

Application System/400



# Application Development ToolSet/400 Advanced Printer Function

*Version 3*

**Note!**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page v.

**First Edition (September 1994)**

This edition applies to Version 3, Release 1, Modification Level 0, of IBM Application Development ToolSet/400 (Program 5763-PW1) and to all subsequent releases and modifications until otherwise indicated in new editions. Make sure you are using the correct edition for the level of the product.

Order publications through your IBM representative or the IBM branch office serving your locality. Publications are not stocked at the address given below.

A form for readers' comments is provided at the back of this publication. If the form has been removed, address your comments to:

IBM Canada Ltd. Laboratory  
Information Development  
2G/345/1150/TOR  
1150 Eglinton Avenue East  
North York, Ontario, Canada. M3C 1H7

You can also send your comments by facsimile (attention: RCF Coordinator), or you can send your comments electronically to IBM. See "Communicating Your Comments to IBM" for a description of the methods. This page immediately precedes the Readers' Comment Form at the back of this publication.

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

© Copyright International Business Machines Corporation 1994. All rights reserved.

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

---

# Contents

<b>Notices</b> . . . . .	v
Trademarks and Service Marks . . . . .	v
<b>About This Book</b> . . . . .	vii
Who Should Use This Book . . . . .	vii
<b>Chapter 1. Advanced Printer Function Overview</b> . . . . .	1
Starting the Advanced Printer Function . . . . .	1
Printing on a Dot Matrix Printer . . . . .	1
Dot Matrix Printer Limitations . . . . .	2
<b>Chapter 2. Symbol Sets</b> . . . . .	3
Creating a Symbol Set . . . . .	4
Copying a Symbol Set . . . . .	4
Viewing a List of Symbol Sets . . . . .	4
Deleting a Symbol Set . . . . .	5
Printing a Symbol Set . . . . .	5
<b>Chapter 3. Symbols</b> . . . . .	7
Symbol IDs . . . . .	7
Specifying Symbol ID Code Lengths . . . . .	7
2-Byte Symbol IDs . . . . .	8
1-to-10-Byte Symbol IDs . . . . .	8
Symbol ID Scanning . . . . .	8
Inserting Symbol IDs . . . . .	8
Creating a Symbol . . . . .	9
Copying a Symbol . . . . .	9
Expanding the Size of a Symbol . . . . .	9
Extending a Symbol Horizontally . . . . .	10
Extending a Symbol Vertically . . . . .	10
Viewing a Large Symbol . . . . .	11
Viewing a List of Symbols . . . . .	11
Deleting a Symbol . . . . .	12
Printing a Symbol . . . . .	12
Improving Printing of Symbols . . . . .	12
<b>Chapter 4. Form Design</b> . . . . .	13
Designing the Layout of a Form . . . . .	13
Adding a Symbol Set to a Form Description . . . . .	14
Bar Codes Introduction . . . . .	15
Adding a Bar Code to a Form Description . . . . .	15
Print Positions for Bar Codes . . . . .	16
Calculating Print Positions for a CODE 39 Bar Code . . . . .	16
Calculating Print Positions for a PLESSEY Bar Code . . . . .	16
Guidelines for Creating Bar Codes . . . . .	16
Specifying Field Lengths . . . . .	17
Overlapping Fields . . . . .	17
Highlighting a Field . . . . .	17
Underlining a Field . . . . .	18
Bar Chart . . . . .	18

Marking the Horizontal or Vertical Axis of a Bar Chart . . . . .	18
Adding a Bar Chart to a Form Description . . . . .	19
Creating a Box on a Form Description . . . . .	19
Copying a Form Description . . . . .	20
Changing a Form Description . . . . .	21
Specifying Constant Fields . . . . .	21
Viewing a List of Form Descriptions . . . . .	21
Viewing a Large Form . . . . .	22
Deleting a Form Description . . . . .	23
Printing a Blank Form . . . . .	23
Printing a Filled Form . . . . .	23
Aligning Data on a Form Description . . . . .	24
<b>Chapter 5. Creating a Spooled File . . . . .</b>	<b>25</b>
Viewing a List of Form Descriptions to Merge . . . . .	25
Merging a Spooled File . . . . .	25
Merge Form Description (MRGFORMD) Command . . . . .	26
Batch Job Prerequisites . . . . .	29
Reducing Printing Time for Spooled Files . . . . .	29
Restrictions on Viewing Spooled Files . . . . .	29
<b>Appendix A. Optical Character Recognition Font A Characters . . . . .</b>	<b>31</b>
Loading IBM OCR-A Characters . . . . .	31
Changing OCR-A Character Examples . . . . .	31
<b>Appendix B. Example Scale and Layout Grids for Form Design . . . . .</b>	<b>33</b>
Forms Design Cutout Scale . . . . .	33
4-by-4 Layout Grid . . . . .	34
9-by-9 Layout Grid . . . . .	35
15-by-15 Logo Layout Grid . . . . .	36
<b>Appendix C. Advanced Printer Function on the AS/400 System and System/36 . . . . .</b>	<b>37</b>
Functional Differences . . . . .	37
Logos . . . . .	37
Alternative Character Sets . . . . .	37
Forms Control Files . . . . .	37
Command Differences . . . . .	38
<b>Bibliography . . . . .</b>	<b>39</b>
<b>Index . . . . .</b>	<b>41</b>

---

## Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM licensed program in this publication is not intended to state or imply that only IBM's licensed program may be used. Any functionally equivalent product, program or service that does not infringe any of IBM's intellectual property rights may be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, is the user's responsibility.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the IBM Director of Licensing, IBM Corporation, 208 Harbor Drive, Stamford, Connecticut, USA 06904-2501.

---

## Trademarks and Service Marks

The following terms, denoted by an asterisk (\*), used in this publication, are trademarks or service marks of International Business Machines Corporation in the United States or other countries:

Application Development	Operating System/400
Application System/400	OS/400
AS/400	PROFS
IBM	400
IBMLink	

The following terms, denoted by a double asterisk (\*\*), used in this publication, are trademarks of other companies as follows:

ANSI	American National Standards Institute
------	---------------------------------------



---

## About This Book

This book provides information and examples to help you learn how to use the advanced printer function (APF) with a 5224 or 5225 dot matrix printer.

APF provides a set of functions that you can use with a 5224 or 5225 dot matrix printer to create, design, print, and merge information into customized forms. The advanced printer function is referred to as *APF* throughout this book.

You may need to refer to other IBM publications for more specific information about a topic. The *Publications Reference*, SC41-3003, provides information on all the publications in the Application System/400 (AS/400) library. To see a list of related publications, refer to the "Bibliography" on page 39.

---

## Who Should Use This Book

This book is intended to be used by system and application programmers to design customized forms. To use this book effectively, you need:

- Working knowledge about how to use your workstation with a 5224 or 5225 dot matrix printer
- General knowledge of the AS/400 system
- Working knowledge of control program concepts

If you are not familiar with your workstation or dot matrix printer, refer to the books that come with it.

The user (described as *you* in this book) refers to the programmer creating, designing, or printing the forms.





---

# Chapter 1. Advanced Printer Function Overview

You can use the advanced printer function (APF) to:

- Create symbols such as logos for a form
- Create symbol sets such as oversized letters for a form
- Design the layout of a form
- Add special features like bar codes, bar charts, boxes, highlighted fields, and underlined fields to a form
- Print blank copies of a form
- Print filled-out copies of a form
- Merge spooled files with a form that you design

APF uses the special print capabilities available on the 5224 Models 1 and 2 and 5225 Models 1, 2, 3, and 4 dot matrix printers to make it appear as though you are using a preprinted form or a printer with a variety of special fonts.

---

## Starting the Advanced Printer Function

You must have authorization to use the Start Advanced Printer Function (STRAPF) command and any files needed for the functions you request. You can obtain the necessary authorization from your security officer.

To start APF interactively and to view the Advanced Printer Function (APF) display, type the following on the command entry display and press Enter:

```
STRAPF
```

---

## Printing on a Dot Matrix Printer

The symbols, text characters, and forms that you create are printed on the 5224 and 5225 dot matrix printers. Dot matrix printers use a pattern of dots to create the printed characters. A dot can be printed almost anywhere on a page and is printed by the print head. Each wire in the print head strikes the paper and leaves a dot. All dots from one strike of the print head are called a print position. The following figure shows a print position consisting of 72 dots arranged in eight horizontal rows, with nine dots in each row (forming nine columns):

```
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....
```

The dots appear separated in this example, which is enlarged so that you can see each dot in the print position. You cannot see this separation when the dots are printed on a 5224 or 5225 dot matrix printer.

## Dot Matrix Printer Limitations

The 5224 and 5225 dot matrix printers can handle almost any print pattern. However, when using extremely dark dot patterns, keep in mind that they:

- Require more frequent ribbon replacement
- Require more passes by the printer and reduce its speed
- Can lead to ribbon snags, paper tears, and missing dots

**Warning:** Do not print a dense dot pattern for a whole page because it may damage your printer.

### Printing on Another Printer

Printing devices other than a 5224 or 5225 dot matrix printer do not print APF special features. Use the Operating System/400\* (OS/400\*) system to remove APF special features from a form description. On other printers and in some situations, no data is printed, or data is printed but does not appear as you expect.

### Changing the Printer Device File

Data is printed using the QPAPFPRT printer device file. QPAPFPRT is a file that is shipped with APF and is necessary for APF to function.

