Print Services Facility
Version 4, Release 6.0

# *AFP Conversion and Indexing Facility User's Guide*

S550-0436-05

**Note**

Before using this information and the product it supports, read the information in "Notices" on page 239.

This edition applies to AFP Conversion and Indexing Facility, which is included with Print Services Facility™ 4.6.0 for z/OS® (Program Number 5655-M32); Print Services Facility/VM 2.1.1 (Program Number 5684-141); and Print Services Facility/VSE 2.2.1 (Program Number 5686-040). This edition applies to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces S550-0436-04.

# Contents

**List of Figures................................................................................ xiii**

**List of Tables.......................................................................................xv**

**About this publication................................................................... xvii**

Who should read this publication......................................................xvii
How this publication is organized......................................................xvii
What terms are used in this publication.............................................. xviii
Understanding the notational conventions used in this publication.........xviii
Highlighting..........................................................................................xviii
Syntax notation...................................................................................... xix
Related information..............................................................................xix

**How to send your comments to IBM.............................................xxi**

If you have a technical problem............................................................xxi

**Summary of changes.....................................................................xxii**

**Chapter 1. Understanding ACIF.........................................................1**

Overview of ACIF.......................................................................................1
ACIF functions............................................................................................2
Converting data streams......................................................................... 2
Indexing documents..................................................................................4
Retrieving resources..................................................................................7
Scenarios for processing ACIF files..........................................................8
Preparing files for viewing.........................................................................8
Preparing files for printing..........................................................................9
Preparing files for archiving and retrieval...............................................10
IBM products used with ACIF..................................................................11
AFP Workbench Viewer...........................................................................11
AFP Toolbox............................................................................................12
Document Composition Facility (DCF)....................................................13
System considerations for ACIF.............................................................. 13
System limitations....................................................................................13
System prerequisites................................................................................ 13

**Chapter 2. Using ACIF......................................................................15**

Using ACIF in z/OS.................................................................................. 15
z/OS JCL statements for running ACIF.................................................. 15
Enabling ICONV translation services and regular expressions...............16
Using ACIF in VM.....................................................................................17
VM/CMS commands for running ACIF.................................................... 17
Using ACIF in VSE.................................................................................... 18
VSE JCL statements for running ACIF.....................................................18

**Chapter 3. ACIF parameters.............................................................21**

Syntax rules for ACIF.............................................................................. 21
Parameter values for ACIF.......................................................................22
CC.............................................................................................................31
CCTYPE.................................................................................................... 32
CHARS.......................................................................................................32
COLORMAP............................................................................................... 33
COMSETUP............................................................................................... 34
CPGID....................................................................................................... 35

DCFPAGENAMES........ 35
DUPLEX........ 35
EXTENSIONS........ 36
FDEFLIB........ 39
FIELDn........ 40
FONTECH........ 41
FONTLIB........ 41
FONTPATH........ 43
FORMDEF........ 43
GROUPNAME........ 45
IMAGEOUT........ 45
INDEXn........ 45
INDEXDD........ 46
INDEXOBJ........ 47
INDEXSTARTBY........ 48
INDXEXIT........ 48
INPEXIT........ 48
INPUTDD........ 48
INSERTIMM........ 49
LINEOFFSET........ 50
MCF2REF........ 50
MSGDD........ 51
OBJCONLIB........ 51
OBJCPATH........ 52
OUTEXIT........ 52
OUTPUTDD........ 52
OVLYLIB........ 53
PAGEDEF........ 54
PARMDD........ 56
PDEFLIB........ 56
PRMODE........ 57
PSEGLIB........ 57
RESEXIT........ 58
RESFILE........ 59
RESOBJDD........ 59
RESTYPE........ 60
TRACE........ 62
TRACEDD........ 63
TRC........ 63
TRIGGERn........ 63
UNIQUEBNGS........ 65
USERLIB........ 65
USERPATH........ 66

**Chapter 4. Enhanced indexing parameters........ 67**
Parameter values for enhanced indexing........ 67
BREAKYES........ 68
FIELDn........ 69
GROUPMAXPAGES........ 75
INDEXn........ 75
TRIGGERn........ 77
USERMASK........ 80

**Chapter 5. Examples of using ACIF........ 81**
Examples of using ACIF processing parameters........ 81
Transforming line data or XML data into a MO:DCA-P document........ 81
Retrieving resources........ 81

Specifying AFP coded fonts.......... 82
Specifying TrueType and OpenType fonts.......... 82
Identifying the location of resource libraries during processing.......... 83
Drawing graphics with record format page definitions.......... 83
Example of using ACIF to view and index documents.......... 84
Examining the input file.......... 85
Specifying ACIF processing parameters.......... 87
Indexing data in the input file.......... 90
Identifying the locations of the resources in a parameter file.......... 92
Determining the form definition and the page definition.......... 92
Running the ACIF job.......... 93
Concatenating ACIF output files.......... 93
Accessing the document file for viewing.......... 94
Example of using enhanced indexing with ACIF.......... 94
Enhanced indexing telephone bill.......... 94
Enhanced indexing parameter file.......... 95
Example of using ACIF with UTF-16 data.......... 97

**Chapter 6. User exits and input print file attributes.......... 99**
User programming exits.......... 99
Input record exit.......... 99
Index record exit.......... 101
Output record exit.......... 102
Resource exit.......... 103
User exit search order.......... 106
z/OS.......... 106
VM.......... 106
VSE.......... 106
Attributes of the input print file.......... 106

**Chapter 7. ACIF messages.......... 109**
Message identifiers.......... 109
Multiple message scenarios.......... 109
General messages.......... 110
APK104S.......... 110
APK105I.......... 110
APK106I.......... 110
APK108I.......... 111
APK109I.......... 111
APK110S.......... 111
APK112S.......... 112
APK113S.......... 112
APK114S.......... 113
APK116S.......... 113
APK117S.......... 113
APK118W.......... 114
APK120S.......... 114
APK130S.......... 115
APK135I.......... 115
APK138S.......... 115
APK139S.......... 116
APK140S.......... 116
APK141S.......... 116
APK143S.......... 117
APK145S.......... 117
APK146S.......... 117
APK147S.......... 118

APK152S ........ 118
APK154S ........ 118
APK155S ........ 119
APK156S ........ 119
APK157S ........ 120
APK158I ........ 120
APK159S ........ 120
APK162S ........ 121
APK163I ........ 121
APK166S ........ 121
APK167S ........ 122
APK169S ........ 122
APK170S ........ 122
APK171S ........ 123
APK172S ........ 123
APK178S ........ 123
APK179S ........ 124
APK181S ........ 124
APK190S ........ 125
APK191S ........ 125
APK210S ........ 125
APK212S ........ 126
APK217S ........ 126
APK221S ........ 126
APK223I ........ 126
APK244I ........ 127
APK245I ........ 127
APK250S ........ 128
APK251S ........ 128
APK253S ........ 128
APK254S ........ 129
APK258I ........ 129
APK259I ........ 129
APK261S ........ 130
APK262S ........ 130
APK263S ........ 130
APK264S ........ 131
APK267S ........ 131
APK268S ........ 132
APK269S ........ 132
APK270S ........ 132
APK271S ........ 133
APK272S ........ 133
APK273S ........ 133
APK274S ........ 134
APK275S ........ 134
APK278S ........ 134
APK289I ........ 135
APK290I ........ 135
APK291I ........ 135
APK299I ........ 136
APK300I ........ 136
APK301S ........ 136
APK307S ........ 137
APK309S ........ 137
APK310S ........ 138
APK312S ........ 138
APK314S ........ 138

APK315S ....................................139
APK316S ....................................139
APK317S ....................................139
APK319I ....................................140
APK320S ....................................140
APK321S ....................................140
APK322S ....................................141
APK323S ....................................141
APK324S ....................................141
APK326S ....................................142
APK327S ....................................142
APK329S ....................................143
APK330I ....................................143
APK334S ....................................144
APK335S ....................................144
APK337I ....................................144
APK339I ....................................145
APK340I ....................................145
APK342I ....................................146
APK343I ....................................146
APK344S ....................................146
APK346W ....................................147
APK350S ....................................147
APK353S ....................................148
APK356S ....................................148
APK359I ....................................148
APK364I ....................................149
APK366I ....................................149
APK367I ....................................149
APK368S ....................................150
APK369S ....................................150
APK380S ....................................151
APK381S ....................................151
APK384S ....................................151
APK385S ....................................152
APK386I ....................................152
APK387S ....................................153
APK388S ....................................153
APK389S ....................................153
APK390S ....................................154
APK392I ....................................154
APK395I ....................................154
APK396I ....................................155
APK397I ....................................155
APK398I ....................................155
APK400S ....................................156
APK401S ....................................156
APK402S ....................................156
APK403S ....................................156
APK404S ....................................157
APK405S ....................................157
APK406S ....................................157
APK407S ....................................157
APK408S ....................................157
APK409I ....................................157
APK410S ....................................158
APK411S ....................................158
APK412I ....................................158

APK413S ....... 159
APK414I ....... 159
APK415I ....... 159
APK417I ....... 159
APK418S ....... 160
APK419S ....... 160
APK420S ....... 160
APK421S ....... 160
APK422S ....... 161
APK423S ....... 161
APK424I ....... 162
APK425S ....... 162
APK426S ....... 162
APK427I ....... 162
APK428S ....... 163
APK431I ....... 163
APK432I ....... 163
APK435W ....... 163
APK436S ....... 163
APK437S ....... 164
APK438S ....... 164
APK440I ....... 164
APK441I ....... 164
APK442S ....... 164
APK443S ....... 165
APK444S ....... 165
APK445S ....... 165
APK446S ....... 165
APK447S ....... 165
APK448S ....... 166
APK449S ....... 166
APK450S ....... 166
APK451S ....... 166
APK452S ....... 167
APK453S ....... 167
APK454S ....... 167
APK455S ....... 167
APK456S ....... 167
APK457S ....... 168
APK458S ....... 168
APK459S ....... 168
APK460S ....... 168
APK461S ....... 168
APK462S ....... 168
APK463S ....... 169
APK464S ....... 169
APK465S ....... 169
APK466S ....... 169
APK467S ....... 169
APK468S ....... 169
APK469S ....... 170
APK470S ....... 170
APK471S ....... 170
APK472S ....... 170
APK473S ....... 170
APK474S ....... 171
APK475S ....... 171
APK476S ....... 171

APK478I ........ 171
APK479S ........ 172
APK484S ........ 173
APK485S ........ 173
APK486S ........ 173
APK487S ........ 173
APK488S ........ 174
APK489S ........ 174
APK490S ........ 174
APK491S ........ 174
APK492I ........ 175
APK494I ........ 175
APK498S ........ 175
APK499I ........ 176
APK532S ........ 176
APK900S ........ 176
APK901S ........ 177
APK902S ........ 177
APK903S ........ 177
APK904S ........ 177
APK905S ........ 177
APK906S ........ 177
APK907S ........ 178
APK908S ........ 178
APK909S ........ 178
APK910S ........ 178
APK911S ........ 178
APK912S ........ 178
APK913S ........ 179
APK914S ........ 179
APK915S ........ 179
APK916S ........ 179
APK917S ........ 179
APK918S ........ 180
APK919S ........ 180
APK921S ........ 180
APK2003S ........ 180
APK2004S ........ 181
APK2005S ........ 181
APK2007S ........ 181
APK2008I ........ 182
APK2010S ........ 182
APK2011I ........ 182
APK2012S ........ 183
APK2013S ........ 183
APK2014I ........ 183
APK2015S ........ 184
APK2016S ........ 184
APK2017S ........ 185
APK2018S ........ 185
APK2019I ........ 185
APK2020I ........ 186
APK2021I ........ 186
APK2022I ........ 186
APK2023I ........ 187
APK2024I ........ 187
APK2025I ........ 188
APK2026I ........ 188

APK2027I ........ 189
APK2029I ........ 189
APK2030I ........ 189
APK2033I ........ 190
APK2034S ........ 190
APK2035S ........ 190
APK2039I ........ 191
APK2040I ........ 191
APK2041I ........ 191
APK2042I ........ 191
APK2044I ........ 192
APK2045I ........ 192
APK2046I ........ 193
APK2047I ........ 193
APK2048I ........ 193
APK2049I ........ 193
APK2050I ........ 194
APK2051I ........ 194
APK2052I ........ 194
APK2053I ........ 195
APK2054I ........ 195
APK2055I ........ 195
APK2056I ........ 196
APK2057I ........ 196
APK2072I ........ 196
APK2073I ........ 197
APK2074I ........ 197
APK2075S ........ 198
APK2076I ........ 198
APK2077I ........ 198
APK2078I ........ 199
APK2079I ........ 199
APK2080I ........ 199
APK2082I ........ 200
APK2083I ........ 200
APK2084I ........ 200
APK2088I ........ 201
APK2089I ........ 201
APK2090I ........ 201
APK2093I ........ 202
APK2096I ........ 202
APK2102S ........ 202
APK2103I ........ 203
APK2104I ........ 203
APK2105W ........ 203
APK2108I ........ 204
APK2116S ........ 204
APK2120I ........ 204
APK2121I ........ 205
APK3506I ........ 205
APK3507I ........ 205

