AND SOURCE
 MEMBER NAME DISPLAYED BELOW. THE WORK AREA IS DELETED AND SDA CONTINUES.
 SOURCE NAME-     A          LIBRARY NAME-         #LIBRARY
 OPTION 1: THE WORK AREA IS DELETED, SDA CONTINUES.
 OPTION 2: SDA TERMINATES WITH NO ACTION TAKEN.      ENTER OPTION LNUMBER _
```

Figure A-1. SDA Recovery Display

You can then choose one of the following options:

Option 0: The contents of the temporary work file are copied to the source member specified for this SDA run, and the temporary work file is deleted.

Option 1: The temporary work file is deleted. Any information that was in the work file is lost.

Option 2: The SDA job terminates. No other action is taken.

The option you select and the amount of information you can recover depend upon the SDA function that was being used and at what point in the processing the termination occurred:

- If the termination occurred while the temporary work file was being deleted, the contents of the work file have already been placed in the source member. You can select option 1, which deletes the work file.

- If the termination occurred during a create operation, any data that can be recovered is in the work file. Select option 0 to copy the contents of the work file into the source member.

  Note: It is possible that the last eight $SFGR records that had been printed and the display screen entries that had not yet been processed when the termination occurred may be lost.

- If the termination occurred during an add or update operation, do the following:
  - Select option 2 to terminate the SDA job.
  - Initiate another SDA job by using an alternative source member name.
  - When the SDA recovery display appears, select option 0 to copy the contents of the work file into the alternative source member.
  - Use the LISTLIBR procedure to print the contents of both the original source member and the alternative source member. (If the original source member does not exist, then the abnormal termination occurred while SDA was replacing the source member. In that case, the alternative source member contains all of the data. You can use the LIBRLIBR procedure to recreate the original source member and to copy the contents of the alternative member into it. Then, go to step 7.) For information about the LIBRLIBR and LISTLIBR procedures, see the *System Support Reference Manual.*
  - If an add operation was being performed, compare the listings of the alternative member and the original source member. The member with the most statements contains the most useful source data. If the alternative source member contains more statements than the original source member, use the LIBRLIBR procedure to copy the alternative source member to the original source member.
  - If an update operation was being performed, only those formats that were updated or skipped are in the alternative source member. Compare the contents of the two members. You can then use the SEU function of SDA to place the updated format statements from the alternative source member into the original source member. Then delete the corresponding unupdated statements from the original member.
  - Use the REMOVE procedure to delete the alternative source member. For information about the REMOVE procedure, see the *System Support Reference Manual.*

- If the termination occurred during a delete operation, you should select option 1 and rerun the delete operation.

- If the termination occurred during the RPG II function of SDA and if most of the RPG II source specifications were already generated, you can select option 0 to copy the work file into the source member. (Make sure that the source member name specified for the SDA recovery run is the same as the RPG II source program name specified in Figure 8-4.) You can then use the SEU function of SDA to place the remaining RPG II source specifications into the source member. If you do not want to generate the remaining RPG II specifications yourself, you can select option 1 to delete the work file; then rerun the SDA job that abnormally terminated. To determine which RPG II source specifications have been generated, follow the method described in steps 1 through 4 and 7 above.

- If the termination occurred during the WSU function of SDA and if the WSU C-specifications were already generated, you can select option 0 to copy the work file into the source member. If termination occurred before the WSU C-specifications were generated you can select option 1 to delete the work file; then rerun the SDA job that abnormally terminated. To determine which RPG II source specifications have been generated follow the method described in steps 1 through 4 and 7 above.

MENU BUILD

- If the termination occurred while you were entering information during a menu create or update operation, you must rerun SDA and reenter all of the information that you entered during the terminated job.

- If the termination occurred during a menu create or update operation, if you pressed command function key 7 or finished entering information into the last display, and if the BLDMENU procedure did not begin executing, then one of the source members may be lost and must be reentered. Run SDA and select the menu update option. If both source members exist, update them or verify that they are correct; then press command function key 7 to run the BLDMENU procedure. If only the display text source member exists, you must use the REMOVE procedure to delete it; then use SDA to recreate the entire menu. For information about the REMOVE procedure, see the *System Support Reference Manual.*

  Note: Even if an existing menu is being updated, one of the existing source members can be lost if the termination occurs at this point in SDA processing.