When you use options 3 or 4 from the APF menu or use the MRGFORMD command, APF will not allow you to specify any overrides to QPAPFPRT.

You can specify the parameters for the printer device on the Merge Form Description (MRGFORMD) command, the Print Blank Form display, or the Merge Form Description display.

---

## Chapter 2. Symbol Sets

APF is shipped with three sample symbol sets. Symbols are stored in a symbol set, which is a group of individual symbols stored as a member of a symbol set file. These symbol sets contain 184 characters in the standard multinational character set and are stored in the symbol set file QAAPFILE. You can copy the sample symbol sets, using them as a base to create customized symbols.

The following sample symbol sets are available:

- QAAPF1X1, which contains letters that are one print position wide and 8 rows tall
- QAAPF1X2, which contains letters that are one print position wide and 16 rows tall
- QAAPF2X2, which contains letters that are two print positions wide and 16 rows tall

The sample symbol sets are stored as logical files built over three physical files. The four database files must be saved or restored together. To display the names of the physical files under the logical file, use the Display File Description (DSPFD) command on the logical file.

To create a symbol set file, you need authorization to use the Create Physical File (CRTPF) command, the Create Logical File (CRTLF) command, the Add Physical File Member (ADDPFM) command, and the Add Logical File Member (ADDLFM) command. If you do not have authorization for these commands, you are only authorized to add symbol sets to existing files.

**Note:** The APF symbol set files must be created by APF. If you use the Create Physical File (CRTPF) command to create your own physical file, APF does not recognize the file as a valid APF file.

You can perform the following tasks with symbol sets:

- Create
- Copy
- Delete
- Print

---

## Creating a Symbol Set

To create a symbol set:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 1 (Create) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.
4. Type the character ID length and a brief description of the symbol set on the Create Symbol Set display, and press Enter.

**Note:** No symbols are shown on the display, because you are creating a symbol set.

---

## Copying a Symbol Set

To copy a symbol set:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 3 (Copy) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.
4. Rename the symbol set in the *To symbol set* prompt, and press Enter. You can also change the information in the *To file* prompt, the *To library* prompt, the *Character ID length* prompt, and the *Text* prompt on the Copy Symbol Set display.

---

## Viewing a List of Symbol Sets

To view a list of the symbol sets you created:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Type the file name and the library name on the Work with Symbol Set display.
3. Position the cursor in the *Symbol set* prompt.
4. Press F4.

While viewing a list of symbol sets, you can copy, delete, or print a symbol set, and work with symbols.

---

## Deleting a Symbol Set

To delete a symbol set:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 4 (Delete) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.

The *Option* prompt remains blank to confirm that the symbol set is deleted.

---

## Printing a Symbol Set

To print a symbol set:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 6 (Print) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.

A message at the bottom of the display confirms that the symbol set is being printed.





## 2-Byte Symbol IDs

A 2-byte symbol ID is 2 bytes from your data that are used to identify symbols. For example, when creating a large letter D, you can name the symbol BD to indicate that it is a big D. When using 2-byte symbol IDs, you must create symbols 2 bytes (print positions) wide.

Two-byte symbol IDs increase the number of symbols you can store in a symbol set, the maximum being 8836 characters.

**Note:** You cannot use leading or embedded blanks (spaces that occur between characters within a unit of data) in a symbol ID.

## 1-to-10-Byte Symbol IDs

A 1-to-10-byte symbol ID is the number of bytes between 1 and 10 that is used to identify a symbol. For example, you can name the symbol for a letter D that is 11 print positions wide BIGD, and name the symbol for a letter D that is 20 print positions wide VERYBIGD.

With 1-to-10-byte symbol IDs, you can vary the length of symbol IDs and you have an almost unlimited supply of names.

With 1-byte codes, however, the maximum number of symbols in a symbol set is limited to the number of different characters you can type on your keyboard, which for many users is 94.

**Note:** You cannot use leading or embedded blanks (spaces that occur between characters within a unit of data) in any symbol IDs.

## Symbol ID Scanning

APF searches for symbol IDs in the column number specified by the symbol set. If there is no symbol ID, scanning continues until the next nonblank character within the special feature is found. APF scans for the symbol ID in the specified symbol set when any nonblank character is found. If the symbol is in the symbol set, the correct symbol is inserted in the printed form. Scanning continues for the next symbol ID until processing ends.

## Inserting Symbol IDs

You can either insert a symbol ID as a constant field in a form description or insert a symbol ID in a spooled file to be merged with a form description. When you set up a form description so a symbol set applies to a specific position, the spooled file must contain the appropriate symbol IDs at the position that you specified.

For example, if you position a symbol set at line 3 and column 4 with a width of 10 positions in a form description, the spooled file must contain the symbol ID for that symbol set at line 3 and column 4, and the symbol ID must be 10 print positions wide.



---

## Creating a Symbol

To create a symbol:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 1 (Create) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.
4. Press F6 from the Work with Symbols display.
5. Type the new symbol name, the width and length of the symbol, and a brief text description, and press Enter.
6. Type \* to draw the symbol. The asterisk is used to create the outline of the symbol.

---

## Copying a Symbol

To copy a symbol:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Symbol Set display.
3. Type the file name, the library name and the symbol set name, and press Enter.
4. Select option 3 (Copy) from the Work with Symbols display, and press Enter.
5. Rename the symbol.
6. Type the symbol ID width and length, and a brief text description of the symbol on the Copy Symbol display, and press Enter.

A copy of the symbol is displayed on the Design Symbol display. From this display, you can expand, enlarge, or print the symbol.

---

## Expanding the Size of a Symbol

To enlarge symbols:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.
4. Type 2 (Change) in the *Opt* prompt, and press Enter.

5. Press F9.
6. Type a number in the *Height expansion factor* prompt and in the *Width expansion factor* prompt, and press Enter.

For example, if you specify 2 for both factors, the size of the symbol is doubled. Similarly, if you specify 20, the size of the symbol increases 20 times. The symbol is expanded from left to right and top to bottom regardless of the size of the display. Blanks are also expanded.

**Note:** If you specify a value that enlarges the symbol beyond its original size, your symbol may be truncated when you view it.

7. To exit from the Design Symbol display without saving the symbol, press F3.

## Extending a Symbol Horizontally

To extend the lines of a symbol horizontally:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.
4. Type 2 in the *Opt* prompt, and press Enter.
5. Type either + or =

The plus sign extends the width of the display. The equal sign extends the width of the symbol. When you type either of these signs:

- The sign is replaced with an asterisk
- All blanks following the sign are replaced with asterisks
- All asterisks following the sign are replaced with blanks

6. Press F13.

## Extending a Symbol Vertically

To extend the lines of a symbol vertically:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.
4. Type 2 in the *Opt* prompt, and press Enter.
5. Type either + or =

The plus sign extends the length of the display. The equal sign extends the length of the symbol. When you type either of these signs:

- The sign is replaced with an asterisk
- All blanks following the sign with are replaced with asterisks
- All asterisks following the sign are replaced with blanks

6. Press F14.

## Viewing a Large Symbol

To scroll the display in all directions to examine each part of a large symbol:

1. Select option 1 (Work with Symbol Set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.
4. Type 2 in the *Opt* prompt on the Work with Symbols display, and press Enter.
5. Position the cursor in the *Control* prompt.

When you use the *Control* prompt, each column corresponds to one column of dots within the 8-by-9-dot print position. A single position is 8 rows or the height of one print position, or 9 columns or the width of one print position.

6. Select one of the following options and press enter to scroll the display:

Option	Meaning
W or w	Displays data eight columns (or one print position) to the right
W-	Displays data eight columns (or one print position) to the left
W+n	Displays data that begins <i>n</i> positions to the right
W-n	Displays data that begins <i>n</i> positions to the left
Wn	Displays data beginning in position <i>n</i>
+n	Displays data that is <i>n</i> rows beyond the first row shown
-n	Displays data that is <i>n</i> rows before the first row shown
<i>n</i>	Displays row <i>n</i> as the first row on the display
T	Displays data at the top of the file
B	Displays data at the bottom of the file

**Note:** APF does not automatically clear the *Control* prompt when you press Enter.

7. To exit from the Work with Symbols display, press F3.

---

## Viewing a List of Symbols

To view a list of the symbols that you created:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Type the file name and the library name on the Work with Symbols display.
3. Position the cursor at the *Symbol set* prompt.
4. Press F4.
5. Type 5 (Work with symbols) in the *Opt* prompt, and press Enter.

A list of symbols that are in the symbol set is displayed on the Work with Symbols display. From this display, you can change, copy, delete, or print the symbol.

---

## Deleting a Symbol

To delete a symbol:

1. Select option 1 (Work with symbol set) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) on the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.
4. Type 4 (Delete) beside the symbol to be deleted, and press Enter.

The *Symbol Id* column shows the word \*DELETED.

---

## Printing a Symbol

To print a symbol:

1. Select option 1 (Work with symbol sets) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Symbol Set display.
3. Type the file name, the library name, and the symbol set name, and press Enter.
4. Type 6 (Print) in the *Opt* prompt beside the symbol you want to print, and press Enter.

The option prompt remains blank to confirm that the symbol was printed.

## Improving Printing of Symbols

To improve performance when printing symbols, use the following guidelines:

- Specify a form width of at least 80 characters and a form length of at least 30 lines.
- Specify 9 lines per inch to avoid a horizontal gap in symbols more than one line tall.

You can set these parameters using the Override with Printer File (OVRPRTF) or Change Printer File (CHGPRTF) commands.