**Appendix A. Helpful hints for using ACIF........ 207**
Working with control statements that contain numbered lines........ 207
Placing TLEs in named groups to avoid storage problems........ 207
Understanding how ANSI and machine carriage controls are used........ 208
Understanding common methods of transferring files into AIX or Windows from other systems....... 209

Physical media....... 209
PC file transfer program....... 209
FTP....... 209
Download for z/OS....... 210
Other considerations....... 210
Creating Invoke Medium Map (IMM) structured fields....... 210
Indexing considerations....... 210
Using regular expressions....... 212
Using a regular expression on the TRIGGER parameter....... 213
Using a regular expression on the FIELD parameter....... 213
Using default values when regular expressions do not match....... 213
Other considerations for using regular expressions....... 214
Examples of using regular expressions....... 214
Concatenating the resource file and the document file....... 214
Processing inline resources....... 215
Specifying the IMAGEOUT parameter....... 215
Creating MO:DCA-P object containers....... 215
Processing Unicode complex text....... 216

**Appendix B. Processing resources installed with resource access tables....... 217**

**Appendix C. Structured fields that ACIF uses....... 219**
Tag Logical Element (TLE) structured field....... 219
TLEs generated by ACIF....... 219
TLEs in MO:DCA-P input files....... 219
TLEs in mixed-mode data input files....... 220
Begin Resource Group (BRG) structured field....... 221
Begin Resource (BRS) structured field....... 221
End Resource (ERS) and End Resource Group (ERG) structured fields....... 221
Begin Print File (BPF) and End Print File (EPF) structured fields....... 222
No Operation (NOP) structured field....... 222
Format of the resources file....... 223

**Appendix D. Format of the index object file....... 225**
Group-Level Index Element (IEL) structured field....... 225
Page-Level Index Element (IEL) structured field....... 226
Begin Document Index (BDI) structured field....... 226
Index Element (IEL) structured field....... 226
Tag Logical Element (TLE) structured field....... 227
End Document Index (EDI) structured field....... 227

**Appendix E. Format of the output document file....... 229**
Page groups....... 230
Begin Document (BDT) structured field....... 231
Begin Named Group (BNG) structured field....... 231
Tag Logical Element (TLE) structured field....... 231
Begin Page (BPG) structured field....... 232
End Named Group (ENG), End Document (EDT), and End Page (EPG) structured fields....... 232
Output MO:DCA-P data stream....... 232
Composed Text Control (CTC) structured field....... 232
Map Coded Font (MCF) Format 1 structured field....... 232
Map Coded Font (MCF) Format 2 structured field....... 232
Presentation Text Data Descriptor (PTD) Format 1 structured field....... 233
Inline resources....... 233
Page definitions....... 233

**Appendix F. Accessibility....... 235**

Accessibility features........ 235
Consult assistive technologies........ 235
Keyboard navigation of the user interface........ 235
Dotted decimal syntax diagrams........ 235

**Notices........ 239**

Terms and conditions for product documentation........ 240
IBM Online Privacy Statement........ 241
Policy for unsupported hardware........ 241
Minimum supported hardware........ 242
Programming interfaces........ 242
Trademarks........ 242

**Glossary........ 243**

**Bibliography........ 255**

Advanced Function Presentation (AFP)........ 255
Text Processing........ 255

**Index........ 257**

# List of Figures

1. How ACIF fits into Advanced Function Presentation....2
2. AFP document with index tags and the index object file.... 5
3. Example bank statement input file.... 6
4. ACIF processing parameters to index a bank statement.... 6
5. Using ACIF to prepare files for viewing....9
6. Using ACIF to prepare files for distributed printing.... 10
7. Using ACIF to prepare files for archiving and retrieving....11
8. AFP Workbench Viewer....12
9. PRODUCT entry for ACIF in your IFAPRDxx member of SYS1.PARMLIB....15
10. Sample z/OS JCL to run ACIF....15
11. Sample VM/CMS commands to run ACIF....17
12. Sample VSE JCL to run ACIF....18
13. Example of a customer's printed telephone bill.... 84
14. Example of the line data telephone bill....86
15. Example of a parameter file for EBCDIC input data....87
16. Example of a parameter file for ASCII input data....87
17. Example of a z/OS parameter file.... 88
18. Example of a VM parameter file....89
19. Example of a VSE parameter file.... 90
20. Example of the enhanced indexing telephone bill.... 95
21. Example of an enhanced indexing parameter file....96
22. Example of report with UTF-16 data.... 97
23. Example of a parameter file for UTF-16 input data.... 97
24. Sample input record exit DSECT....100
25. z/OS, VM, or VSE sample index record exit DSECT.... 101
26. z/OS, VM, or VSE sample output record exit DSECT.... 102
27. z/OS, VM, or VSE sample resource exit DSECT.... 104
28. z/OS, VM, or VSE sample print file attributes DSECT....106
29. Example of ACIF parameters for processing documents with Unicode data.... 211
30. Example of code that contains group-level indexing....229
31. Example of code that contains group- and page-level indexing.... 230

# List of Tables

1. Term definitions....xviii
2. SYS1.SAMPLIB members for PSF documentation updates.... xx
3. ACIF parameters and operating systems.... 22
4. ACIF enhanced indexing parameters.... 67
5. Font short names to use with CHARS parameter....82
6. Output files ACIF creates.... 93
7. FOCA font naming conventions.... 233

# About this publication

This publication describes Advanced Function Presentation Conversion and Indexing Facility (ACIF), which is available for use with Print Services Facility (PSF) in the z/OS, VM, and VSE environments.

**Note:** ACIF is also used by Infoprint Server on IBM® i and on AIX®, Linux, and Windows; however, this information only describes how to use ACIF with PSF. For information about using ACIF with Infoprint Server on IBM i, see *Infoprint Server for iSeries: User's Guide*.

This publication assumes that you are familiar with Advanced Function Presentation (AFP) concepts and the parameters that you specify when printing with PSF. If you are not familiar with AFP concepts, see *Guide to Advanced Function Presentation*. If you are not familiar with the PSF print parameters, see *PSF for z/OS: User's Guide*.

This publication also assumes that you are familiar with Mixed Object Document Content Architecture for Presentation (MO:DCA-P) and structured fields. You can see *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* to read about those topics.

## Who should read this publication

This publication contains information that application programmers can use to develop ACIF applications that do these functions:

- Convert line data and XML data print files to MO:DCA-P documents.
- Add indexing tags to documents.
- Create a separate index object file from the indexing tags in a MO:DCA-P document.
- Retrieve and package AFP resources that are needed for printing or viewing a MO:DCA-P document.

**Note:** This publication provides ACIF messages that contain instructions for the system programmers responsible for maintaining the operating system and the PSF program that is running on it. You might need to show these messages to your system programmer for assistance from time to time.

## How this publication is organized

This publication contains information that pertains to ACIF support for z/OS, VM, and VSE operating environments that are used by PSF:

- Chapter 1, "Understanding ACIF," on page 1 presents an overview of tasks you can do with the ACIF product, describes several related products, and describes system considerations for using ACIF.
- Chapter 2, "Using ACIF," on page 15 provides sample code for running ACIF.
- Chapter 3, "ACIF parameters," on page 21 describes the parameters that are used for ACIF processing, including syntax rules and parameter values.
- Chapter 4, "Enhanced indexing parameters," on page 67 describes the parameters that are used for ACIF enhanced indexing with PSF for z/OS.
- Chapter 5, "Examples of using ACIF," on page 81 shows examples of an ACIF application.
- Chapter 6, "User exits and input print file attributes," on page 99 describes the exits available for customizing ACIF.
- Chapter 7, "ACIF messages," on page 109 provides the ACIF messages, with suggestions for responding to the errors.
- The appendixes contain more information about ACIF:

– Appendix A, “Helpful hints for using ACIF,” on page 207 describes some considerations of using ACIF as a front-end preprocessor for viewing, archiving, and retrieving information.
– Appendix B, “Processing resources installed with resource access tables,” on page 217 describes what resources are installed with a resource access table (RAT).
– Appendix C, “Structured fields that ACIF uses,” on page 219 describes the structured-field information for indexing.
– Appendix D, “Format of the index object file,” on page 225 describes the file that enables applications to determine the location of a page group or page within the MO:DCA-P print file, which is based on the indexing tags.
– Appendix E, “Format of the output document file,” on page 229 shows the three separate output files that ACIF can produce.
– Appendix F, “Accessibility,” on page 235 describes the accessibility features available in z/OS.

A notices section, glossary, bibliography, and index are included. The bibliography lists the publications that contain additional information about AFP, PSF, and related products.

## What terms are used in this publication

The terms document, file, and library are used throughout this publication. In all systems, document is a file that contains AFP structured fields in MO:DCA-P format. The terms *file* and *library* have different meanings in different operating systems. Table 1 on page xviii lists the meanings of *file* and *library* in z/OS, VM, and VSE operating systems.

*Table 1: Term definitions*

| Operating System | File | Library |
|---|---|---|
| **z/OS** | • A sequential data set<br>• A member of a partitioned data set<br>• The name of a DD card | • A partitioned data set<br>• A series of concatenated data sets |
| **VM** | A CMS file (*filename filetype filemode*) | A collection of CMS files, generally with the same file type |
| **VSE** | A sequential (SAM) file | A library.sublibrary |

## Understanding the notational conventions used in this publication

This publication uses consistent conventions for these notational conventions:

- Highlighting
- Syntax notation

### Highlighting

This publication uses the following highlighting conventions:

**Bold**
Identifies commands, keywords, parameters, and other items, whose names are predefined by the system or must be entered as is, such as `acif`.

***Italic***
Identifies parameters whose actual names or values you supply. Italics also identify the names of publications.

**`Monospace`**
Identifies files, directories, examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you actually type.

### Syntax notation

This publication uses the following syntax notation:

- Italics within a command represent variables for which you must supply a value. For example:

  CPGID=*codepageid*

  means that you enter CPGID= as shown and then replace the variable *codepageid* with a value that represents any valid code page, which is 3-character decimal value (for example, 395) that defines an IBM-registered code page.
- Do not enter the following symbols as part of the command:

  **Vertical bar**
  |

  **Braces**
  { }

  **Brackets**
  [ ]

  **Underscore**
  _

These symbols have the following meanings:

- A vertical bar, |, between values indicates that you can enter only one of the values with the command. For example:

  ```
  CC={YES | NO}
  ```

  means that when you enter CC=, you can specify either YES or NO as the value, but not both.
- Braces, { }, around values indicate a required value. For example:

  ```
  CC={YES | NO}
  ```

  means that when you enter CC=, you must also enter YES or NO.
- Brackets, [ ], around parameters indicate that they are optional. For example:

  [CC=*value*] [CCTYPE=*value*]

  means that you do not have to enter either CC=*value* or CCTYPE=*value*.
- An underscore, _, indicates the default value, which ACIF uses if you do not specify the parameter with a non-default value. For example:

  CC={<u>YES</u> | NO}

  means that if the CC= parameter is not entered, ACIF uses the default value of YES for the CC parameter.

## Related information

Publications that are referred to in this document or that contain more information about AFP and related products are listed in the "Bibliography" on page 255. For information about all z/OS product publications, see *z/OS Information Roadmap*.

For more information about z/OS and PSF for z/OS, see these web pages:

- z/OS home page (www.ibm.com/systems/z/os/zos)

• z/OS Print Management Software (www.ibm.com/systems/z/os/zos/printsoftware)

To obtain the latest documentation updates for z/OS base elements and optional features that result from DOC APARs and PTFs, go to z/OS APAR book (publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/Shelves/ZDOCAPAR).

To obtain the latest documentation updates for ACIF, see the APKGUSR5 member in APK.SAPKSAM1.

To obtain the latest documentation updates for PSF for z/OS, see the appropriate SYS1.SAMPLIB members in Table 2 on page xx.

*Table 2: SYS1.SAMPLIB members for PSF documentation updates*

| Member | Publication |
|---|---|
| **APSGADP6** | *PSF for z/OS: AFP Download Plus* |
| **APSGCUS6** | *PSF for z/OS: Customization* |
| **APSGDGN6** | *PSF for z/OS: Diagnosis* |
| **APSGDLG6** | *PSF for z/OS: Download for z/OS* |
| **APSGMAC6** | *PSF for z/OS: Messages and Codes* |
| **APSGSEC6** | *PSF for z/OS: Security Guide* |
| **APSGUSR6** | *PSF for z/OS: User's Guide* |

# How to send your comments to IBM

We invite you to submit comments about the z/OS product documentation. Your valuable feedback helps to ensure accurate and high-quality information.