- If the termination occurred while the BLDMENU procedure was running, the source members are intact. You can run SDA and select the update option. After verifying that the information in the source member is correct, press command function key 7 to run the BLDMENU procedure.

Appendix B. How to Use SDA to Create WSU and RPG Programs

You can use SDA to create display formats for WSU or RPG programs. Decide which type of program you are going to use before creating your formats. When you have decided, design your program and use SDA to help you complete it.

CREATING A WSU PROGRAM

Figure B-1 shows the work flow required to create a WSU program by using SDA. When you have completed your application design work, use SDA option 1 to create your formats. Replace the SDA-generated field names with the names you need. Use SDA option 8 to create the basic program type (such as inquiry, update, add, or transaction) you desire. Then select SDA option 6 (single statement entry) and use the SEU insert mode to add to or update the additional WSU statements (J, T, M, and C) that your program requires. When all of your source statements are entered, end SDA and call the WSU generator. SDA can be called again to correct any program or format errors.

When all generation errors have been corrected, you are ready to test your program. If you now have execution errors or you want to make additional changes to formats, select SDA option 3 (update) or option 6 (SEU) and make your changes. Continue to regenerate and retest your program until it is correct.

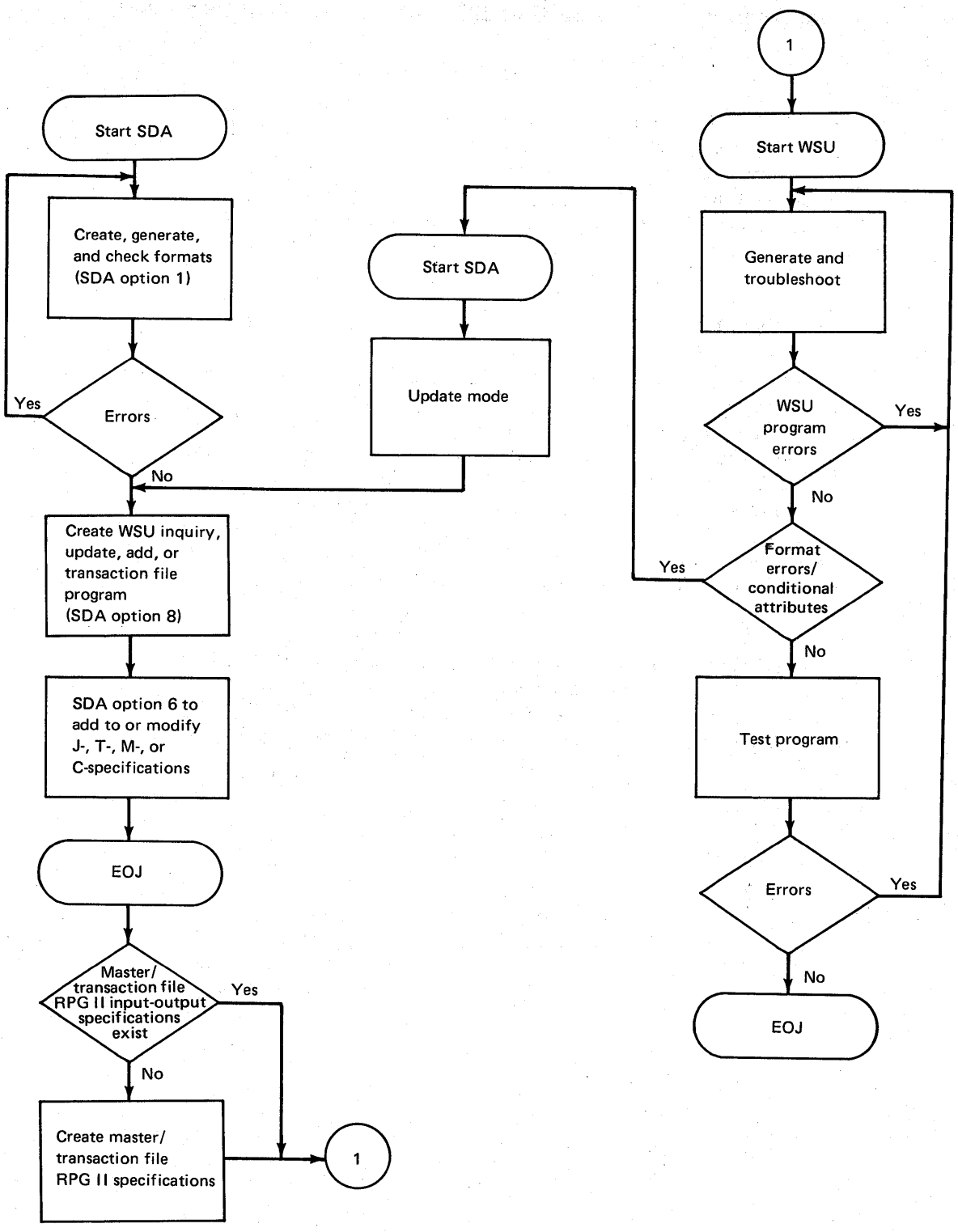


Figure B-1. Using SDA with WSU

CREATING AN RPG PROGRAM

Figure B-2 shows the work flow required to create an RPG program by means of SDA. When you have completed your application design work, use SDA to:

- Create your display formats
- Replace the SDA-generated field names with the ones you need
- Generate the object formats
- Display the formats so you can verify them
- Correct errors in the formats
- Build a skeleton RPG program

After you have generated the RPG skeleton program, you can use SDA option 6 (SEU) to add the remainder of the RPG logic for the application. You should then compile and debug the new module.