---

## Chapter 4. Form Design

When designing the layout of a form, you can perform the following tasks:

- Create a form description
- Specify special features
  - Symbol sets
  - Bar codes
  - Fields set at 10 characters per inch
  - Fields set at 15 characters per inch
  - Highlighting
  - Underlining
  - Bar charts
  - Boxes
- Copy a form description
- Change a form description
- Delete a form description
- Print a blank copy of a form
- Print a filled-out form

---

### Designing the Layout of a Form

To design the layout of a form:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 1 (Create) from the Work with Form Description display.
3. Type the file name, the library name, and the form description name for the form you want to create, and press Enter.
4. Type the characters per inch setting, lines per inch setting, page width, page length, and text description on the Create Form Description display, and press Enter.
5. Specify the fields you want to use as constants in the top part of the Design Form Description display.
6. Specify the special features you want in the prompts in the bottom part of the Design Form Description display. Except for the *Column* and *Width* prompts, the following table shows the prompts in which you specify special features in a form description. The *Column* prompt indicates the starting column number. The *Width* prompt indicates the number of print positions the feature requires. The *Column* and *Width* prompts are not shown in the table, but apply to all features.

<b>Special Feature</b>	<b>PF Key</b>	<i>Opt</i>	<i>Parm 1</i>	<i>Parm 2</i>	<i>Parm 3</i>
Symbol Set	N/A <sup>1</sup>	1	Symbol set name	File name	Library name
Bar Code	N/A	2	Type of bar code: CODE39, UPCA, UPCE, EAN13, EAN8, PLESSEY	Height in lines 4 - 9 Default is 4	N/A
Characters per inch	N/A	3	CPI setting for a field: 10 15	N/A	N/A
Highlighting	N/A	4	N/A	N/A	N/A
Underlining	N/A	5	Underlining options: ALL (default) NONBLANK	N/A	N/A
Bar Chart	N/A	6	Bar chart options: SINGLE EXTEND	N/A	N/A
Box	F9	N/A	N/A	N/A	N/A

<sup>1</sup>N/A stands for not applicable.

- To exit from the Design Form Description display and to save the form description, press F3.

The Work with Form Description display is shown. From this display, you can either create another form description, or copy, change, delete, and print a form description.

---

## Adding a Symbol Set to a Form Description

To add a symbol set to a form description:

- Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
- Select option 2 (Change) from the Work with Form Description display.
- Type the file name, the library name, and the form description name to which you want to add the symbol set, and press Enter.
- On the bottom part of the Design Form Description display, type 1 in the *Opt* prompt, the starting column number in the *Column* prompt, the width of the field in print positions in the *Width* prompt, the symbol set name in the *Parm 1* prompt, the file name in the *Parm 2* prompt, and the library name in the *Parm 3* prompt.
- To exit from the Design Form Description display and to save the form description, press F3.

The Work with Form Description display is shown. From this display, you can create, change, copy, delete, or print a form description.

---

## Bar Codes Introduction

Bar codes identify consumer products by using a series of wide and narrow bars that represent encoded data. You can create the following bar codes on a form description:

- Code 39
- PLESSEY (MSI) modified
- Universal Product Code (UPC) version A
- Universal Product Code (UPC) version E
- European Article Number (EAN) 8 digit
- European Article Number (EAN) 13 digit

## Adding a Bar Code to a Form Description

To add a CODE 39, UPC A, UPC E, EAN 8, EAN 13, or PLESSEY bar code to a form description:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Form Description display.
3. Type the file name, the library name, and the form description name to which you want to add the bar code, and press Enter.
4. Type 2 in the *Opt* prompt, the starting column number in the *Column* prompt, the number of numbers in the bar code in the *Width* prompt, the type of bar code in the *Parm 1* prompt, and a number between 4–9 for the height of the bar code in lines in the *Parm 2* prompt on the bottom part of the Design Form Description display, and press Enter.

The following table shows the type of bar code, the field length the bar code requires in characters per inch, the width of the bar code, and valid entries for each bar code. Specify the applicable value from the Width column in the *Width* prompt on the Design Form Description display.

Type of Bar Code	Characters Per Inch	Width	Valid Entries
CODE39	15	1–32	0–9, A – Z, –, ., \$, /, + and a blank space
PLESSEY	15	1–15	0–9
UPCA	15	11	0–9
UPCE	15	6	0–9
EAN13	15	12	0–9
EAN8	15	7	0–9

5. To exit from the Design Form Description display and to save the form description, press F3.

The Work with Form Description display is shown. From this display, you can create, change, copy, delete, or print a form description.

## Print Positions for Bar Codes

To avoid overlapping of special features on a form description, each bar code requires the following number of print positions:

- The UPC A bar code requires 23
- The UPC E bar code requires 13
- The EAN 13 bar code requires 25
- The EAN 8 bar code requires 17

You must calculate the number of print positions required for CODE 39 bar codes and PLESSEY bar codes. The number of print positions for these bar codes varies, depending on the width you specify for them.

## Calculating Print Positions for a CODE 39 Bar Code

To determine the width of a CODE 39 bar code in print positions at 15 characters per inch, use the following algorithm:

$$\text{CODE 39 width} = [(\text{Number of characters} + 2) * 28] / 9$$

If there is a remainder after the division, add 1 to the result to show the printed width of a CODE 39 bar code. For example, suppose you use 10 digits for your CODE 39 bar code. The printed width, with a remainder, is then:

$$[(10 + 2) * 28] / 9 = 37$$

Because there is a remainder of 37, add 1 to the result. The printed width is 38 print positions at 15 characters per inch.

## Calculating Print Positions for a PLESSEY Bar Code

To determine the width of a PLESSEY bar code in print positions at 15 characters per inch, use the following algorithm:

$$\text{PLESSEY width} = \{[(\text{Number of digits} + 2) * 28] + 13\} / 9$$

If there is a remainder after the division, add 1 to the result to show the printed width of a PLESSEY bar code. For example, suppose you use 10 digits for your PLESSEY bar code. The printed width, with a remainder, is then:

$$\{[(10 + 2) * 28] + 13\} / 9 = 38$$

Because there is a remainder, add 1 to the result. The printed width is 39 print positions at 15 characters per inch.

## Guidelines for Creating Bar Codes

To develop an application using bar codes, use the following guidelines:

- Test bar codes with the scanning device.
- Use nonglossy paper.
- Make sure the printer ribbon is not excessively worn.
- Make sure that data following the bar code is placed so that it does not fall within fields specified as 15 characters per inch. If this occurs, the data is set to blanks before the bar code is inserted.
- Use 9 lines per inch.



- Do not print other symbols, charts, or boxes on the same line.
- Do not use overprinting, highlighting, or underlining on the same line.

---

## Specifying Field Lengths

To specify a field length at 10 characters per inch or 15 characters per inch on a form description:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Form Description display.
3. Type the file name, the library name, and the form description name on which you want to specify the fields, and press Enter.
4. On the bottom part of the Design Form Description display, type 3 in the *Opt* prompt, the starting column number in the *Column* prompt, the width of the field in print positions in the *Width* prompt, and 10 or 15 in the *Parm 1* prompt.
5. To exit from the Design Form Description display and to save the form description, press F3.

## Overlapping Fields

If you want fields to overlap, set your form description at 15 characters per inch and specify a field to print at 10 characters per inch.

To avoid overprinting, remember that a character at 10 characters per inch is 1-1/2 times as wide as a character at 15 characters per inch. Design your form description accordingly.

---

## Highlighting a Field

To highlight a field on a form description:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Form Description display.
3. Type the file name, the library name, and the form description name on which you want to highlight a field, and press Enter.
4. Type 4 in the *Opt* prompt, the starting column number in the *Column* prompt, and the width of the field in print positions in the *Width* prompt on the bottom part of the Design Form Description display.
5. To exit from the Design Form Description display and to save the form description, press F3.

---

## Underlining a Field

To underline a field on a form description:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Form Description display.
3. Type the file name, the library name, and the form description on which you want to underline a field, and press Enter.
4. Type 5 in the *Opt* prompt, the starting column number in the *Column* prompt, and the width of the field in print positions in the *Width* prompt, and ALL or NONBLANK in the *Parm 1* prompt on the bottom part of the Design Form Description display.
5. To exit from and save the form description, press F3.

---

## Bar Chart

A bar chart is a series of vertical or horizontal bars that represents data. Bar chart symbols are defined internally and are not part of a symbol set. The bar chart feature is similar to the symbol set feature. Both features require symbol IDs.

### Marking the Horizontal or Vertical Axis of a Bar Chart

You can use box characters to mark the horizontal or vertical axis of a bar chart. Each bar chart requires a symbol ID. A bar chart symbol ID identifies the type of bar chart on a form description. The following table shows the symbol ID's that can be used to identify a bar chart and describes the symbol that is substituted for each symbol ID:

---

Symbol ID	Symbol ID Description
1	Replaces the symbol ID with a box that darkens the entire print position
2	Replaces the symbol ID with half a box that darkens only the bottom half of a print position
3	Replaces the symbol ID with a box that contains an X
4	Replaces the symbol ID with half a box that contains half an X
5	Replaces the symbol ID with a hollow box
6	Replaces the symbol ID with half a hollow box

---

You can insert the bar chart symbol ID as a constant field in a form description or in a spooled file to be merged with a form description. APF ensures that the correct symbol appears on the printed form.