**Important:** If your comment regards a technical question or problem, see instead "If you have a technical problem" on page xxi.

Submit your feedback by using the appropriate method for your type of comment or question:

**Feedback on z/OS function**
If your comment or question is about z/OS itself, submit a request through the IBM RFE Community (www.ibm.com/developerworks/rfe/).

**Feedback on IBM Knowledge Center function**
If your comment or question is about the IBM Knowledge Center functionality, for example search capabilities or how to arrange the browser view, send a detailed email to IBM Knowledge Center Support at ibmkc@us.ibm.com.

**Feedback on the z/OS product documentation and content**
If your comment is about the information that is provided in the z/OS product documentation library, send a detailed email to mhvrcfs@us.ibm.com. We welcome any feedback that you have, including comments on the clarity, accuracy, or completeness of the information.

To help us better process your submission, include the following information:

- Your name, company/university/institution name, and email address
- The following deliverable title and order number: ACIF User's Guide, S550-0436-05
- The section title of the specific information to which your comment relates
- The solution title: ACIF User's Guide
- The text of your comment.

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

IBM or any other organizations use the personal information that you supply to contact you only about the issues that you submit.

## If you have a technical problem

If you have a technical problem or question, do not use the feedback methods that are provided for sending documentation comments. Instead, take one or more of the following actions:

- Go to the IBM Support Portal (support.ibm.com).
- Contact your IBM service representative.
- Call IBM technical support.

# Summary of changes

This content includes terminology, maintenance, and editorial changes to information previously presented in *AFP Conversion and Indexing Facility User's Guide*, S550-0436-04. Technical additions or changes to the text and illustrations are indicated by a vertical line to the left of the change.

**New information**

- The latest documentation updates for ACIF are now located in the APKGUSR5 member in APK.SAPKSAM1. See "Related information" on page xix.
- ACIF now supports Metadata-1 objects. See "AFP data" on page 3 and the OBJCON value description in "RESTYPE" on page 60.
- The MO:DCA AFP/Archive (AFP/A), MO:DCA AFP/A, IS/3, and MO:DCA Graphic Arts Function Set (GA) interchange sets are new. See "Mixed Object Document Content Architecture data" on page 3, PASSPF value in "EXTENSIONS" on page 36, and "Begin Print File (BPF) and End Print File (EPF) structured fields" on page 222.
- The procedure for enabling ACIF in the SYS1.PARMLIB is added to "Using ACIF in z/OS" on page 15.
- The following ACIF parameters are new in Table 3 on page 22:
  - "DUPLEX" on page 35
  - "LINEOFFSET" on page 50
- A new ADDTLE value is added to "EXTENSIONS" on page 36. See also Table 3 on page 22.
- The BREAKYES enhanced indexing parameter is new. See Table 4 on page 67 and "BREAKYES" on page 68.
- Regular expressions support is added. See:
  - "Enabling ICONV translation services and regular expressions" on page 16.
  - MVSICNV value in "EXTENSIONS" on page 36 parameter.
  - REGEX option on the FIELD*n* and TRIGGER*n* parameters in Table 4 on page 67, "Transaction field" on page 71, and "TRIGGERn" on page 77.
  - "Using regular expressions" on page 212
- These messages are new:
  - " APK290I " on page 135
  - " APK291I " on page 135
  - " APK484S " on page 173
  - " APK485S " on page 173
  - " APK486S " on page 173
  - " APK487S " on page 173
  - " APK488S " on page 174
  - " APK489S " on page 174
  - " APK490S " on page 174
  - " APK491S " on page 174
  - " APK492I " on page 175
  - " APK494I " on page 175
  - " APK498S " on page 175
  - " APK2034S " on page 190
  - " APK2035S " on page 190

### Changed information

- A note in "Indexing documents" on page 4 is updated.
- The description of the RESORDER option is updated in "EXTENSIONS" on page 36.
- "Determining how literal values are expressed" on page 86 is updated to remove references to ASCII data.
- The location of ACIF sample code for z/OS, VM, and VSE exits is updated in "User programming exits" on page 99, and the references to AIX and Windows sample exits are removed.
- Text that describes exit processing is updated in "Input record exit" on page 99.
- PARMLIB END is added to the DSECT samples in "User programming exits" on page 99 and PFATTR END is added to the DSECT sample in "Attributes of the input print file" on page 106.
- These messages are updated:
  - " APK369S " on page 150
  - " APK386I " on page 152
  - " APK413S " on page 159
  - " APK469S " on page 170
- "Glossary" on page 243 is updated with the definitions for "MO:DCA AFP/Archive", "MO:DCA AFP/A, IS/3", "MO:DCA Graphic Arts Function Set", and "regular expression".

### Deleted information

- All references to InfoPrint Manager and InfoPrint AFP Resource Installer, and using ACIF on AIX, Linux, and Windows operating systems are removed from this publication.
- References to unformatted ASCII data are deleted throughout the publication.
- References to the `acif` command, which is used with AIX and Windows, is deleted.
- These ACIF parameters that are used in AIX and Windows are deleted from "Parameter values for ACIF" on page 22: FILEFORMAT, INPCCSID, OUTCCSID, and RESLIB. See also Figure 23 on page 97 and Figure 29 on page 211.

# Chapter 1. Understanding ACIF

AFP Conversion and Indexing Facility (ACIF) is a batch application development utility. You can use ACIF to create documents by formatting line data (record format and traditional), XML data, and MO:DCA-P print files, and then print them with IBM Print Services Facility (PSF). ACIF also provides indexing and resource retrieval capabilities so you can view, distribute, archive, and retrieve document files across systems and operating systems.

ACIF is used in the z/OS, VM, and VSE environments.

This information gives an overview of ACIF, explains the functions that ACIF can do, describes different scenarios for processing your files, describes the IBM products that you can use with ACIF, and lists the system limitations and prerequisites you must consider for ACIF.

## Overview of ACIF

With ACIF you can do these tasks:

- Convert line data, XML data, or mixed data into Mixed Object Document Content Architecture for Presentation (MO:DCA-P) data, which is data that is composed into pages and includes data placement and presentation information (such as which font to use).
- Index a document to enhance your ability to view, archive, or retrieve individual pages or groups of pages from large documents; create a separate *index object file* from the indexing tags.
- Retrieve and package AFP resources that are needed for printing or viewing a document and place them in a separate file, so that you can print and view the exact document, possibly years after its creation.

ACIF accepts data from your application in these formats:

- AFP data
- MO:DCA-P data
- Record format or traditional line data
- Mixed-mode data
- XML data

ACIF can process application print data and AFP resources to produce these AFP files:

- Document file
- Resource file
- Index object file

With the files that ACIF creates, you can do these tasks:

- Use PSF to print the AFP document file. If you specified resources in the AFP document file, PSF references the AFP resource file for the names and locations of the resources. The AFP document file must be concatenated to the end of the resource file before the file is printed.
- Use the AFP Workbench Viewer application to view the AFP document file. AFP Workbench Viewer takes MO:DCA-P data and resources as input to produce output that can be viewed.
- Store report files and the index file entries that are created by ACIF in a document archival system, such as IBM Content Manager OnDemand. OnDemand operates in a client/server environment and supports small office environments and large enterprise installations with hundreds of system users. OnDemand provides a server to store report files and other types of business documents. Users can search for and retrieve files from the server with client programs that run under Microsoft Windows and z/OS CICS/ESA operating systems. OnDemand supports viewing with full fidelity and reprinting of report files on local and remote printers.
- Use your own archive system to store the ACIF-created files.

- Use your own retrieval system to access information in the ACIF files by using retrieval information in the index object file.

Figure 1 on page 2 shows a high-level overview of how ACIF fits into an installation's AFP process for creating, indexing, viewing, and printing documents. This figure shows the resources and text data that can feed into ACIF for processing. The resources and text data can be provided and used by various AFP and AFP-compatible products. The files that ACIF produces can then be sent to a customer-supplied archival and retrieval system, to the spool, or to the AFP Workbench Viewer for viewing.

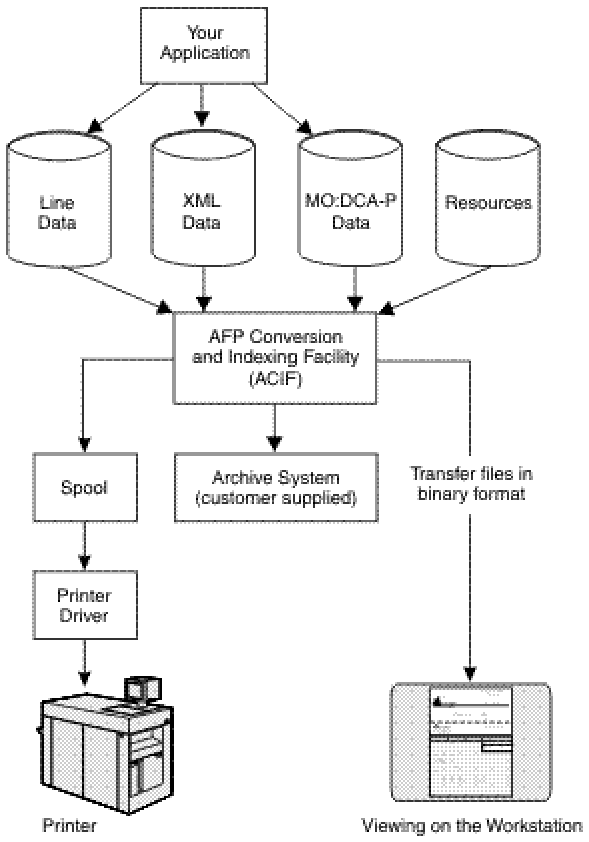

Your Application
Line Data
XML Data
MO:DCA-P Data
Resources
AFP Conversion and Indexing Facility (ACIF)
Spool
Archive System (customer supplied)
Transfer files in binary format
Printer Driver
Printer
Viewing on the Workstation

*Figure 1: How ACIF fits into Advanced Function Presentation*

## ACIF functions

You can use ACIF to do these functions:

- Convert data streams
- Index documents
- Retrieve resources

### Converting data streams

ACIF processes these input data streams to create a MO:DCA-P document:

- AFP data
- MO:DCA-P data
- Record format or traditional line data
- Mixed-mode data
- XML data

### AFP data

The AFP data stream is a superset of the MO:DCA-P data stream and supports these objects:

- Graphics (GOCA)
- Presentation text (PTOCA)
- Image (IOCA and IM)
- Bar code (BCOCA)

Metadata-1 objects are supported when they are in the first resource group. Multiple Metadata-1 objects are allowed if they are contiguous.

The AFP data stream also supports print resources such as fonts, overlays, page segments, form definitions, and page definitions. Fonts are either Font Object Content Architecture (FOCA) fonts or TrueType and OpenType fonts, which are not defined by FOCA.

For more information about this data stream format, see *Mixed Object Document Content Architecture Reference*, which points to publications that describe the other types of data objects.

### Mixed Object Document Content Architecture data

Mixed Object Document Content Architecture (MO:DCA) is an architected, device-independent data stream that is used for interchanging documents between different systems. ACIF accepts these MO:DCA Presentation Interchange Set (IS) data streams:

**MO:DCA AFP Archive (AFP/A)**
: Ensures page independence and eliminates images without clearly specified resolution, device default fonts, and external resources.

**MO:DCA IS/3**
: Provides interoperability among AFP products that are MO:DCA IS/3 compliant. It also provides enhanced functions, including support for color and the latest fonts, images, and graphics.

**MO:DCA AFP/A, IS/3**
: Complies with the rules and restrictions of both the AFP/A and IS/3 interchange sets.

**MO:DCA Graphic Arts Function Set (GA)**
: Adds PDF presentation object container support with this extension of MO:DCA IS/3.

ACIF supports MO:DCA-P data with these restrictions:

- Every structured field must be in one record and cannot span multiple records.
- Each record (structured field) must contain a X'5A' character before the first byte of the structured field introducer.

ACIF does not change most of the MO:DCA-P structured fields it processes because they are already in the correct format. However, although the MO:DCA-P input data stream might contain multiple Begin Document (BDT) and End Document (EDT) structured fields, the ACIF output normally contains only one BDT/EDT structured-field pair. To pass all of the BDT/EDT pairs to the output data stream, the INDEXOBJ=BDTLY parameter is specified. See "Output MO:DCA-P data stream" on page 232 for information about the changes ACIF makes to support MO:DCA-P output format.

For more information about the MO:DCA-P data stream, see *Mixed Object Document Content Architecture Reference*.