When all compiler errors are removed, you should test the program. Use SEU to correct any errors in the program and recompile and test. If there are errors in the display formats, you can use SDA option 3 (update) to correct them. Then use SDA option 8 (RPG skeleton build) to build a new skeleton program. Then use SDA option 6 (SEU) to include the new skeleton RPG program in your existing RPG application program. Recompile and retest your RPG program. When you are finished testing, you can delete the RPG skeleton program created by SDA. (SDA will replace whatever you have in the module identified as your skeleton program. For this reason, you should use a 'work' name for the RPG skeleton program so that you do not inadvertently delete your completed RPG program.)

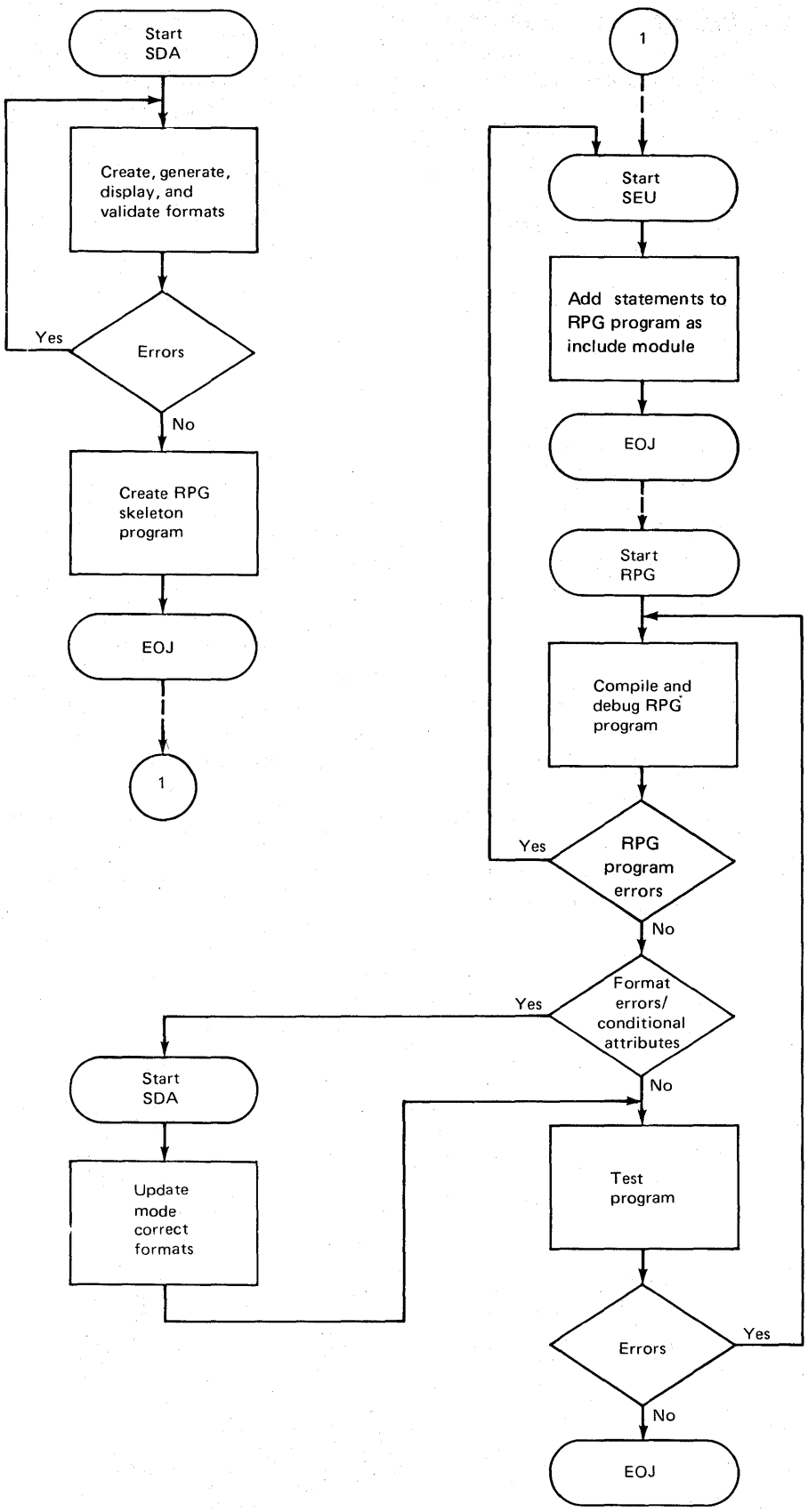
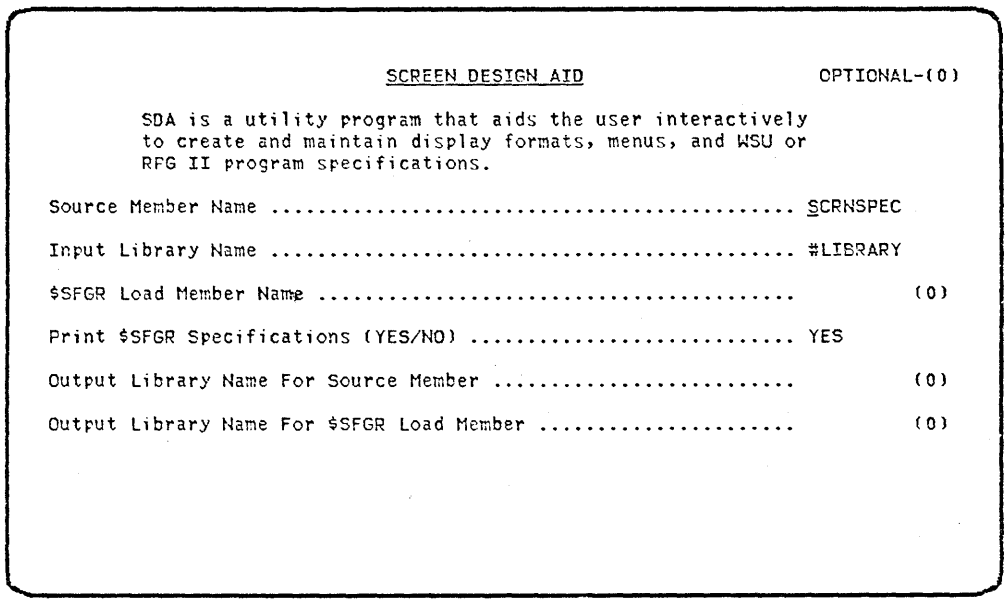


Figure B-2. Using SDA with RPG

Appendix C. HELP SDA Display

Entering the HELP SDA command causes the following screen to be displayed:



You can then use this display to enter any SDA sign-on parameter. Defaults are displayed, but you may enter your own parameters in place of the defaults.