If you want to plot each print line as two units, use symbols 2, 4, and 6. If you select the EXTEND option and specify half symbols (2, 4, or 6) at the top of a bar, the remaining portion of the bar chart is filled with a whole symbol (1, 3, or 5).

When you define the region in which your bar chart is to appear, the region is scanned for bar chart symbol IDs. Scanning starts in the first column in the bar chart region. Scanning is column by column, from left to right, until the entire region is completed. The characters you provide to mark the horizontal axis establish the bottom of a bar chart. If you do not provide a horizontal axis, the scan is to the bottom of the form for bar chart symbols.

## Adding a Bar Chart to a Form Description

To add a bar chart to a form description:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Form Description display.
3. Type the file name, the library name, and the form description name to which you want to add the bar chart, and press Enter.
4. Type 6 in the *Opt* prompt, the starting column number of the bar chart in the *Column* prompt, the width of the bar chart in print positions in the *Width* prompt, and SINGLE or EXTEND in the *Parm 1* prompt on the bottom part of the Design Form Description display.

The SINGLE option performs a one-to-one replacement of bar chart symbol IDs with bar chart dot patterns. This is the default value.

The EXTEND option scans down a column until a bar chart symbol ID is found. This bar chart symbol ID is replaced with the corresponding dot pattern and moves down to the next line in the column. If the character in this position is a blank, the same dot pattern used before is substituted. If the character is the ID for a different bar chart symbol, the dot pattern for that symbol is used. If any other characters are encountered, the scan continues on to the next column and starts the procedure again.

5. To exit from the Design Form Description display and to save the form description, press F3.

---

## Creating a Box on a Form Description

You can use boxes to lay out the columns on a form description. To draw a box on a form description:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Form Description display.
3. Type the file name, the library name, and the form description name on which you want to draw the box, and press Enter.
4. Press F9 (Box characters) from the Design Form Description display.
5. Type three different nonblank characters in the *Character for corners and intersections* prompt, the *Character for horizontal lines* prompt, and the *Character for vertical lines* prompt on the Define Box Characters display.

APF substitutes the following characters to identify lines, corners, and intersections in boxes:

- † (hexadecimal 4E) for all corners and line intersections
- – (hexadecimal 60) for all horizontal lines
- | (hexadecimal 4F) for all vertical lines

6. Type Y or N in the *Scan for box characters* prompt on the Define Box Characters display, and press Enter.

If you type Y in the *Scan for box characters* prompt, the data for box characters is scanned. If you type N in the *Scan for box characters* prompt, box characters are not scanned. The default setting for the *Scan for box characters* prompt is N. To improve performance, specify N in the *Scan for box characters* prompt.

7. Type the nonblank box characters that you defined on the Define Box Characters display on the form description. For example, if you specify an a as the nonblank character for corners and intersections, b as the nonblank character for horizontal lines, and c as the nonblank character for vertical lines, you can type the following nine types of corners:

1	2	3	4	5	6	7	8	9
ab	bab	ba	c	c	c	c	c	c
c	c	c	ab	bab	ba	ab	bab	ba
			c	c	c			

For the nonblank characters that you specify for the corners, and vertical and horizontal lines, lines are substituted.

8. To exit from the Design Form Description display and to save the form description, press F3.

---

## Copying a Form Description

To copy a form description:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 3 (Copy) from the Work with Form Description display.
3. Type the file name, the library name, and the form description name you want to copy, and press Enter.
4. Rename the form description in the *To form description* prompt, and press Enter. You can also change the information in the *To file* prompt, the *To library* prompt, the *Characters per inch* prompt, the *Lines per inch* prompt, the *Page width* prompt, the *Page length* prompt, and the *Text* prompt.

The Work with Form Description display is shown. From this display, you can create another form description, copy, change, delete, or print a form description.

---

## Changing a Form Description

To change a form description:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Form Description display.
3. Type the file name, the library name, and the form description name you want to change, and press Enter.
4. Specify the fields you want to use as constants in the top part of the Design Form Description display.
5. Change the special features you want in the prompts in the bottom part of the Design Form Description display, and press Enter.
6. To exit from the Design Form Description display and save the form description, press F3.

The Work with Form Description display is shown. From this display, you can create another form description, copy, change, delete, or print a form description.

---

## Specifying Constant Fields

To specify the fields you want to appear on each form:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Form Description display.
3. Specify the fields you want to use as constants in the top part of the Design Form Description display, and press Enter.
4. To exit from the Design Form Description display and to save the form description, press F3.

The Work with Form Description display is shown. From this display, you can create another form description, copy, change, delete, or print a form description.

**Note:** Column numbers across the top of the display correspond to the column number on the form. Line numbers down the left side of the display correspond to the lines on the page.

---

## Viewing a List of Form Descriptions

To display a list of form descriptions:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Type the form description file name and the library name.
3. Position the cursor in the *Form description* prompt.
4. Press F4.

When viewing a list of form descriptions, you can also change, delete, or print a form description from this display.

## Viewing a Large Form

To move the display in all directions to examine each part of a large form:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 2 (Change) from the Work with Form Description display.
3. Type the file name, the library name, and the form description name, and press Enter.
4. Position the cursor in the *Control* prompt.
5. Select one of the following options to scroll through the display, and press Enter:

Option	Meaning
W or w	Displays data six columns to the right
W-	Displays data six columns to the left
W+n	Displays data that begins <i>n</i> characters to the right
W-n	Displays data that begins <i>n</i> characters to the left
Wn	Displays data beginning in position <i>n</i>
+n	Displays data that is <i>n</i> rows beyond the first row shown
-n	Displays data that is <i>n</i> rows before the first row shown
<i>n</i>	Displays row <i>n</i> as the first row on the display
T	Displays data at the top of the file
B	Displays data at the bottom of the file
Page Down	Moves the display up 9 lines from the top line. If the cursor is on one of the three lines used to define features and a plus sign (+) appears in the lower right portion of the display, the features roll up 2 lines. If the cursor is on the last line of the display, the messages roll. If the cursor is elsewhere on the display, the form layout rolls.
Page Up	Moves the display down 9 lines from the top row. If the cursor is on one of the three lines used to define features, the features roll down 2 lines. If the cursor is on the last line of the display, the messages roll. If the cursor is elsewhere on the display, the form layout rolls.

**Note:** APF does not automatically clear the *Control* prompt when you press Enter.

6. To exit from the Design Form Description display, press F3.

---

## Deleting a Form Description

To delete a form description:

1. Select option 2 (Work with form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Select option 4 (Delete) from the Work with Form Description display.
3. Type the file name, the library name and the form description name you want to delete, and press Enter.

The *Option* prompt on the Work with Form Description display remains blank to confirm that the form description is deleted.

---

## Printing a Blank Form

To print a blank copy of your form description immediately or to print a blank copy of your form in batch:

1. Select option 3 (Print blank form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Type the file name, the library name, and the form description name you want to print, and press Enter.
3. Specify the printer name and the number of copies on page 1 of the Print Options display.
4. To select less frequently used parameters, press Page Down.
5. Either type \*NO in the *Spool the data* prompt to print the form immediately, or type \*YES in the *Spool the data* prompt to send the form to the output queue to be printed later.

If you specify \*NO, a message at the bottom of the display confirms that the form is printing. If you specify \*YES, a message at the bottom of the display confirms that the form is in the output queue.

6. Type in any other parameters on the display, and press Enter.

## Printing a Filled Form

To merge a spooled file with a form and print it immediately or send it to the output queue to be printed later:

1. Select option 4 (Merge spooled data with a form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Type the file name, the library name, and the form description name you want to merge on the Merge Spooled Data with a Form Description display.
3. Verify that the layout of the data matches the layout of the form description, and press Enter.
4. Type the values you want for the prompts on page 1 of the Print Options display.
5. Press Page Down.

6. Type the values you want for the prompts on page 2 of the Print Options display.
7. Either type \*N0 in the *Spool the data prompt* to print the form immediately, or type \*YES to send the form to the output queue, and press Enter.

If you specify \*N0, a message at the bottom of the display confirms that the form is printing. If you specify \*YES, a message at the bottom of the display confirms that the form is in the output queue.

---

## Aligning Data on a Form Description

So that your data prints in the correct position, you must ensure that the advanced printer function (APF) calculates the new scale based on the original scale of the column numbers. Use the following algorithms to adjust the scale of column numbers:

- If your form description is at 10 characters per inch and your field is at 15 characters per inch, use the following to calculate the new scale:

Mapped column = (Column specified at 10 cpi \* 3) / 2

The result is then truncated to the nearest integer, for example:

Column 2 specified at 10 cpi = (2 \* 3) / 2 = 3 at 15 cpi

- If your form description is at 15 characters per inch and your field is at 10 characters per inch, the algorithm is a bit more complicated, but avoids a result of 0:

Mapped column = (([Column specified at 15] - 1) \* 2) / 3 + 1

The result is truncated to the nearest integer, for example:

Column 2 specified at 15 cpi = [(2 - 1) / 3] + 1 = 1 at 10 cpi

Column numbers do not line up between 10 characters per inch and 15 characters per inch. For example, column 30 at 15 characters per inch is 2 inches from the left edge of the form; column 20 at 10 characters per inch is 2 inches from the left edge of the form.

If you create a form description specifying 10 characters per inch on the Create Form Description display, then specify a field to print at 15 characters per inch beginning in column 20, the column number you specify is the column that relates to 10 characters per inch. APF must adjust the scale of this column to 15 characters per inch.