### Line data

Line data is application data that is prepared for printing without any data placement or presentation information. Line data can be either traditional line data or record format line data. Traditional line data is data that is prepared for printing on a line printer. Record format line data is a form of line data where each record is preceded by a variable length identifier.

ACIF formats line data into pages by using a page definition (PAGEDEF) resource, in the same manner as PSF. For more information about line data, see *Advanced Function Presentation: Programming Guide and Line Data Reference*.

### Mixed-mode data

Mixed-mode data is a mixture of line data (with the inclusion of some AFP structured fields), composed-text pages, and resource objects such as image, graphics, bar code, and text. For more information about this data stream, see *Advanced Function Presentation: Programming Guide and Line Data Reference*.

### XML data

Data that is identified by using Extensible Markup Language (XML) standards from the World Wide Web Consortium is called XML data. XML does not describe data placement or presentation information. For printing on page printers, a page definition is required to provide the data placement and presentation information. The XML data that is processed by ACIF can be encoded in EBCDIC, ASCII, UTF-8 or UTF-16. For more information about XML data, see *Advanced Function Presentation: Programming Guide and Line Data Reference* and *Extensible Markup Language (XML) 1.0 Specification* at W3C (www.w3.org).

## Indexing documents

One of the principal tasks you can do with ACIF is indexing print files, which are also known as documents. When indexing with ACIF, you can divide a large print file into smaller, uniquely identifiable units, called *groups*, as defined by the MO:DCA-named group structured fields. For example, you can use ACIF to divide a large bank-statement application into individual groups by inserting structured fields that define group boundaries into the file. A group is a named collection of sequential pages, which, in this example, consists of the pages that describe a single customer's account. For example, a bank-statement application probably produces a large printout that consists of thousands of individual customer statements. You can think of each of these statements as smaller, separate units, each uniquely identifying an account number, date, Social Security number, or other attributes.

You can also use ACIF to create an index object file to do these tasks:

- Retrieve individual statements from storage, which is based on an account number or any other attribute.
- More rapidly access the statements for viewing by, for example, the AFP Workbench Viewer.
- Archive individual statements or the entire indexed print file for long-term storage and subsequent data management and reprinting, even years after its creation.

In addition to building an index-information file that contains structured fields (the *index object file*), ACIF also inserts strings of character data, called *tags*, in the print file in structured-field format. ACIF inserts these same structured fields in the index object file. (The tags are contained in Tag Logical Element [TLE] structured fields, which are described in Appendix A, “Helpful hints for using ACIF,” on page 207 and Appendix C, “Structured fields that ACIF uses,” on page 219.) You can use the indexing-tag structured fields to identify a group of pages.[1] Figure 2 on page 5 shows the relationship between the group-level tags and the entries in the index object file.

[1] With ACIF, you can generate group-level tags and also page-level tags with enhanced indexing; with Document Composition Facility (DCF) and AFP Toolbox, you can generate both group-level tags and page-level tags. For more information about these products, see “IBM products used with ACIF” on page 11.

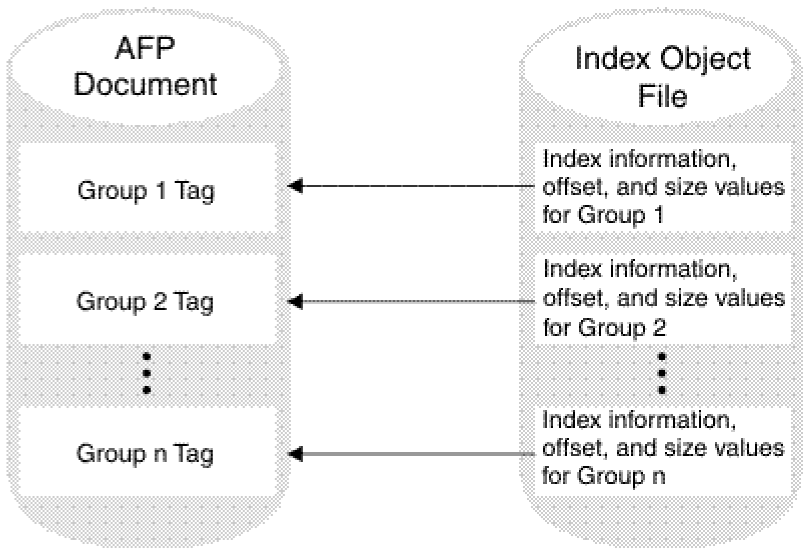

AFP Document
Group 1 Tag
Group 2 Tag
Group n Tag
Index Object File
Index information, offset, and size values for Group 1
Index information, offset, and size values for Group 2
Index information, offset, and size values for Group n

*Figure 2: AFP document with index tags and the index object file*

ACIF can create an index object file for these types of input files:

- Line data, XML data, or mixed-mode data
- AFP data that is produced by the AFP Application Programming Interface (API), DCF, or by AFP Toolbox, with or without indexing tags
- AFP data that is produced by any other application

**Note:** For AFP data, you produce an index object file from an input file that contains index tags. You do not add new indexing tags to an existing file unless the ADDTLE extension is enabled. For more information, see "EXTENSIONS" on page 36.

ACIF provides these ways for you to generate the indexing tags placed in the print file:

- Use literal values that you specify to ACIF, which is useful when the values you want to use in the indexing tags are not consistently present in the data. This kind of indexing is called *indexing with literal values.*
- When the data is formatted, use values present in the input data itself so that ACIF can reliably locate the values. This kind of indexing is called *indexing with data values.*

### Indexing with literal values

Some print files, such as technical documents and memos, cannot be divided easily into groups of pages by using values in the data because no data value is consistently present in the same location. Likewise, the output of an application might not contain the data that you would like to use for an indexing tag. In these cases, you can specify one or more literal values for ACIF to use in the indexing tags for a single group of pages. The ACIF parameter that you use in this case is the FIELD*n* parameter.

**Notes:**

1. If you are using ACIF to add indexing tags to a file, and the input file already contains indexing tags, ACIF issues an error message and stops processing. If the input file already contains indexing tags, you can create the index object file by running ACIF *without* specifying any indexing parameters.
2. ACIF includes the name of the output document in the index object file and includes the name of the index object file in the output document, which provides a method of correlating the index object file with the appropriate output document.

### Indexing with data values

Some applications such as payroll or accounting statements contain data that might be appropriate to use for indexing tags. In the bank statement example, the account number is a type of data value that you might want to tag. You can then archive a single customer's account statement by account number, and you can retrieve and view the same statement with the account number. If the data value you want to use in an indexing tag is consistently in the same place for each statement, you can specify ACIF parameters that create a separate group of pages for each statement. The ACIF parameters that you use in this case are the TRIGGER*n*, FIELD*n*, and INDEX*n* parameters.

***Example of indexing with data values***

This example shows how to use the ACIF parameters described in Chapter 3, "ACIF parameters," on page 21. Figure 3 on page 6 shows the print file for a typical bank statement.

```
1ACCOUNT NUMBER: 445-66-3821-5        PAGE 1
 CUSTOMER NAME: HENRY WALES
 DATE: 09/30/09
 CHECK# 001 - 455.00
 CHECK# 002 - 337.85
 ...
1ACCOUNT NUMBER: 333-56-4378-5        PAGE 1
 CUSTOMER NAME: KATHERINE CHARLES
 DATE: 09/30/09
 CHECK# 221 - 5.00
 CHECK# 222 - 1567.35
 ...
```

*Figure 3: Example bank statement input file*

In Figure 3 on page 6, the print file contains bank statements dated September 30, 2009 (09/30/09). Each statement has the same general format, although statements might vary in size or number of pages. Assume that you want to index the bank statements with the account number and the date. Although the account number identifies each customer's account, the date is important to differentiate one month's statement from another. For ACIF to extract the account number and date, it must first locate the records that contain the required information.

Because ACIF can process different data streams with various file formats (for example, carriage control characters, no carriage control characters, and table-reference characters), it requires *triggers* to determine an *anchor point* from which it can locate the necessary index values. You can require multiple triggers to uniquely identify the start of a new statement. To index the bank statements with the account number and the date, first define the trigger values and the fields as shown in Figure 4 on page 6.

```
TRIGGER1=*,1,'1'
TRIGGER2=0,39,'PAGE 1'
FIELD1=0,18,3
FIELD2=0,22,2
FIELD3=0,25,4
FIELD4=0,30,1
FIELD5=2,8,2
FIELD6=2,11,2
FIELD7=2,14,2
INDEX1='Account Number',FIELD1,FIELD2,FIELD3,FIELD4
INDEX2='Date',FIELD5,FIELD6,FIELD7
```

*Figure 4: ACIF processing parameters to index a bank statement*

The information in Figure 4 on page 6 defines two trigger values:

- The first trigger instructs ACIF to examine the first byte of every input record until it finds the occurrence of an ANSI skip-to-channel 1 carriage control character ('1'). Because each page that is created by this particular application can contain this carriage control character, this trigger alone does not identify the start of a new bank statement.

- The second trigger accomplishes this task. When ACIF locates a record that contains a '1' in the first byte, it looks for the string ‘PAGE 1’ in that same record, starting at byte (column) 39. If this condition is found, a new statement exists, and ACIF uses the record that contains TRIGGER1 as the anchor point. The FIELD*n* definitions are relative to this anchor point.

In Figure 4 on page 6, the account number has four fields. These fields can be defined as one field if the dashes are included as part of the index information. The date has three fields to remove the forward slashes. After ACIF extracts all of the necessary indexing information for this statement, it begins looking for TRIGGER1 again. This process is repeated until the entire print file is processed.

In summary, when ACIF indexes an input file, it first scans the input file to find matches for its parameters. When ACIF finds matches in the input file, it inserts structured fields immediately before the corresponding pages of the output file. Also, ACIF places structured fields in the index object file that point to matches in the output file.

### Indexing limitations

For a line data or XML application that does not contain the appropriate data values in the application output and for which literal values are not suitable, the application program cannot insert tagging structured fields in the print data because tagging structured fields are not allowed in mixed-mode data. In the case where the application data does not contain the necessary appropriate data values for indexing, the application can add the index triggers. One possible location is the record that contains the new-page carriage control character (for example, a skip-to-channel 1). The application must add the indexing trigger and attribute value to this record at a specified location on each statement in the print file. ACIF can then retrieve this information at processing time. (For information about different types of carriage control characters, see “CCTYPE” on page 32 for a description of the parameter.)

## Retrieving resources

ACIF can determine the list of required AFP resources that are needed to view or print the document and retrieve these resources from the specified libraries. You can then view or print the document with fidelity. This ACIF function is especially valuable if the resources are not present on the designated system in a distributed print environment.

When you archive a document with ACIF, you can also archive the retrieved resources (such as fonts and page segments) in the form in which they existed when the file was printed. By archiving the original resources, you can reproduce the document with fidelity in the future, even if the resources are different. For example, suppose that a page segment contains a company officer's signature and is included in the print data. When someone else replaces the officer, current print files must reference the new officer's signature, but archived files must reference the former officer's signature.

The type of resources ACIF retrieves from specified libraries is based on the value of the RESTYPE parameter. When ACIF processes a print file, it:

- Identifies the resources that the print file requests:

  While ACIF converts the input file into an AFP document, it builds a list of all the resources necessary to successfully print the document, including all the resources referenced inside other resources. For example, a page can include an overlay, and an overlay can reference other resources such as fonts and page segments.

- Creates a resource file:

  ACIF creates a logical resource library in the form of an AFP resource group and stores this resource group in a resource file. If you specify RESTYPE=ALL, this resource file contains all the resources necessary to view or print the document with fidelity. Each time ACIF processes a print file, it can create a resource file in one of two different formats:

  **Partitioned data set (PDS)**
  The PDS format is supported only on z/OS, and is used to reference the resource file as a user library (USERLIB) when you are printing with PSF.

**AFP data stream resource group**

The AFP resource-group format is useful when you are routing print output to remote AFP systems or when you are storing a print file in an archive system, such as Content Manager OnDemand.

See Appendix B, “Processing resources installed with resource access tables,” on page 217 for information about how ACIF retrieves resources from the resource access table (RAT).

- Calls the specified resource exit for each resource it retrieves:

  Before ACIF retrieves a resource from a library, it first calls the resource exit program as specified in the RESEXIT parameter. You can write an exit program to filter out any resources you do not want included in the resource file. For example, the exit program can specify that all referenced fonts, except for a specific typeface, be included in the resource file. The only way to accomplish this action is by using the resource exit.
- Includes the name of the output document in the resource file and the name of the resource file in the output document, which provides a method of correlating resource files with the appropriate output document.

Examples of specifying ACIF processing parameters for resource retrieval can be found in Chapter 5, “Examples of using ACIF,” on page 81.