When you have entered the parameters you desire, press the Enter/Rec Adv key, and the SDA menu will be displayed.

Glossary

alphameric: Synonymous with alphanumeric (A/N). See *alphanumeric (A/N)*.

alphanumeric (A/N): Consisting of both letters and numbers and often other symbols (such as punctuation marks and mathematical symbols). Contrast with ideographic character.

blank: (1) The storage equivalent of hexadecimal 40. (2) The space on a document or form or display caused by the absence of a printed or written character.

byte: A sequence of eight adjacent bits that are operated on as a unit and that make up the smallest addressable unit in the System/34.

character: A digit, letter, or other symbol that is used as part of the control, organization, or representation of data.

character set: A defined collection of graphic symbols.

command keys: The keys on the top row of the display station keyboard that are used with the Cmd function key to request functions.

data: A collection of facts, numbers, letters, or symbols that can be processed by a computer.

data field: One or more bytes of related information in a record.

display: (noun) A visual presentation of data. (verb) To present an image on the display screen.

display name (also Format Name or Display Screen Format Name): The name of the display screen format which is placed in a library load member by the display screen format generator utility program ($SFGR).

error mode: An operating status of SDA, in which the expected results of an operation is not achieved. A message is printed indicating the error condition.

function key: A keyboard key used to request a function and not used to display or print a character. The cursor movement and Help keys are examples of function keys.

hexadecimal: Pertains to a number system with a base of 16. (Valid digits range from 0 through F, where F represents the highest units position-15.)

ideographic: Consisting of both pictograms and graphics and often other types of symbols.

ideographic character set: A character set that contains pictograms or graphics that can be used to represent ideas.

ideographic mode: For WSU, a display station operating mode that an operator requests by specifying Y for the IGC prompt on the sign on display.

ideographic support: The combination of hardware and software elements that allow the use of ideographic data on the System/34.

insert mode: An operating status of SDA in which operators can logically insert data onto the screen format. This occurs when updating an $SFGR/WSU source member.

Katakana: A native Japanese character set that is used to represent the different Japanese sounds.

library: An area on disk that can contain load members, procedure members, source members, and subroutine members.

load member: A collection of instructions that a system can execute to perform a particular function, regardless of whether the function is requested by the operator or specified in an OCL statement. Load members can also contain display screen formats and message members. Load members are stored in a library.

mandatory entry: A field attribute that indicates an operator must key at least one character into the field.

mandatory fill: A field attribute that indicates an operator must key all or none of the field.

menu: A displayed list of items from which the operator makes a selection.

message identification code (MIC): A four digit number that identifies a record in a message member.

MIC: Message identification code.

prompt: A message issued by a program that requests either information or an operator action to continue processing.

protected field: A field on the display in which operators cannot enter data.

SEU: Source entry utility.

shift-in (S/I) control character: A character that indicates the end of a string of ideographic characters. The shift-in control character is represented by hex 0F.

shift-out (S/O) control character: A character that indicates the start of a string of ideographic characters. A shift-out control character is represented by hex 0E.

source entry utility (SEU): A program product the operator uses to enter and update procedures and source programs in a library.

source member: A collection of records that are used as input for a program.

work station: A device that lets a person transmit information to or receive information from a computer, or both, as needed to perform his/her job.

work station utility (WSU): A part of the Utilities Program Product that performs an interactive data entry and edit function.

WSU: Work station utility.

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