The column numbers that apply to the characters per inch setting you specify for your form description are displayed along the top of the Design Form Description display.

For some situations, you may not find a corresponding column number. For example, column 2 at 15 characters per inch is column 1-1/3 at 10 characters per inch, but the printer cannot move fractions of a column.



---

## Chapter 5. Creating a Spooled File

A spooled file is a form description created with APF that you merge with another form description containing constant data. You can also create a spooled file with an application program or with an AS/400 utility.

When you create a form description and a symbol set, you need to create a spooled file that you can merge with the form description containing constant data. Make sure that the spooled data is positioned correctly on the page. You can use data description specifications to ensure that the data is correctly positioned.

---

### Viewing a List of Form Descriptions to Merge

You can display a list of form descriptions and select one of the form description files to merge. To view a list of form descriptions and select one to merge:

1. Select option 4 (Merge spooled data with a form description) from the Advanced Printer Function (APF) display, and press Enter.
2. Type the name of an existing form file and the library name on the Merge Spooled Data with a Form Description display.
3. Position the cursor at the *Form description* prompt.
4. Press F4.

A list of form descriptions is displayed. You can select a form description to merge with a spooled file from this display.

---

### Merging a Spooled File

To merge a spooled file:

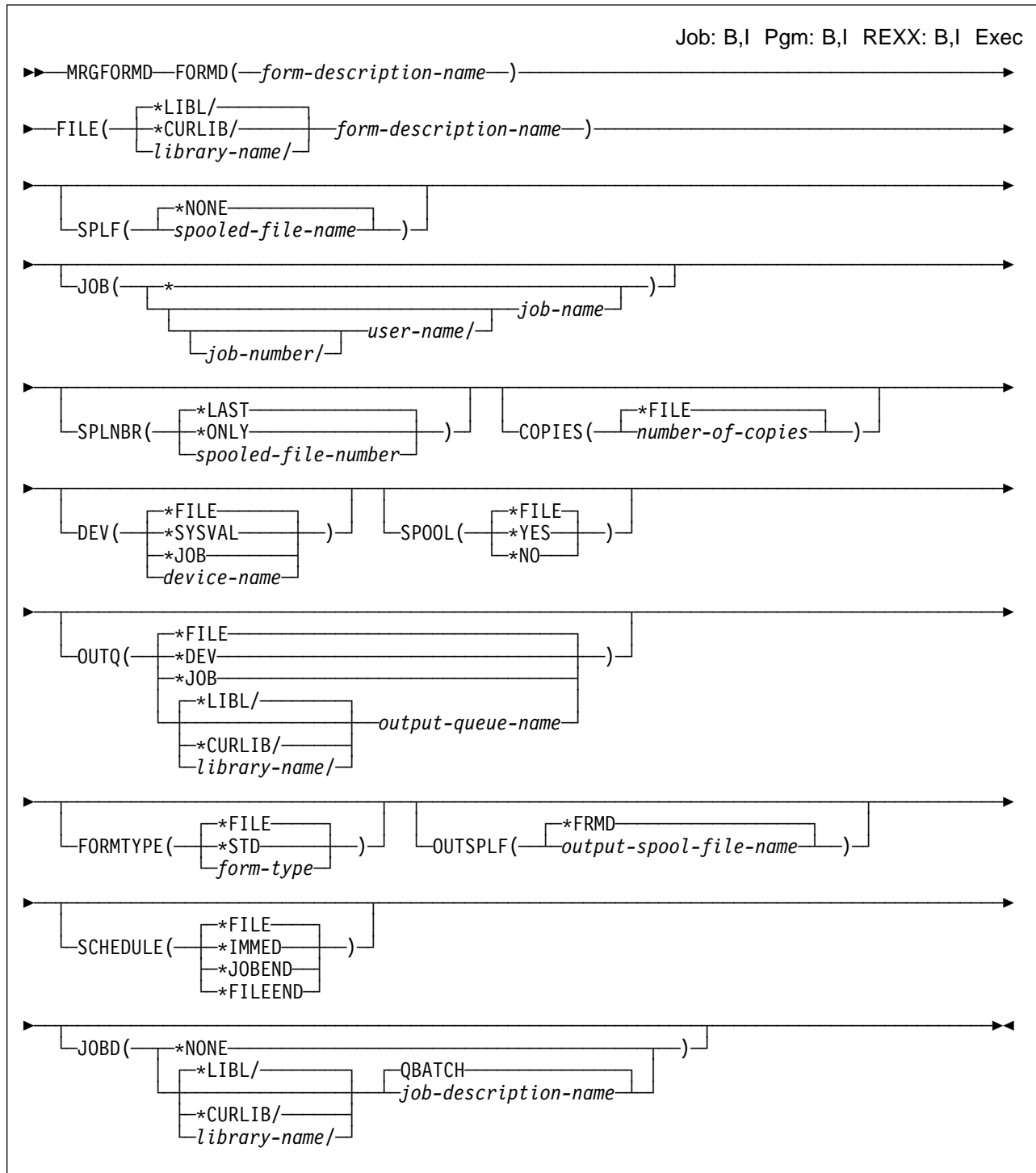
1. Select option 4 (Merge spooled data with a form description) from the Advanced Printer Function (APF) display, and press Enter.  
**Note:** You are actually merging data with a form description you already created.
2. Type the form file name, the library name, and the form description name on the Merge Spooled Data with a File display, and press Enter.
3. Type \*NONE or a name for the spooled file in the *Spooled file*.
4. Type the job name of the spooled file you want to merge with the form description or type \* in the *Job* prompt to specify the current job.
5. Type \*LAST or \*ONLY or a number for the spooled file in the *Spooled file number* prompt.
6. Press PageDown to access page 2 of the Print Options display.
7. If you want to print the spooled file immediately, type \*NO in the *Spooled* prompt. If you want to send the spooled file to the output queue and print it later, type \*YES in the *Spooled* prompt

If you specify \*NO, a message at the bottom of the display confirms that the spooled file is printing. If you specify \*YES, a message at the bottom of the display confirms that the spooled file is in the output queue.

## Merge Form Description (MRGFORMD) Command

The Merge Form Description (MRGFORMD) command merges a spooled output data file with a database file containing a form description. You can spool the data file for later printing, or direct it to a printer immediately.

### Command Syntax



**Note:** Online help information is available to help you interpret the syntax diagram.

**FORMD:** Specifies the name of the form description used to print a form or used in the merge operation.

*form-description-name:* Specifies the name of the file that contains the form description.

**FILE:** Specifies the qualified name of the file that contains the form description.

The possible library name values are:

**\*LIBL:** The library list is used to locate the file.

**\*CURLIB:** The current library for the job is used to locate the file. If no library is specified as the current library for the job, the QGPL library is used.

*library-name:* Specifies the name of the library where the file is located.

*form-description-name:* Specifies the name of the file that contains the form description.

**SPLF:** Specifies the name of the spooled output file that contains the data to be merged with the form description.

**\*NONE:** No spooled output file is specified.

*spooled-file-name:* Specifies the name of the spooled output file that contains the data to be merged with the form description.

**JOB:** Specifies the name of the job that contains the spooled output file to be merged with the form description. If no job name is provided, all jobs in the system are searched for the simple job name.

A job identifier is a special value or a qualified name with up to three elements, for example:

```
*
job-name
user-name/job-name
job-number/user-name/job-name
```

\*N may be used in place of an element that follows the values being specified to maintain the position in the parameter value sequence. For example, 123456/\*N/\*N specifies just the job number 123456, regardless of the job and user names. Without the \*N's strings, 123456 would have been interpreted as the job name, not the job number.

For an expanded description of this parameter and duplicate job names, refer to "Expanding the Size of a Symbol" on page 9.

**\*:** Specifies that the current job contains the spooled file.

*job-name:* Specifies the name of the job that created the spooled file to be merged.

*user-name:* Specifies the name of the user of the job that created the spooled file to be merged.

*job-number:* Specifies the number of the job that created the spooled file to be merged.

**SPLNBR:** Specifies the number of the spooled output file to be merged with the form description.

**\*LAST:** The last spooled file with the specified name is merged with the forms description.

**\*ONLY:** Only one spooled file has the name specified in the SPLF parameter.

*spooled-file-number:* Specifies the number of the spooled output file to be merged with the form description.

**COPIES:** Specifies the number of copies of the merged spooled output file that are printed.

**\*FILE:** The number of copies to print is taken from the COPIES value specified for the printer device file (QPAPFPRT).

*number-of-copies:* Specifies the number of copies of the merged spooled output file to be printed.

## MRGFORMD

**DEV:** Specifies the name of the printer device used to print the form or merged output.

**\*FILE:** The printer device is the same as that specified in the DEV parameter in the printer device file (QPAPFPRT).

**\*SYSVAL:** The printer device is specified through system value QSYSPRT.

**\*JOB:** The printer device is specified through the job's device file.

*device-name:* Specifies the name of the printer device to be used to print the form or merged output when the output is not spooled.

**SPOOL:** Specifies whether the data is spooled.

**\*FILE:** The spooled file attribute is the same as that used in the printer device file (QPAPFPRT).

**\*YES:** The data is spooled.

**\*NO:** The data is not spooled.

## OUTQ

**\*FILE:** The output queue name is the same as that specified in the printer device file (QPAPFPRT).

**\*DEV:** The default output queue value associated with the printer specified on the DEV parameter is used.

**\*JOB:** The output queue specified in the job description associated with the job for the spooled output is used.

The possible library name values are:

**\*LIBL:** The library list is used to locate the output queue.

**\*CURLIB:** The current library for the job is used to locate the output queue. If no library is specified as the current library for the job, the QGPL library is used.