## Scenarios for processing ACIF files

ACIF can process your files for:

- Viewing with AFP Workbench Viewer
- Printing locally and on other systems
- Archiving and retrieving selectively

The following information shows scenarios for preparing files for viewing, printing, and archiving.

### Preparing files for viewing

Figure 5 on page 9 shows the steps that you can take to prepare files for viewing with the AFP Workbench Viewer:

1. The process begins with your application (1), which is the program that processes your print data.
2. Your application creates your print data (2a) and optionally creates ACIF processing parameters (2b). Resources are stored in PSF resource libraries (2c).
3. You run ACIF (3), specifying that it create the index object file (3a), the AFP document (3b), and the resource file (3c).
4. For optimal performance in locating pages in a file, you concatenate (4) the index object file to the AFP document. If the resources used by the document are not present on the workstation where the AFP Workbench Viewer is installed, you concatenate the resource file to the AFP document file. The order of concatenation must be shown as in Figure 5 on page 9, with the document file concatenated last.
5. Transfer (5) the needed files in binary format to the workstation.
6. Using the AFP Workbench Viewer, view (6) your indexed document. You can also print the document from the AFP Workbench Viewer.

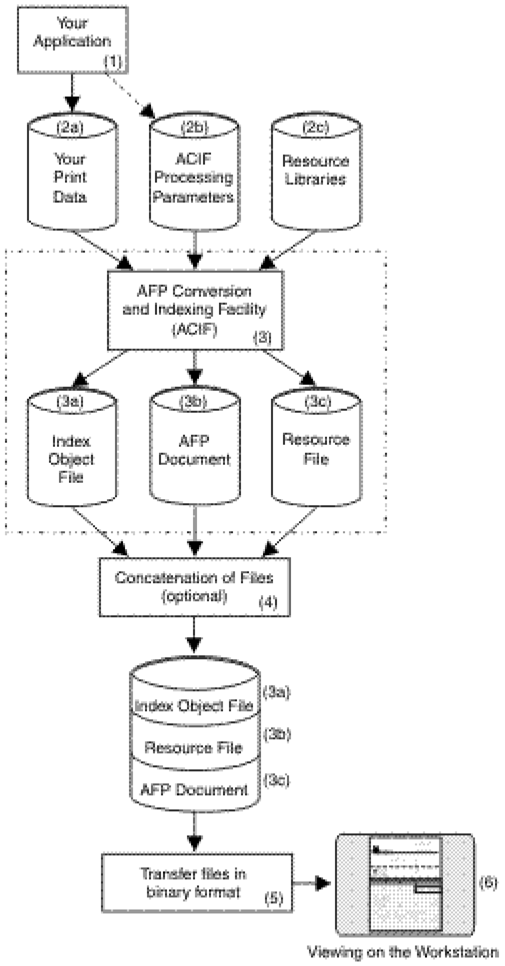


*Figure 5: Using ACIF to prepare files for viewing*

## Preparing files for printing

Figure 6 on page 10 shows the steps that you can take to prepare your files for printing:

1. Run ACIF (1), specifying that it create the AFP document file (1a) and the resource file (1b).
2. If the PSF print driver program that manages jobs for your target printer runs on a different operating system than the one on which you run ACIF, transfer the files in binary format (2) to the system where PSF runs.

   If your resources are not present on the remote PSF system, concatenate the AFP document file to the end of the resource file before you submit the file to PSF. If your resources are already present on the remote PSF system, you do not have to concatenate or transmit them.
3. Submit (3) your MO:DCA-P print job to PSF.

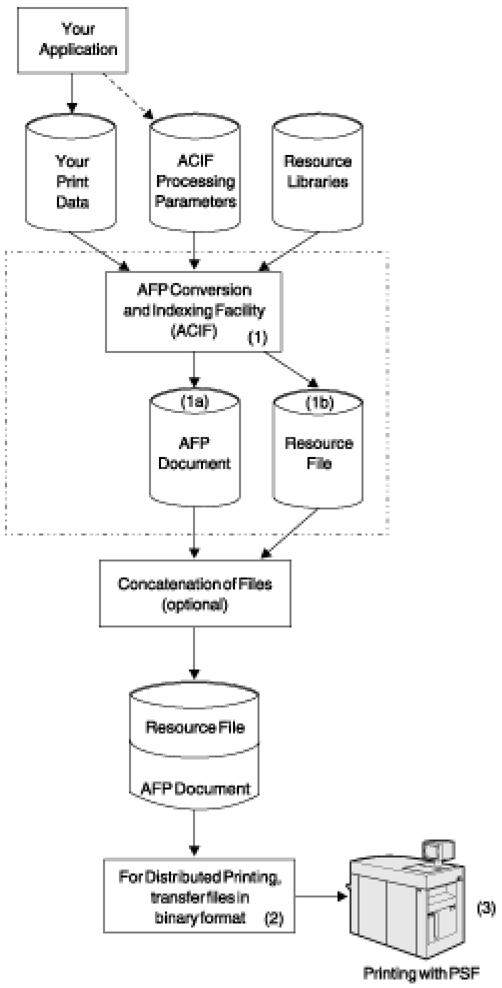

Your Application
Your Print Data
ACIF Processing Parameters
Resource Libraries
AFP Conversion and Indexing Facility (ACIF) (1)
(1a) AFP Document
(1b) Resource File
Concatenation of Files (optional)
Resource File
AFP Document
For Distributed Printing, transfer files in binary format (2)
(3)
Printing with PSF

*Figure 6: Using ACIF to prepare files for distributed printing*

## Preparing files for archiving and retrieval

Figure 7 on page 11 shows the steps that you can use to archive your files:

1. Run ACIF (1), specifying that it create the index object file (1a), the AFP document file (1b), and the resource file (1c).
2. Run your archival application (2) to archive (3) all three files (1a, 1b, 1c) so that the document can later be retrieved (4) and viewed or printed with fidelity.

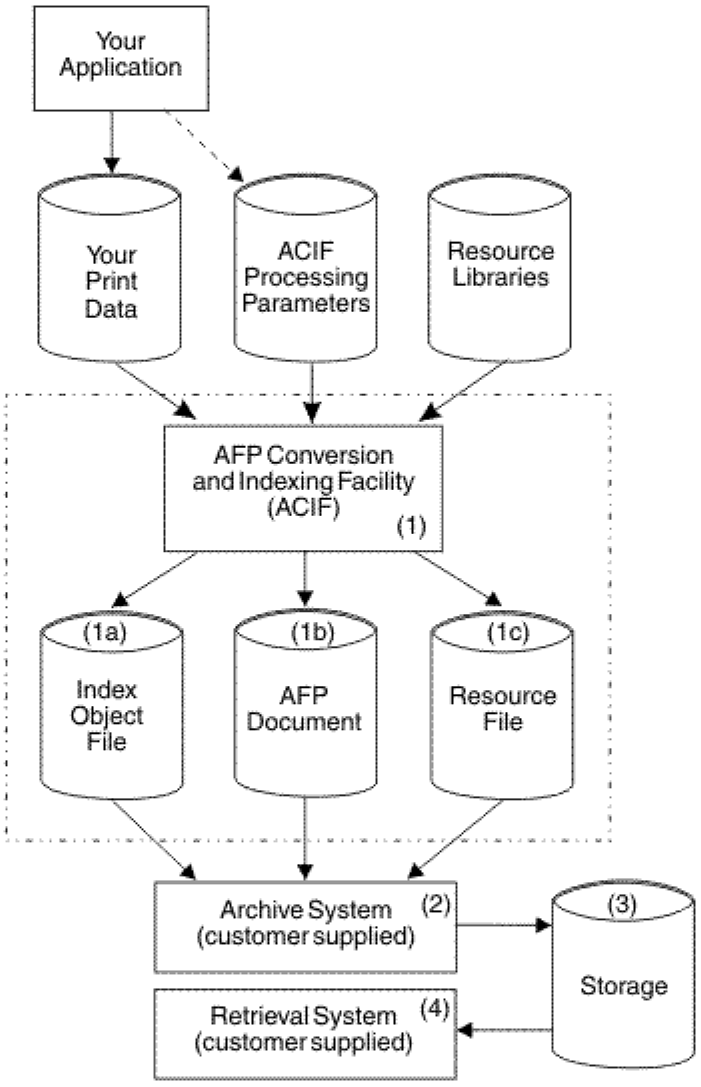

Your Application
Your Print Data
ACIF Processing Parameters
Resource Libraries
AFP Conversion and Indexing Facility (ACIF) (1)
(1a) Index Object File
(1b) AFP Document
(1c) Resource File
Archive System (customer supplied) (2)
(3) Storage
Retrieval System (customer supplied) (4)

*Figure 7: Using ACIF to prepare files for archiving and retrieving*

## IBM products used with ACIF

Although ACIF is a stand-alone utility, it was designed for use with these IBM products:

- AFP Workbench Viewer
- AFP Toolbox
- Document Composition Facility (DCF)

### AFP Workbench Viewer

Figure 8 on page 12 shows how AFP Workbench Viewer can display documents on a workstation that is running Microsoft Windows operating systems. These documents can contain an index object file and a resource group.

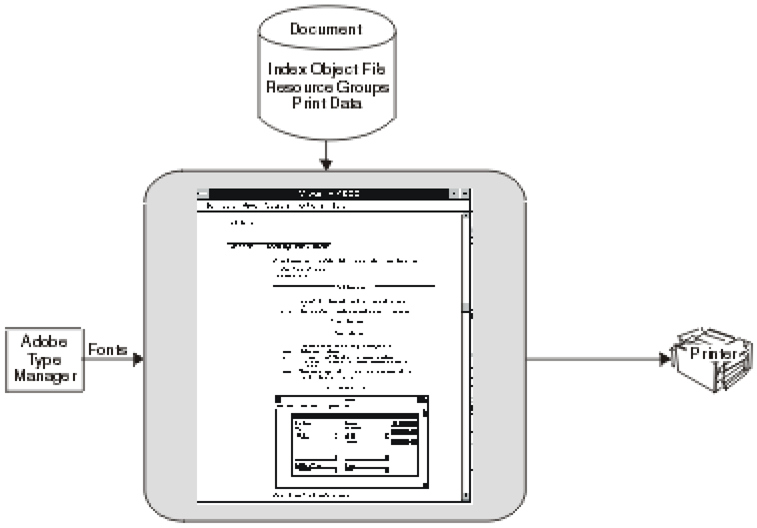


*Figure 8: AFP Workbench Viewer*

AFP Workbench Viewer uses Adobe Type 1 or TrueType and OpenType outline fonts when it displays documents. If the document references an AFP font for which no Type 1 font is available at the workstation, AFP Workbench Viewer can substitute an outline font for the requested font. AFP Workbench Viewer matches the requested point size and attempts to match the typeface as closely as possible. Font definition files are available with AFP Workbench Viewer so you can define which Type 1 fonts are to be substituted for your FOCA fonts.

Because AFP Workbench Viewer uses font substitution for AFP font resources instead of retrieving fonts from a resource file, you do not need to specify the RESTYPE=FONT or RESTYPE=ALL ACIF parameter when you are preparing a document to use with AFP Workbench Viewer. However, if you include AFP fonts in your document, the current version of AFP Workbench Viewer uses the font metrics to control character spacing. If you use AFP outline fonts, AFP Workbench Viewer also uses the font characters and substitutes font characters for raster fonts. If you do not want to use font substitution, use TrueType and OpenType fonts when you are creating the AFP document, keeping in mind that not all Intelligent Printer Data Stream (IPDS) printers support TrueType and OpenType fonts.

When you are using ACIF to index a file for viewing, specify INDEXOBJ=ALL. This setting provides AFP Workbench Viewer with the most complete indexing information for accessing groups of pages in a file. Also, concatenate the index object file to the document for optimal performance of AFP Workbench Viewer. (The document file must come last, at the end of the resulting concatenated file; otherwise, an error occurs.)

AFP Workbench Viewer supports a subset of MO:DCA-P data and might not display everything that PSF can print.

## AFP Toolbox

AFP Toolbox (Program Number 5655-A25) assists application programmers in formatting printed output. Without requiring knowledge of the AFP data stream, AFP Toolbox provides access to sophisticated AFP functions through a callable C, C++, or COBOL interface. With AFP Toolbox you can do these tasks:

- Combine variable data with electronic forms, electronic signatures, and images.
- Define variable length paragraphs.
- Draw fixed or variable depth and width boxes.
- Generate bar code objects.
- Draw horizontal and vertical fixed or variable length lines.
- Include indexing tags for use in efficient viewing, archival, and retrieval.
- Accent printed output with color and shading.

- Dynamically control fonts, including user-defined fonts.
- Precisely position and align text anywhere on a page with a wide variety of fonts.
- Create graphical data objects such as pie charts and bar charts.

AFP Toolbox is available on the z/OS operating system.