*library-name:* Specifies the name of the library where the output queue is located.

*output-queue-name:* Specifies the name of the output queue that contains the spooled database output file.

## FORMTYPE

**\*FILE:** The merged spooled output file is printed on the form type specified in the printer device file QPAPFPRT.

**\*STD:** The merged spooled output file is printed on the standard form type used at your installation.

*form-type:* Specifies the name of the form type on which the spooled output file is printed.

**OUTSPLF:** Specifies the name of the merged spooled output file on the output queue.

**\*FRMD:** The forms description name is used as the name of the merged spooled output file on the output queue.

*output-spool-file-name:* Specifies the name (up to 10 characters) of the merged spooled output file on the output queue.

**SCHEDULE:** Specifies when the merged spooled output file is available to a spool writer.

**\*FILE:** The merged spooled output file is available to a spool writer as specified in the SCHEDULE parameter in the printer device file (QPAPFPRT).

**\*IMMED:** The merged spooled output file is available to a spool writer immediately.

**\*JOBEND:** The merged spooled output file is available to a spool writer when the current job finishes.

**\*FILEEND:** The merged spooled output file is available to a spool writer when the end of the current file is reached.

## JOB

**\*NONE:** The printing is done under the current job description.

The possible library name values are:

**\*LIBL:** The library list is used to locate the job description.

**\*CURLIB:** The current library for the job is used to locate the job description. If no library is specified as the current library for the job, the QGPL library is used.

*library-name*: Specifies the name of the library that contains the job description.

**\*QBATCH**: The job description is submitted by \*QBATCH.

*job-description-name*: Specifies the name of the job description used to submit the job.

## Example

```
MRGFORMD  FORMD(MLOGO)  FILE(DSNFILE3/BILL)
          SPLF(QSYSPRT)  SPOOL(*NO)  DEV(WSPR01)
```

This command merges a form description named MLOGO in file DSNFILE3 in library BILL with the last spooled file named QSYSPRT from the current job. There is only one copy; it is not spooled, but is printed immediately on printer WSPR01.

---

## Batch Job Prerequisites

A batch job is a predefined group of processing actions that are performed by the system with little or no interaction between you and the system. You can merge spooled files with a form description from a batch job. Use the Merge Form Description (MRGFORMD) command to merge spooled files with a form description.

Before you can merge a spooled file with a batch job, you must:

- Create the necessary symbol sets
- Create your form description
- Produce spooled output files

---

## Reducing Printing Time for Spooled Files

To reduce printing time when merging spooled files with a form description, use a large spooled file instead of several small spooled files. APF requires time to perform the following functions for the first page of data in each file:

- Open files
- Set variables
- Create work spaces

The amount of processing time is reduced for each subsequent page.

## Restrictions on Viewing Spooled Files

You cannot view a spooled file that is created using option 3 or option 4 from the Advanced Printer Function (APF) display or that is created using the Merge Form Description (MRGFORMD) command. APF cannot display the file because it contains special characters that are not supported on your workstation.



---

## Appendix A. Optical Character Recognition Font A Characters

The IBM\* Optical Character Recognition Font A (OCR-A) characters (1234567890ACDMNPRUXY\$.>/) are derived from the designs described in the USA SCS OCR standard of the American National Standards Institute (ANSI\*\*) organization. The IBM OCR-A characters are not identical to these standard characters. You must test both the 5224 and 5225 OCR printing and the OCR reader in the application to ensure that the codes can be read successfully.

---

### Loading IBM OCR-A Characters

To load one character set file in a form that contains the 24 one-by-one characters:

Type the letter O on any attribute line in the Advanced Printer Function (APF) display. Loading these character definitions improves formatting and printing performance. If two character-set files are provided, the letter O is not used.

**Notes:**

1. If any of the non-OCR-A characters are referred to in a character-set file containing more than 24 OCR-A characters, the OCR-A character set is destroyed and results occur that cannot be predicted.
2. You cannot use OCR-A characters and bar codes on the same form description.

---

### Changing OCR-A Character Examples

You can change the OCR-A National Retail Merchant Association (NRMA) Subset character examples like any other symbol and use them as a base to change OCR-A characters.

To increase the readability of the OCR-A NRMA Subset characters, reposition the vertical portion of the numeric 1 from the sixth column to the fifth. These characters print every other position, every other line, and at 15 characters per inch. Do not place a space before the decimal point before a number, for example, \$1 2.4 5.





---

## Appendix B. Example Scale and Layout Grids for Form Design

This appendix contains the following example grids for you to use when laying out logos or alternative characters:

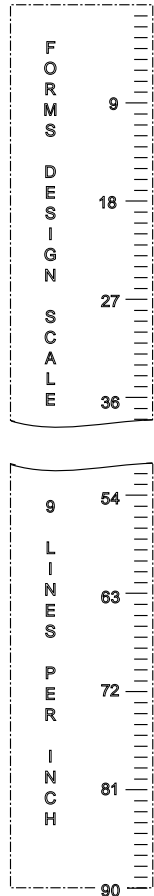
- 4-by-4 characters
- 9-by-9 characters
- 15-by-15 logos

The box above each layout grid illustrates the actual character or logo size when the character is printed. You can remove the grids from the book and make copies of them to help you when designing.

---

### Forms Design Cutout Scale

The following figure shows an example of a forms design cutout scale:

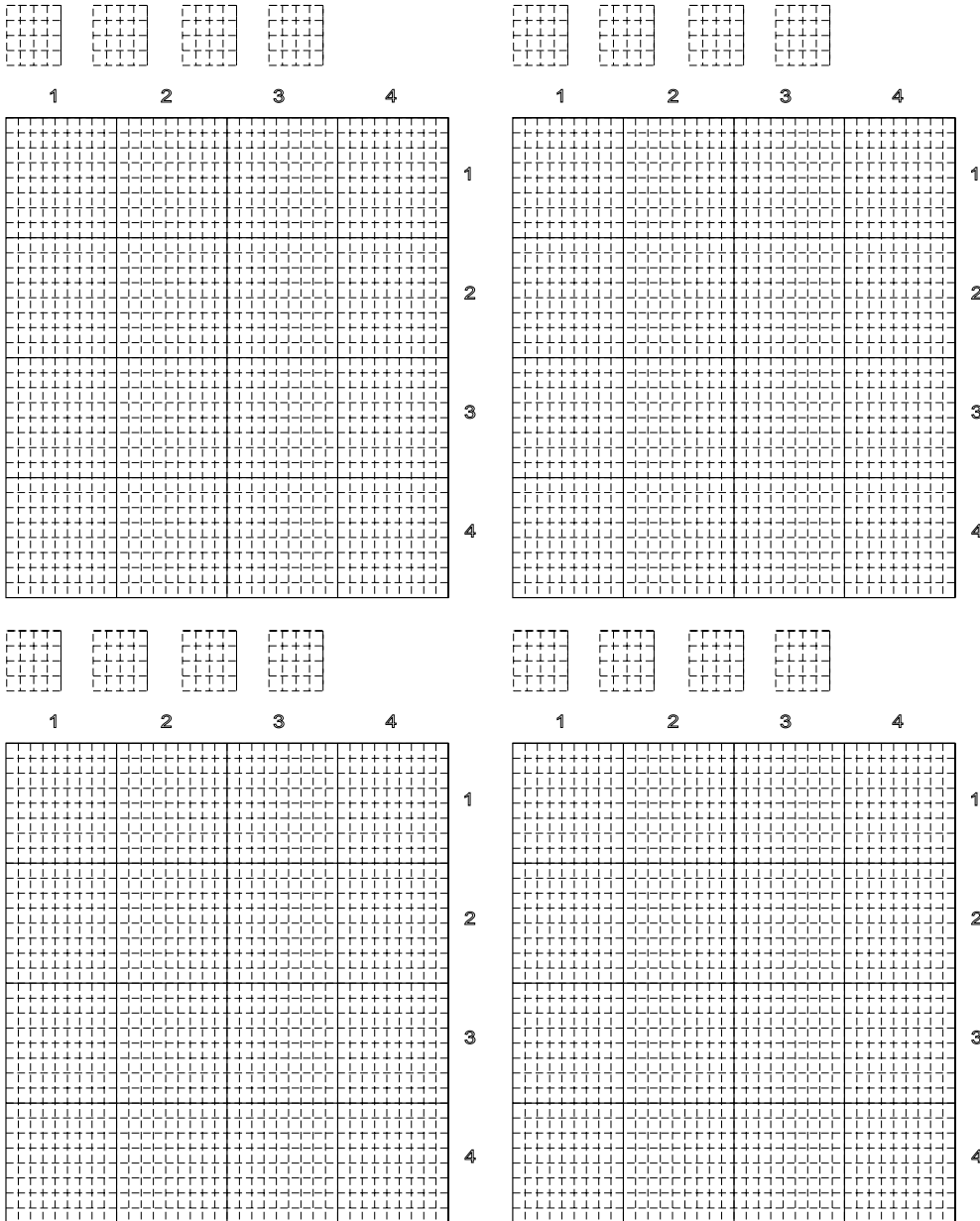


## 4-by-4 Layout Grid

The following figure shows an example of an alternative character set 4-by-4 layout grid:

### ACS Layout: 4x4

Characters available: ABCDEFGHIJKLMNOPQRSTUVWXYZ\_@#\$\$%^&\*()\_+!:"'?>.  
abcdefghijklmnopqrstuvwxyz`1234567890-=[\;{}/<,>

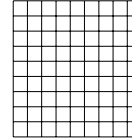


## 9-by-9 Layout Grid

The following figure shows an example of an alternative character set 9-by-9 layout grid:

### ACS Layout: 9x9

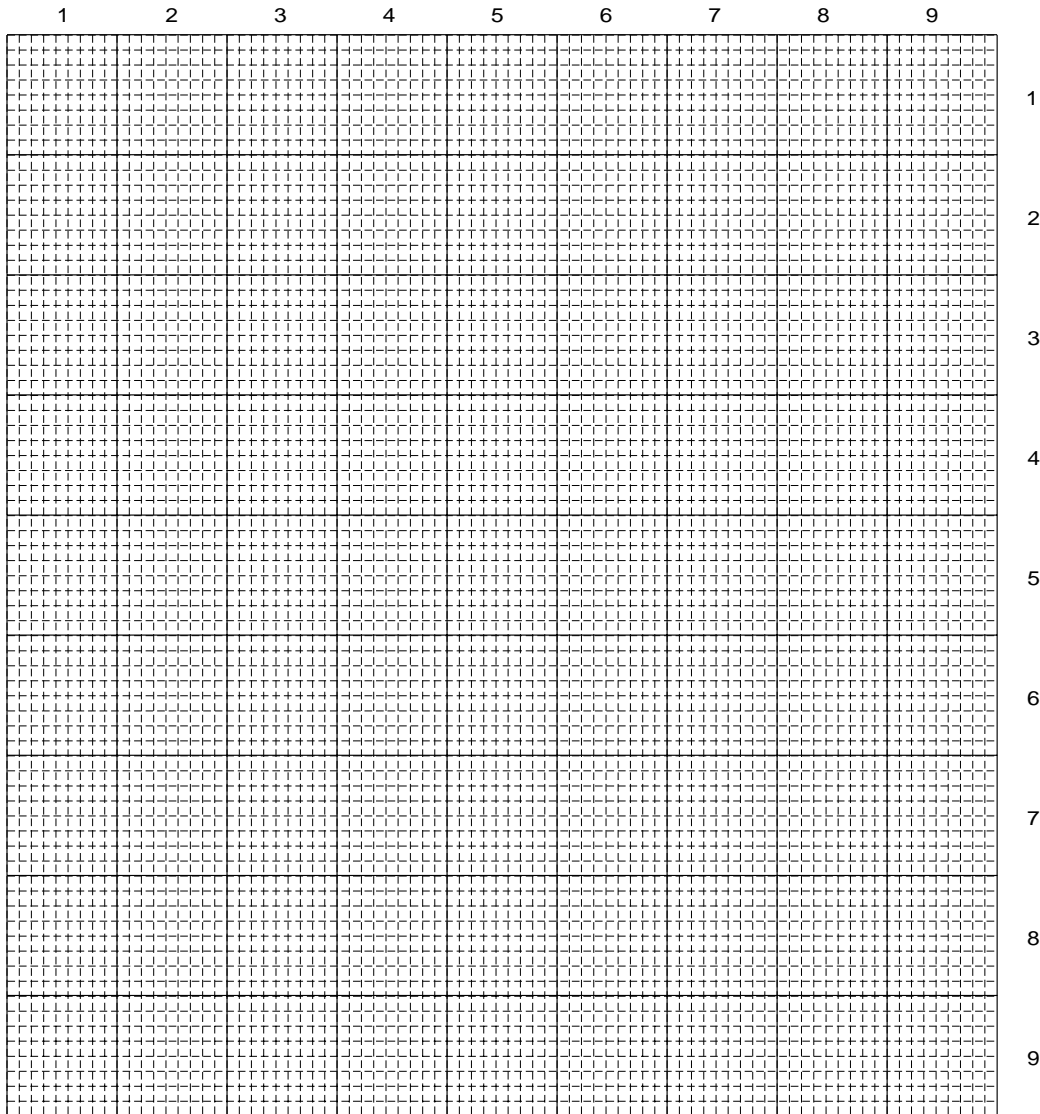
actual size:



Characters available:

ABCDEFGHIJKLMNOPQRSTUVWXYZ`|@#%&^\*()\_+!:"'?>.

abcdefghijklmnopqrstuvwxyz`1234567890-=[\;'/<,>

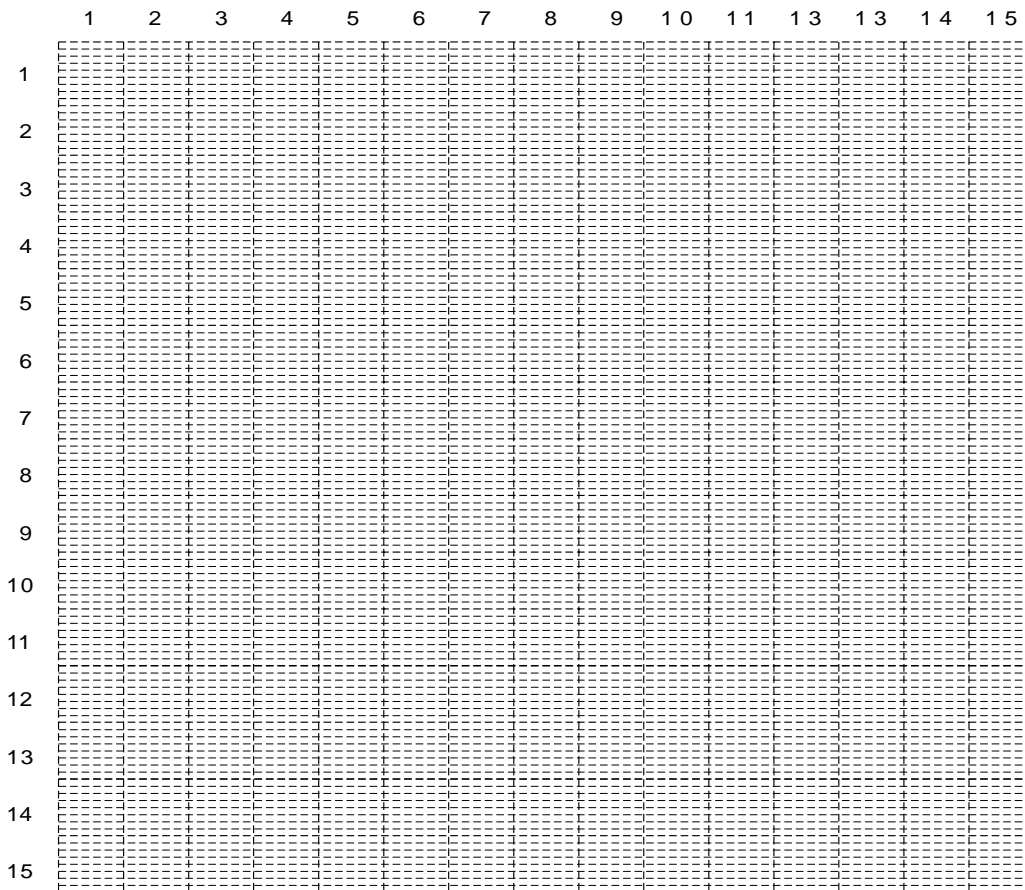
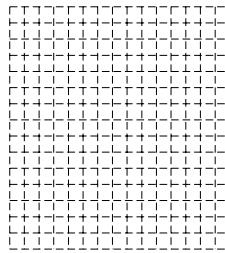


# 15-by-15 Logo Layout Grid

The following figure shows an example of a 15-by-15 logo layout grid:

## Logo Layout: 15x15

actual size:



HRSLF031-0

---

## Appendix C. Advanced Printer Function on the AS/400 System and System/36

This appendix describes the differences between APF on the AS/400 system and System/36. This appendix defines these differences as:

- Functional differences
- Command differences

---

### Functional Differences

Following is an explanation of the functional differences when using APF on the AS/400 system.

#### Logos

On System/36, logos are supported differently than alternative character sets. On the AS/400 system, logos and alternative character sets are both supported as symbol sets.

#### Alternative Character Sets

On System/36, alternative character or symbol definitions allow 48 or 96 characters in a character set. On the AS/400 system, for 1-byte codes, the maximum number of symbols in a symbol set is limited to the number of different characters you can type on your keyboard. With 2-byte codes, the number is greatly increased.

On System/36, symbol definitions may contain standard characters. This function is not supported on AS/400 APF. When System/36 symbol definitions containing standard characters are migrated to the AS/400 system using the migration aid, any standard characters in these symbol definitions are dropped. On the AS/400 system, you must change your form description or application data generates the spooled print data to include the standard characters that were a part of the System/36 symbol definition.

On System/36, an alternative character set file contains only one alternative character set. On the AS/400 system, each alternative character set is a member of a file. Because files on the AS/400 system may contain multiple members, a symbol set file may contain multiple symbol set (members). Each symbol set can contain multiple character definitions.

#### Forms Control Files

On System/36, up to two alternative character sets are allowed for a forms description. Only the positions (row and column) of the alternative character sets are specified in the forms control file. The names of the alternative character sets used by the forms control file is not specified until the merge form and data step is done.