### Document Composition Facility (DCF)

Document Composition Facility (DCF) is a program that is used primarily to prepare and format documents for printing. It is another product that can be used with ACIF to index your data in the z/OS, VM, and VSE environments. Along with its many other features, DCF can add both group-level and page-level indexing tags; whereas, with ACIF, you can add only group-level indexing tags. Only ACIF generates the index object file.

In DCF, the indexing function is known as "navigation". DCF also provides a different function already called *indexing*. In DCF terminology, you *navigate* through a document with the viewing application, and its indexing function is used to build an alphabetical listing of page references (a *back-of-the-book index*).

Support for navigation (indexing) is provided with DCF Version 4.0. APAR PN36437 is required to enable the support. For more information about DCF, see *Document Composition Facility: SCRIPT/VS Language Reference*.

## System considerations for ACIF

You must consider these items when you are using ACIF:

- System limitations
- System prerequisites

### System limitations

ACIF is used with PSF products on various operating systems. However, not all ACIF functions are available in all environments. For example, PSF/VM and PSF/VSE are no longer functionally enhanced.

For specific information about the level of MO:DCA-P function that is supported, see the documentation for the PSF product you are using.

### System prerequisites

This information describes system prerequisites necessary to use ACIF in the z/OS, VM, and VSE environments.

**Note:** You can use later versions or releases of the products. Each of the products might require additional software products. See their respective publications for the current list of system requirements.

#### z/OS prerequisites

To see the z/OS software requirements for using ACIF, see *PSF for z/OS: Introduction*.

#### VM prerequisites

One of these VM software products is required to use ACIF:

- VM/SP 5 or later
- VM/SP HPO 5 or later
- VM/XA 1.2.1 or later
- VM/ESA 1.1.0 or later

PSF/VM 2.1.0 (with PTF UN37799 for printing files that contain indexing tags) or PSF/VM 2.1.1

## VSE prerequisites

One of these VSE software products is required to use ACIF:

- VSE/SP 4.1.2 or later
- VSE/ESA 1.1.0 or later

PSF/VSE 2.2.0 (with APAR DY42845 for printing files that contain indexing tags) or PSF/VSE 2.2.1 or later

# Chapter 2. Using ACIF

This information describes how to run ACIF in z/OS, VM, and VSE environments.

## Using ACIF in z/OS

To run ACIF in z/OS, you must ensure that SYS1.PARMLIB contains member IFAPRD*xx* and that ACIF is enabled in the member. Figure 9 on page 15 shows the PRODUCT entry that IFAPRD*xx* must contain for ACIF.

**Note:** The STATE value is set to ENABLED.

```
PRODUCT OWNER('IBM CORP')
        NAME('PSF for z/OS')
        ID(5655-M32)
        VERSION(*)
        RELEASE(*)
        MOD(*)
        FEATURENAME('ACIF')
        STATE(ENABLED)
```

*Figure 9: PRODUCT entry for ACIF in your IFAPRDxx member of SYS1.PARMLIB*

### z/OS JCL statements for running ACIF

Figure 10 on page 15 contains sample JCL that runs ACIF to process print output from an application.

```
//USERAPPL EXEC PGM=user application
//PRINTOUT DD DSN=print file,DISP=(NEW,CATLG)
//*
//ACIF     EXEC=APKACIF,PARM=[['PARMDD=ddname][,MSGDD=ddname']],REGION=3M
//INPUT   DD DSN=print file
//OUTPUT DD DSN=output file,DISP=(NEW,CATLG),
//             DCB=(LRECL=32756,BLKSIZE=32760,RECFM=VBA,DSORG=PS),
//             SPACE=(32760,(nn,nn)),UNIT=SYSDA
//RESOBJ DD DSN=resource file,DISP=(NEW,CATLG),
//             DCB=(LRECL=32756,BLKSIZE=32760,RECFM=VBA,DSORG=PS),
//             SPACE=(32760,(nn,nn)),UNIT=SYSDA
//INDEX  DD DSN=index file,DISP=(NEW,CATLG),
//             DCB=(LRECL=32756,BLKSIZE=32760,RECFM=VBA,DSORG=PS),
//             SPACE=(32760,(nn,nn)),UNIT=SYSDA
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
ACIF parameters go here
```

*Figure 10: Sample z/OS JCL to run ACIF*

The JCL statements that are used to run ACIF are described here. For more information about programming JCL, see *z/OS MVS JCL Reference*.

**USERAPPL**
: Represents the job step to run the application that produces the actual print output. *USERAPPL* or *user application* is the name of the program that produces the print data set.

**PRINTOUT**
: Specifies the DD statement that defines the output data set produced from the application. The application output cannot be spooled to the Job Entry Subsystem (JES) because ACIF does not read data from the spool. The *print file* is the name of the print data set created by the *user application*.

**ACIF**

Represents the job step that runs ACIF to process the print data set. You can specify two optional input parameters to ACIF:

**PARMDD**

Defines the DD name for the data set containing the ACIF processing parameters. If PARMDD is not specified, ACIF uses SYSIN as the default DD name and stops processing if SYSIN is not defined.

**MSGDD**

Defines the DD name for the message data set. When ACIF processes a print data set, it can issue various informational or error messages. If MSGDD is not specified as an invocation parameter, ACIF uses SYSPRINT as the default DD name and stops processing if SYSPRINT is not defined.

Although Figure 10 on page 15 shows a specified REGION size of 3 MB, this value can vary, depending on the complexity of the input data and the conversion and indexing options requested.

**INPUT**

Specifies the DD statement that defines the print data set to be processed by ACIF. In Figure 10 on page 15, this is the same data set as defined in the PRINTOUT DD statement.

**OUTPUT**

Specifies the DD statement that defines the name of the print data set that ACIF creates as a result of processing the application's print data set. Figure 10 on page 15 shows the DCB requirements.

**RESOBJ**

Specifies the DD statement that defines the name of the resource data set that ACIF creates as a result of processing the print data set. The RESOBJ file must be allocated with variable blocked records. This statement is not required if RESTYPE=NONE is specified in the processing parameter data set. For more information about the RESTYPE parameter, see "RESTYPE" on page 60.

**INDEX**

Specifies the DD statement that defines the name of the index object file that ACIF creates as a result of processing the application's print data set.

This parameter is not required:

- Unless indexing is requested or unless the input print data set contains indexing structured fields. If you are not sure whether the print data set contains indexing structured fields, and you do not want an index object file to be created, specify DD DUMMY; no index object file is created.
- If INDEXOBJ=NONE is specified in the processing parameter data set and no indexing keywords are specified (FIELD, INDEX, or TRIGGER).

**SYSPRINT**

Specifies the DD statement that defines the system output data set. If you are not writing messages to spool, the data set must have these attributes: LRECL=137,BLKSIZE=multiple of LRECL + 4 RECFM=VBA,DSORG=PS.

**SYSIN**

Specifies the DD statement that defines the data set containing the ACIF processing parameters. This is the default DD name if PARMDD is not specified as an invocation parameter.

**Note:** Files that are named by the FDEFLIB, PDEFLIB, PSEGLIB, and OVLYLIB parameters are allocated to system-generated DD names.

## Enabling ICONV translation services and regular expressions

The EXTENSIONS=MVSICNV parameter in ACIF initializes the CEEPIPI environment to enable the use of ICONV translation services and regular expressions on z/OS. The parameter is required if:

- The page definition specifies Quick Response (QR) Code bar codes and the line data contains DBCS characters.
- The page definition uses the VARIABLE option when it is specifying resource objects.
- The data contains PTOCA objects.

- Regular expressions are used for field or trigger searches.

To enable ICONV translation services and regular expressions:

1. Set up an OMVS segment in RACF® for the user ID of the job that runs APKACIF.
2. Specify `EXTENSIONS=MVSICNV` in ACIF.

   **Note:** When you specify the USERPATH, FONTPATH, or OBJCPATH parameter to request color management or TrueType and OpenType font support, MVSICNV is the default.

   For more information, see "EXTENSIONS" on page 36.

## Using ACIF in VM

Figure 11 on page 17 contains sample VM/CMS commands that run ACIF to process print output from an application.

```
USERAPPL
FILEDEF INPUT DISK filename filetype filemode
FILEDEF OUTPUT DISK filename filetype filemode (LRECL 32756 BLKSIZE 32760
FILEDEF RESOBJ DISK filename filetype filemode (LRECL 32756 BLKSIZE 32760
FILEDEF INDEX DISK filename filetype filemode (LRECL 32756 BLKSIZE 32760
FILEDEF SYSIN DISK filename filetype filemode
FILEDEF SYSPRINT DISK filename filetype filemode
APKACIF (PARMDD ddname MSGDD ddname
```

*Figure 11: Sample VM/CMS commands to run ACIF*

### VM/CMS commands for running ACIF

The CMS commands in Figure 11 on page 17 are explained as follows.

**USERAPPL**
Runs the application that produces the actual print output.

**INPUT**
Defines the DD name for the print file to be processed by ACIF. In Figure 11 on page 17, this is the same print file that is created by USERAPPL.

**OUTPUT**
Defines the DD name for the file that ACIF creates as a result of processing the application's print file.

**RESOBJ**
Defines the DD name for the resource file that ACIF creates as a result of processing the application's print file. This command is not required if RESTYPE=NONE is specified in the processing parameter file.

**INDEX**
Defines the DD name for the index object file that ACIF creates as a result of processing the application's print file.

This parameter is not required:

- Unless indexing is requested or unless the print file contains indexing structured fields. If you are not sure whether the print file contains indexing structured fields, and you do not want an index object file to be created, specify `FILEDEF INDEXDD DUMMY`; no index object file is created.
- If INDEXOBJ=NONE is specified in the processing parameter data set and no indexing keywords are specified (FIELD, INDEX, or TRIGGER).

**APKACIF**
Starts the ACIF program to process the application's print file. You can specify two optional input parameters to ACIF: PARMDD and MSGDD.

**PARMDD**
: Defines the DD name for the file that contains the ACIF processing parameters. If PARMDD is not specified, ACIF uses SYSIN as the default DD name and stops processing if SYSIN is not defined.

**MSGDD**
: Defines the DD name type for the message file. When ACIF processes a print file, it can issue various informational or error messages. If MSGDD is not specified as an invocation parameter, ACIF uses SYSPRINT as the default DD name and stops processing if SYSPRINT is not defined. MSGDD requires an LRECL of 137 and a block size that is a multiple of 137 plus 4 (for example, `(137*10)+4 =1374`).

**Note:** The ACIF naming convention for the DD name is the same as the one that is used in z/OS.

ACIF requires about 3 MB of virtual memory to convert and index files. The amount of memory can vary, depending on the complexity of the input data and the conversion and indexing options requested.

## Using ACIF in VSE

Figure 12 on page 18 contains sample JCL that runs ACIF to process print output from an application.

```
// DLBL   PRNTOUT,'user print file'
// EXTENT ....
// ASSGN  ...
// EXEC   USERAPPL
// DLBL   PRD2,'VSE'PRD2.LIBRARY'
// EXTENT ,volser
// LIBDEF PHASE,SEARCH=(PRD2.AFP)
// ASSGN  SYSLST,X'FEE'
// ASSGN  SYS006,xxx
// DLBL   INPUT,'your input file',0,SD
// EXTENT SYS006,volser...
// ASSGN  SYS007,xxx
// DLBL   OUTPUT,'your output file',0,SD
// EXTENT SYS007,volser...
// ASSGN  SYS008,xxx
// DLBL   RESOBJ,'your resource output file',0,SD
// EXTENT SYS008,volser...
// ASSGN  SYS009,xxx
// DLBL   INDEX'your index output file',0,SD
// EXTENT SYS009,volser...
// EXEC   PGM=APKACIF
 ACIF parms go here
/*
/&
```

*Figure 12: Sample VSE JCL to run ACIF*

### VSE JCL statements for running ACIF

The statements in Figure 12 on page 18 are explained here. For more information about programming JCL for VSE, see *Print Services Facility/VSE: Application Programming Guide*.

**PRNTOUT**
: Defines the output file that is produced from the application. The application output cannot be spooled to POWER® because ACIF does not read data from the spool. The *user print file* is the name of the print data set created by your application.

**USERAPPL**
: Represents the job step that runs the application that produces the actual print output. The *user application* refers to the program that produces the print file.

**// DLBL PRD2,... // EXTENT ,volser // LIBDEF PHASE,SEARCH=...**
Defines the library or libraries to be searched for the ACIF program and for all the AFP resources (form definitions, page definition, fonts, overlays, and page segments).

**// ASSGN SYSLST,...**
Defines the control statement and error message listing file. The control statement is required or processing stops.

**// ASSGN SYS006,... // DLBL INPUT,... // EXTENT SYS006,...**
Defines the file to be processed by ACIF. In Figure 12 on page 18, this is the same data set as defined by the PRNTOUT file.