On the AS/400 system, up to 20 symbol sets may be used for a forms description. The name or names of the alternative character sets used by the forms description must be specified when the form description is created. When System/36 forms control files containing alternative character sets are migrated to the AS/400 system using the migration aid, a default character set name of CHARSET1 or CHARSET2 is generated for the first and second alternative character sets used in the forms control file.

On the AS/400 system, you must change your form description to specify the correct symbol set file (replace CHARSET1 or CHARSET2 with (PARM1), file (PARM2), and library (PARM3) of symbol set). When converting System/36 APF files, the migration utility creates a file with the same name as existed on System/36. The member name will be the same as the file name. The library name should be the library name specified when using the System/36 migration aid to migrate the APF files.

On System/36, up to four logos are allowed for a forms description. Only the position (row and column) of the logos are specified in the forms control file. The name of the logos used by the forms control file is not specified until the merge form and data step is done.

On the AS/400 system, up to 20 symbol sets (logos or alternative character sets) may be used by the forms description. The name of the logos used by the forms description must be specified when the form description is created. When System/36 forms control files containing logos are migrated to the AS/400 system using the migration aid, a default logo name of LOGO1, LOGO2, LOGO3 or LOGO4 is generated for the logos used in the forms control file.

On the AS/400 system, you must change your form description to specify the correct logos (for example, replace LOGO1 with member (PARM1), file (PARM2), and library (PARM3) of logo). When converting System/36 APF files, the migration utility creates a file with the same name as existed on System/36. The member name will be the same as the file name. The library name should be the library name when using the System/36 migration aid to migrate the APF files.

---

## Command Differences

The following lists System/36 procedures and equivalent AS/400 commands used by APF:

<b>System/36 Procedures</b>	<b>AS/400 Commands</b>
APF	STRAPF
APFA	STRAPF
APFF	STRAPF
APFL	STRAPF
APFM	MARGFORMD

---

## Bibliography

The following publications are listed with their full titles and base order numbers.

The related Application Development ToolSet/400 publications are:

- *ADTS/400: Character Generator Utility*, SC09-1769
- *ADTS/400: Data File Utility*, SC09-1773
- *ADTS/400: Compare and Merge*, SC09-1772
- *ADTS/400: Interactive Source Debugger*, GC09-1897
- *ADTS/400: Programming Development Manager*, SC09-1771
- *ADTS/400: Report Layout Utility*, SC09-1767
- *ADTS/400: Screen Design Aid*, SC09-1768
- *ADTS/400: Screen Design Aid for the System/36 Environment*, SC09-1893
- *ADTS/400: Source Entry Utility*, SC09-1774
- *Introducing Application Development ToolSet/400 and the AS/400 Server Access Programs*, SC09-1939

The orderable features of 5763-PW1 are:

- *Application Development Tools: Application Development Manager Introduction and Planning Guide*, GC09-1807
- *Application Development Tools: Application Development Manager User's Guide*, SC09-1808
- *ADTS/400: Application Dictionary Services/400 Self-Study*, SC09-1904
- *ADTS/400: Application Dictionary Services User's Guide*, GC09-1860

The related IBM AS/400 publications are:

- *CL Reference*, SC41-3722
- *DDS Reference*, SC41-3712
- *Publications Reference*, SC41-3003

The related System/36 publications are:

- *IBM 5224 Printer Models 1 and 2 Operator's Guide*, GA34-0092
- *IBM 5225 Printer Models 1, 2, 3 and 4 Operator's Guide*, GA34-0054





---

# Index

## A

**Add Logical File (ADDLFM) command** 3

**ADDLFM command** 3

**ADDPFM command** 3, 13

**Advanced Printer Function (APF)**

authorization required 1

definition 1

functions 1

starting 1

**aligning data in a form description** 24

**APF**

See Advanced Printer Function (APF)

**Application System/400 (AS/400) system**

alternative character sets 37

logos 37

**authorization required**

creating

logical file 3

physical file 3

deleting

symbol 12

symbol set 5

## B

**bar chart**

adding to a form description 19

definition 18

options 19

parameters 13

**bar code** 15, 16

**batch processing** 29

**box**

characters 20

lines 20

parameters required 13

performance tip 20

uses 19

## C

**Change Printer File (CHPRTF) command** 12

**characters per inch (CPI)** 13

**CHGPRTF command** 12

**constant data** 21

**copying**

form description 20

symbol 9

symbol set 4

**Create Physical File (CRTPF) command** 3

**creating**

bar chart 19

**creating** (*continued*)

bar code 15

box 19

form description 13

logical file 3

physical file 3, 13

spooled file 25

symbol 9

symbol set 4

**CRTFP command** 13

**CRTLF command** 3

**CRTPF command** 3

## D

**deleting**

form description 23

symbol 12

symbol set 5

**differences between AS/400 system and System 36**

command 38

function 37

**Display File Description (DSPFD) command** 3

**displaying**

large form 22

large symbol 11

**dot matrix printer**

definition 1

restrictions 2

**drawing**

box 19

symbol 9

**DSPFD command** 3

## E

**European Article Number (EAN) 13 digit** 15

**European Article Number (EAN) 8 digit** 15

**example**

1–10 byte symbol ID 8

2-byte symbol ID 8

merging a spooled file 29

OCR-A characters 31

symbol 7

**expanding symbol size** 9

**extending a symbol** 10

## F

**field length**

10 characters per inch 17

15 characters per inch 17

## **form description**

- adding symbol set 14
- changing 21
- copying 20
- creating 13
- deleting 23
- field
  - 10 characters per inch 17
  - 15 characters per inch 17
  - highlighted 17
  - overlapped 17
  - underlined 18
- functions 13
- printing
  - blank copy 23
  - filled-out copy 23
- specifying constant data 21
- viewing a list 21
- viewing a list to merge 25

## **form design**

- cutout scale 33
- layout grids 33

## **H**

### **highlighting**

- field on a form description 17
- parameters required 13

## **I**

### **IBM OCR-A characters 31**

## **L**

### **layout grid**

- 15-by-15 36
- 4-by-4 34
- 9-by-9 35

### **lines for a box 20**

### **loading OCR-A characters 31**

## **M**

### **Merge Form Description (MRGFORMD) command 2**

#### **merging a spooled file**

- batch processing 29
- example 29

### **migrating from System/36 38**

### **migration aid 38**

### **MRGFORMD command 2, 26**

## **O**

### **1–10 byte symbol ID 8**

### **Optical Character Recognition Font A (OCR-A) 31**

### **optical scanning device 15**

### **overlapping fields 17**

### **Override with Printer File (OVRPRTF) command 12**

### **OVRPRTF command 12**

## **P**

### **performance tips**

- aligning data in a form description 24
- bar chart 18
- box 20
- correct-character-per-inch setting 19
- designing a form description 17
- OCR-A characters 31
- printing
  - spooled file 29
  - symbol 12

### **positioning symbol IDs 8**

### **print head 1**

### **print position 1**

### **printed width of bar code**

- CODE 39 16
- PLESSEY 16

### **printer file**

- parameters 2
- QPAPFPRT 2

### **printing**

- blank copy of a form 23
- data in the correct position 24
- dense dot patterns 2
- filled-out copy of a form 23
- on another printer 2
- symbol 12
- symbol set 5

## **Q**

### **QPAPFPRT parameters 2**

## **R**

### **related printed information 39**

#### **required parameters**

- bar chart 13, 19
- box 13
- field
  - 10 characters per inch 13
  - 15 characters per inch 13
  - highlighted 13
  - underlined 13
- merging spooled file 26
- symbol set 13

#### **restrictions**

- creating
  - logical file 3
  - physical file 3

**restrictions** *(continued)*

- deleting
  - symbol 12
  - symbol set 5
- dot matrix printers 2
- OCR-A characters 31
- printing 2
- symbol ID 8
- viewing spooled file 29

**S****sample symbol set**

- QAAPF1X1 file 3
- QAAPF1X2 file 3
- QAAPF2X2 file 3

**scanning for symbol ID 8****special features**

- bar code 15
- box 19
- field
  - 10 characters per inch 17
  - 15 characters per inch 17
  - highlighted 17
  - underlined 18
- parameters required 13
- symbol set 3, 14

**specifying**

- constant data on a form description 21
- field length
  - 10 characters per inch 17
  - 15 characters per inch 17

**spooled file 25****Start Advanced Printer Function (STRAPF)****command 1****STRAPF command 1****symbol**

- copying 9
- creating 9
- definition 7
- deleting 12
- drawing 9
- enlarging 10
- example 7
- extending 10
- functions 7
- identification 7
- printing 12
- viewing a list 11

**symbol ID**

- 1–10 bytes 8
- 2-bytes 8
- definition 7
- positioning 8
- scanning for 8

**symbol set**

- copying 4
- creating 4
- definition 3
- deleting 5
- functions 3
- parameters required 13
- printing 5
- sample file
  - QAAPF1X1 3
  - QAAPF1X2 3
  - QAAPF2X2 3
- storing 3
- viewing a list 4

**System/36**

- alternative character sets 37
- logos 37

**T****testing OCR-A characters 31****2-byte symbol ID 8****U****underlining**

- field on a form description 18
- parameters required 13

**Universal Product Code (UPC) version A 15****Universal Product Code (UPC) version E 15****V****viewing**

- large form 22
- large symbol 11

**viewing a list**

- form description 21
- form description to merge 25
- symbol 11
- symbol set 4



Program Number: 5763-PW1



Printed in the United States of America  
on recycled paper containing 10%  
recovered post-consumer fiber.

SC09-1766-00