**// ASSGN SYS007,... // DLBL OUTPUT,... // EXTENT SYS007,...**
Defines the document file that ACIF creates as a result of processing the application's print file. See OUTPUTDD--VSE for the characteristics of this file.

**// ASSGN SYS008,... // DLBL RESOBJ,... // EXTENT SYS008,...**
Defines the optional file in which ACIF places print resources that are used in processing the application's print file. This file is not required if RESTYPE=NONE is specified in the processing parameter file. For more information about the RESTYPE parameter, see "RESTYPE" on page 60.

**// ASSGN SYS009,... // DLBL INDEX,... // EXTENT SYS009,...**
Defines the optional file in which ACIF places the index object file, if indexing is requested.

This statement is not required:

- Unless indexing is requested or unless the input print file contains indexing structured fields. If you are not sure whether the input print file contains indexing structured fields, and you do not want an index object file that is created, specify `// ASSGN SYS009,IGN`; no index object file is created.
- If INDEXOBJ=NONE is specified in the processing parameter data set and no indexing keywords are specified (FIELD, INDEX, or TRIGGER).

**//EXEC PGM=APKACIF**
Starts the ACIF program. This statement must be followed immediately by ACIF processing parameters.

# Chapter 3. ACIF parameters

This information describes the ACIF parameters, including the syntax rules and values for parameters in z/OS, VM, and VSE operating systems.

Some of the parameters that are specified to ACIF, such as FONTPATH, OBJCPATH, and USERPATH, specify the directory paths where resources are stored. Be sure that those parameters are specified with the same directory paths when you print the job.

**Notes:**

1. For z/OS and VSE, you might need to consult with your system programmer for information about resource library names and other printing defaults that are contained in the PSF startup procedures that are used in your installation.
2. For VM/CMS, you might need to link to the appropriate disks that contain the resource files that are used to convert and print your job.

## Syntax rules for ACIF

These general syntax rules are used for ACIF parameter files:

- Blank characters that are inserted between parameters, values, and symbols are allowed, but ignored. For example, specifying:

  ```
    FORMDEF   =  F1TEMP
        PAGEDEF =    P1PROD
  INDEX1   = FIELD1 , FIELD2 ,    FIELD3
  ```

  is equivalent to specifying:

  ```
  FORMDEF=F1TEMP
  PAGEDEF=P1PROD
  INDEX1=FIELD1,FIELD2,FIELD3
  ```

- When ACIF processes any unrecognized or unsupported parameter, it issues a message, ignores the parameter, and continues processing any remaining parameters until the end of the file, at which time it ends processing.
- If the same parameter is specified more than one time, ACIF uses the last value specified. For example, if these parameters are specified:

  ```
  CPGID=037
  CPGID=395
  ```

  ACIF uses code page 395.
- Comments must be specified by using "/*" as the beginning delimiter. For example:

  ```
  FORMDEF=F1TEMP  /* Temporary FORMDEF
  FORMDEF=F1PROD  /* Production-level FORMDEF
  ```

  Comments can appear anywhere, but ACIF ignores all information in the record that follows the "/*" character string.
- Although ACIF supports parameter values that span multiple records, it does not support multiple parameters in a single record. For example:

  ```
  CHARS=X0GT10 CCTYPE=A  /* This is not allowed.
  ```

In z/OS, VM, and VSE, you enter ACIF parameters in a parameter file. Each parameter with its associated values can span multiple records, but the parameter and the first value must be specified in the same record. If more values need to be specified in the following record, a comma (,) must be specified, following the last value in the previous record. The comma indicates that additional values are specified in one or more of the following records. For example:

**z/OS**

```
FDEFLIB=TEMP.USERLIB,PROD.LIBRARY,
OLD.PROD.LIBRARY    /* These are the FORMDEF libraries.
```

**VM**

```
FDEFLIB=FDEF38PP,
TEMPFDEF             /* These are the FORMDEF libraries.
```

**VSE**

```
INPUTDD=INPUT|filename(LRECL=nnnn,BLKSIZE=nnnn,RECFM=F|FB|V|VB,DEVT=TAPE|DISK)
```

## Parameter values for ACIF

Table 3 on page 22 lists the ACIF parameters and values for the z/OS, VM, and VSE operating systems. Underscored values are the default and are used by ACIF if no other value is specified. Not all parameters are valid in every environment; parameter values are only listed for those operating systems to which they apply.

*Table 3: ACIF parameters and operating systems*

| **ACIF Parameters** | **Operating System** | **See Page...** |
|---|---|---|
| CC={<u>YES</u> \| NO} | z/OS, VM, VSE | “#unique_105/unique_105_Connect_42_ccpdf” on page 31 |
| CCTYPE={Z \| <u>A</u> \| M} | z/OS, VM, VSE | “#unique_83/unique_83_Connect_42_cctypepdf” on page 32 |
| CHARS=*fontname1*[,*fontname2*][,*fontname3*][,*fontname4*] | z/OS, VM, VSE | “#unique_106/unique_106_Connect_42_charspdf” on page 32 |

Table 3: ACIF parameters and operating systems (continued)

| ACIF Parameters | Operating System | See Page... |
|---|---|---|
| COMSETUP=*name* | z/OS, VM | “#unique_108/unique_108_Connect_42_comsetuppdf” on page 34 |
| COLORMAP=*name* | z/OS | “#unique_107/unique_107_Connect_42_colormappdf” on page 33 |
| CPGID={500 \| *codepageid*} | z/OS, VM, VSE | “#unique_109/unique_109_Connect_42_cpgidp” on page 35 |
| DCFPAGENAMES={YES \| NO} | z/OS, VM, VSE | “#unique_110/unique_110_Connect_42_dcfpgpdf” on page 35 |
| DUPLEX={NO \| NORMAL \| YES \| TUMBLE} | z/OS | “#unique_36/unique_36_Connect_42_duplexpdf” on page 35 |
| EXTENSIONS={NONE \| ALL \| [BOX][,CELLED][,EMPTYOK] [,FRACLINE] [,IDXCPGID][,PASSOID][,PASSPF][ , PRCOLOR] [,RESORDER] [,SPCMPRS]} | VM, VSE | “#unique_32/unique_32_Connect_42_extparmpdf” on page 36 |

*Table 3: ACIF parameters and operating systems (continued)*

| **ACIF Parameters** | **Operating System** | **See Page...** |
|---|---|---|
| EXTENSIONS={NONE \| ALL \| [ADDTLE][,BOX][,CELLED] [,EMPTYOK] [,FRACLINE][,IDXCPGID][,MVSICNV][,NOICNV] [,PASSOID][,PASSPF] [,PRCOLOR][,RESORDER][,SPCMPRS]} | z/OS | “#unique_32/unique_32_Connect_42_extparmpdf” on page 36 |
| FDEFLIB=*dsname1*[,*dsname2*][,*dsname3*...] | z/OS | “FDEFLIB=dsname1[,dsname2][,dsname3...]” on page 39 |
| FDEFLIB=*filetype1*[,*filetype2*][,*filetype3*...] | VM | “FDEFLIB=filetype1[,filetype2][,filetype3...]” on page 39 |
| FIELD*n*={*record,column,length*} \| {'*literalvalue*' \| X'*literalvalue*'} | z/OS, VM, VSE | “#unique_113/unique_113_Connect_42_fieldp” on page 40 |
| FONTECH=UNBOUNDED | z/OS, VM, VSE | “#unique_114/unique_114_Connect_42_sfch370p” on page 41 |
| FONTLIB=*dsname1*[,*dsname2*][,*dsname3*...] | z/OS | “FONTLIB=dsname1[,dsname2][,dsname3...]” on page 42 |
| FONTLIB=*filetype1*[,*filetype2*][,*filetype3*...] | VM | “FONTLIB=filetype1[,filetype2][,filetype3...]” on page 42 |

*Table 3: ACIF parameters and operating systems (continued)*

| ACIF Parameters | Operating System | See Page... |
|---|---|---|
| FONTPATH=*pathlist* | z/OS | “FONTPATH=pathlist” on page 43 |
| FORMDEF={*fdefname* \| DUMMY} | z/OS, VM, VSE | “FORMDEF={fdefname \| DUMMY}” on page 43 |
| GROUPNAME={INDEX1 \| INDEX*n*} | z/OS, VM, VSE | “#unique_119/unique_119_Connect_42_groupnp” on page 45 |
| IMAGEOUT={ASIS \| IOCA} | z/OS, VM, VSE | “IMAGEOUT={ASIS \| IOCA}” on page 45 |
| INDEX*n*={'*attributename*' \| X'*attributename*'},{FIELD*n*[,FIELD*n*...]} | z/OS, VM, VSE | “#unique_121/unique_121_Connect_42_indexpdf” on page 45 |
| INDEXDD={INDEX \| *ddname*} | z/OS, VM | “INDEXDD={INDEX \| ddname}” on page 47 |
| INDEXDD={INDEX \| *filename* (DEVT=TAPE \| DISK)} | VSE | “INDEXDD={INDEX \| filename (DEVT=TAPE \| DISK)}” on page 47 |
| INDEXOBJ={GROUP \| ALL \| NONE \| BDTLY} | z/OS, VM, VSE | “#unique_124/unique_124_Connect_42_indexobp” on page 47 |

*Table 3: ACIF parameters and operating systems (continued)*

| **ACIF Parameters** | **Operating System** | **See Page...** |
|---|---|---|
| INDEXSTARTBY={1 \| *nn*} | z/OS, VM, VSE | “#unique_125/unique_125_Connect_42_indexstp” on page 48 |
| INDXEXIT=*modulename* | z/OS, VM, VSE | “#unique_126/unique_126_Connect_42_indxext” on page 48 |
| INPEXIT=*modulename* | z/OS, VM, VSE | “#unique_127/unique_127_Connect_42_inpexit” on page 48 |
| INPUTDD={INPUT \| *ddname*} | z/OS, VM | “INPUTDD={INPUT \| ddname}” on page 49 |
| INPUTDD={INPUT \| *filename* (LRECL=*nnnn*,BLKSIZE=*nnnn*, RECFM=F\|FB\| V\|VB,DEVT=TAPE\|DISK)} | VSE | “INPUTDD={INPUT \| filename (LRECL=nnnn,BLKSIZE=nnnn, RECFM=F\|FB\|V\|VB,DEVT=TAPE \| DISK)}” on page 49 |
| INSERTIMM={YES \| NO} | z/OS, VM, VSE | “#unique_130/unique_130_Connect_42_nsertimmp” on page 49 |

| Table 3: ACIF parameters and operating systems (continued) | | |
|---|---|---|
| **ACIF Parameters** | **Operating System** | **See Page...** |
| LINEOFFSET={ASREAD \| ASPRINTED} | z/OS | "#unique_37/unique_37_Connect_42_lineoffsetp" on page 50 |
| MCF2REF={CPCS \| CF} | z/OS, VM, VSE | "#unique_131/unique_131_Connect_42_mcf2rp" on page 50 |
| MSGDD={SYSPRINT \| *ddname*} | z/OS, VM | "#unique_132/unique_132_Connect_42_msgdd" on page 51 |
| OBJCONLIB=*dsname1*[,*dsname2*][,*dsname3*...] | z/OS | "OBJCONLIB=dsname1[,dsname2][,dsname3...]" on page 51 |
| OBJCONLIB=*filetype1*[,*filetype2*][,*filetype3*...] | VM | "OBJCONLIB=filetype1[,filetype2][,filetype3...]" on page 52 |
| OBJCPATH=*pathlist* | z/OS | "#unique_135/unique_135_Connect_42_objcpathp" on page 52 |
| OUTEXIT=*modulename* | z/OS, VM, VSE | "#unique_136/unique_136_Connect_42_outexit" on page 52 |

*Table 3: ACIF parameters and operating systems (continued)*

| **ACIF Parameters** | **Operating System** | **See Page...** |
|---|---|---|
| OUTPUTDD={OUTPUT \| *ddname*} | z/OS, VM | "OUTPUTDD={OUTPUT \| ddname}" on page 53 |
| OUTPUTDD={OUTPUT \| *filename* (DEVT=TAPE \| DISK)} | VSE | "OUTPUTDD={OUTPUT\| filename (DEVT=TAPE \| DISK)}" on page 53 |
| OVLYLIB=*dsname1*[,*dsname2*][,*dsname3...*] | z/OS | "OVLYLIB=dsname1[,dsname2][,dsname3...]" on page 53 |
| OVLYLIB=*filetype1*[,*filetype2*][,*filetype3...*] | VM | "OVLYLIB=filetype1[,filetype2][,filetype3...]" on page 54 |
| PAGEDEF=*pdefname* | z/OS, VM, VSE | "#unique_140/unique_140_Connect_42_pgdefpdf" on page 54 |
| PARMDD={SYSIN \| *ddname*} | z/OS, VM | "#unique_141/unique_141_Connect_42_parmdd" on page 56 |
| PDEFLIB=*dsname1*[,*dsname2*][,*dsname3...*] | z/OS | "PDEFLIB=dsname1[,dsname2][,dsname3...]" on page 56 |

| Table 3: ACIF parameters and operating systems (continued) | | |
|---|---|---|
| **ACIF Parameters** | **Operating System** | **See Page...** |
| PDEFLIB=*filetype1*[,*filetype2*][,*filetype3*...] | VM | "PDEFLIB =filetype 1[,filetype 2 ] [,filetype3 ...]" on page 56 |
| PRMODE={SOSI1 \| SOSI2 \| SOSI3 \| SOSI4 \| *aaaaaaaa*} | z/OS, VM, VSE | "PRMODE ={SOSI1 \| SOSI2 \| SOSI3 \| SOSI4 \| aaaaaaaa} " on page 57 |
| PSEGLIB=*dsname1*[,*dsname2*][,*dsname3*...] | z/OS | "PSEGLIB =dsname 1[,dsname 2] [,dsname3 ...]" on page 57 |
| PSEGLIB=*filetype1*[,*filetype2*][,*filetype3*...] | VM | "PSEGLIB =filetype 1[,filetype 2] [,filetype3 ...]" on page 58 |
| RESEXIT=*modulename* | z/OS, VM, VSE | "#unique_147/unique_147_Connect_42_resexit" on page 58 |
| RESFILE={<u>SEQ</u> \| PDS} | z/OS | "#unique_148/unique_148_Connect_42_r4370p" on page 59 |
| RESOBJDD={<u>RESOBJ</u> \| *ddname*} | z/OS, VM | "RESOBJ DD={RESO BJ \| ddname}" on page 59 |

*Table 3: ACIF parameters and operating systems (continued)*

| **ACIF Parameters** | **Operating System** | **See Page...** |
|---|---|---|
| RESOBJDD={RESOBJ \| *filename* (DEVT=TAPE \| DISK)} | VSE | "RESOBJDD={RESOBJ \| filename (DEVT=TAPE \| DISK)}" on page 60 |
| RESTYPE={NONE \| ALL \| [FDEF][,PSEG][,OVLY][,FONT][,OBJCON][,BCOCA][,GOCA][,IOCA][,PTOCA][,CMRALL][,CMRGEN][,INLINE][,INLONLY]} | z/OS, VM, VSE | "RESTYPE={NONE \| ALL \| [FDEF][,PSEG][,OVLY][,FONT][,OBJCON][,BCOCA][,GOCA][,IOCA][,PTOCA][,CMRALL][,CMRGEN][,INLINE][,INLONLY]}" on page 60 |
| TRACE={YES \| NO \| PDS} | z/OS | "#unique_151/unique_151_Connect_42_tracep" on page 62 |
| TRACEDD={TRACE \| *ddname*} | z/OS | "#unique_152/unique_152_Connect_42_tracedd" on page 63 |
| TRC={YES \| NO} | z/OS, VM, VSE | "#unique_153/unique_153_Connect_42_trcpdf" on page 63 |

*Table 3: ACIF parameters and operating systems (continued)*

| ACIF Parameters | Operating System | See Page... |
|---|---|---|
| TRIGGERn={*record* \| *},{*column* \| *},{'*triggervalue*' \| X'*triggervalue*'} | z/OS, VM, VSE | “#unique_154/unique_154_Connect_42_triggerpdf” on page 63 |
| UNIQUEBNGS={<u>YES</u> \| NO} | z/OS, VM, VSE | “UNIQUEBNGS={YES \| NO}” on page 65 |
| USERLIB=*dsname1*[,*dsname2*][,*dsname3*...] | z/OS | “USERLIB=dsname1[,dsname2][,dsname3...]” on page 65 |
| USERLIB=*filetype1*[,*filetype2*][,*filetype3*...] | VM | “USERLIB=filetype1[,filetype2][,filetype3...]” on page 65 |
| USERPATH=*pathlist* | z/OS | “USERPATH=pathlist” on page 66 |

The following information describes the ACIF parameters. The format and usage is the same in all environments (z/OS, VM, and VSE) unless otherwise specified.

## CC

Specifies whether the input file has carriage control characters. Carriage control characters, if present, are in the first byte (column) of each line in a document. They are used to control how the line is formatted (single space, double space, triple space, and so forth). In addition, other carriage control characters can be used to position the line anywhere on the page. If carriage control characters are not present, single spacing is assumed.

**CC={<u>YES</u> | NO}**
The values are:

**YES**
The file contains carriage control characters.

**NO**
The file does not contain carriage control characters.

If this parameter is not specified, ACIF assumes that the file contains carriage control characters.

## CCTYPE

Specifies the type of carriage control characters in the input file. ACIF supports ANSI carriage control characters in either ASCII or EBCDIC encoding, and machine carriage control characters. ACIF does not allow a mixture of ANSI and machine carriage control characters within a file.

**CCTYPE=Z | A | M**

The values are:

**Z**

The file contains ANSI carriage control characters that are encoded in ASCII.

The carriage control characters are the ASCII hexadecimal values that directly relate to ANSI carriage controls, which cause the action of the carriage control character to occur *before* the line is printed. For example, if the carriage control character is zero (X'30'), which represents double spacing, double spacing occurs *before* the line is printed.

**A**

The file contains ANSI carriage control characters that are encoded in EBCDIC.

The use of ANSI carriage control characters cause the action of the carriage control character to occur *before* the line of data is printed. For example, if the carriage control character is a zero (X'F0'), which represents double spacing, the double spacing occurs *before* the line is printed.

**M**

The file contains machine code carriage control characters that are encoded in hexadecimal format.

The use of machine code carriage control characters cause the action of the carriage control character to occur *after* the line of data is printed. For example, if the carriage control character is a X'11', which represents double spacing, the line is printed and the double spacing occurs *after* the line is printed. In addition, machine code carriage control has a set of carriage control characters that perform the action, but do not print the associated line. For example, if the carriage control character is a X'13', which also represents double spacing, the print position is moved down two lines but the line that contains the X'13' carriage control character is not printed. The next line in the data is printed at the current print position and the action for the associated carriage control character is performed *after* the line is printed.

If you specify CC=YES but you do not specify CCTYPE, ACIF assumes that the file contains ANSI carriage control characters that are encoded in EBCDIC.

If you are not sure which type of carriage control characters are in your input file, consult your system support group. For more information, see "Understanding how ANSI and machine carriage controls are used" on page 208.

## CHARS

Specifies the file name (in VM) or the member name (in z/OS or VSE) of from 1 - 4 coded fonts that you want ACIF to use to process a file. A coded font specifies a character set and code page pair.

**Note:** The CHARS parameter is ignored if you specify the FONTPATH or USERPATH parameter for TrueType and OpenType fonts.

**CHARS=*fontname1*[,*fontname2*][,*fontname3*][,*fontname4*]**

The value is:

***fontname***

The name of the coded font. The name is limited to four characters, consisting of any combination of alphanumeric characters (a-z, A-Z, 0–9) and special characters (# $ @). It does not include the 2-character prefix of the coded-font name (X0 through XG).

Use CHARS to specify coded fonts in a font library that has names of six or fewer characters (including the prefix). You can rename any fonts that have more than six characters or use a text editor to create new coded fonts for use with the CHARS parameter.

When ACIF is used to convert traditional line data or mixed-mode data, you must specify a page definition with the PAGEDEF parameter. You can then specify the fonts either in the page definition or with the CHARS parameter, but not both. You cannot mix fonts that are specified in a page definition with fonts specified with CHARS for a single file. If you use CHARS to specify fonts, but you also use the PAGEDEF parameter to specify a page definition that names fonts, the CHARS parameter is ignored. Therefore, if your page definition names fonts, do not use the CHARS parameter.

Select fonts with table-reference characters (TRCs), with AFP structured fields, or in a page definition. If the page definition does not name any fonts, and you want to specify more than one font with the CHARS parameter, you must specify table reference characters (TRCs) in the input file to select the fonts. For example, if you want the file to print with these two fonts, X0GT10 (Gothic 10 pitch) and X0GT12 (Gothic 12 pitch), do these tasks:

1. Specify TRC=YES.
2. Use CHARS to associate the fonts with each TRC:

   ```
   CHARS=GT10,GT12
   ```

   where, GT10 is associated with TRC 0 and GT12 is associated with TRC 1.

If the page definition does not name any fonts, and you want the whole file to print with only one font, you must do these tasks:

1. Specify TRC=NO.
2. Use CHARS to indicate the single font in which the file must be printed. For example:

   ```
   CHARS=GT10
   ```

You can specify fonts in the CHARS parameter only if you want the entire file printed in a single printing direction. ACIF uses the fonts that have 0° character rotation for the specified direction. When a file requires fonts with more than one printing direction or character rotation, you must specify the fonts in the page definition.

If you do not specify a CHARS parameter, and if no fonts are contained in the page definition you specified, ACIF uses the printer default font.

**z/OS and VM**

In z/OS and VM, fonts you specify must be either in a library that is specified with the FONTLIB parameter or in a user library specified with the USERLIB parameter.

**VSE**

In VSE, you must specify fonts in the `// LIBDEF PHASE, SEARCH=(…)` JCL statement.

## COLORMAP

Specifies the name of a color mapping table resource in z/OS. A color mapping table is an AFP resource that is used to map color values that are specified in a source color space to color values specified in a target color space. This parameter is not used for VM and VSE.

**COLORMAP=*name***
The value is:

***name***
Any valid member name for the color mapping table. The name can be 1 - 8 alphanumeric characters (a-z, A-Z, 0–9) and special characters (# $ @), including the 2-character prefix, if there is one.

You can create your own color mapping table by using the Color Mapping Tool that is included with PSF for z/OS (see *PSF for z/OS: User's Guide*), or you can use an existing resource that is created by your system programmer.

The color mapping table that is specified on the COLORMAP parameter can be found in these locations:

- In a z/OS library that is referenced by the USERLIB or OBJCONLIB parameter.
- Inline in the file or print data set.

A color mapping table can be an inline resource in all data formats except XML. If the color mapping table is an inline resource, you must specify one of these parameters:

**COLORMAP=*name***
*name* is the name of the inline color mapping table. If the name specified in the COLORMAP parameter does not match the name of an inline color mapping table, ACIF looks for the color mapping table in the OBJCONLIB or USERLIB library.

**COLORMAP=DUMMY**
If you specify COLORMAP=DUMMY but the file does not include an inline color mapping table, ACIF looks for a color mapping table that is named DUMMY in the OBJCONLIB or USERLIB library.

An input file can contain multiple color mapping tables, but only one can be used for printing. If a file contains more than one color mapping table and you specify COLORMAP=*name*, ACIF uses the first inline color mapping table named *name*. If a file contains more than one inline color mapping table and you specify COLORMAP=DUMMY, ACIF uses the first inline color mapping table in the input file.

## COMSETUP

Specifies the name of a COM setup file in z/OS and VM. A COM setup file is an AFP resource that contains instructions that are required when printing on a microfilm device (*microfilm* can mean either microfiche or 16 mm film). This parameter is not used for VSE.

**COMSETUP=*name***
The value is:

***name***
Any valid COM setup file name (in VM) or member name (in z/OS). The *name* can be 1 - 8 alphanumeric characters (a-z, A-Z, 0–9) and special characters (# $ @), including the 2-character prefix, if there is one.

**Note:** If the name of the COM setup file includes a file extension, do not use the file extension when you are specifying the setup file. For example, to use a setup file that is named MYSETUP.SET, specify COMSETUP=MYSETUP.

The COM setup file that you use can be located:

- In a z/OS or VM library.
- Inline in the file (that is, within the file itself).

If the COM setup file is in a z/OS or VM library, use the USERLIB or OBJCONLIB parameter to specify the path to the file or the data set.

In z/OS or VM, use one of these examples:

```
COMSETUP=MYSETUP
USERLIB=USER.RESOURCES
```

```
COMSETUP=MYSETUP
OBJCONLIB=USER.SETUPS
```

A COM setup file can be an inline resource in all data formats except XML. (XML data cannot have carriage control characters, which are used to identify inline resources.) If the COM setup file is an inline resource, you must specify one of these parameters:

**COMSETUP=*name***
*name* is the name of the inline COM setup file. If the name specified in the COMSETUP parameter does not match the name of an inline COM setup file, ACIF looks for the COM setup file in the COMSETUP search path.

**COMSETUP=DUMMY**
If you specify COMSETUP=DUMMY but the file does not include an inline COM setup file, ACIF looks for the COM setup file named DUMMY.

An input file can contain multiple COM setup files, but only one COM setup file can be used for printing. If a file contains more than one COM setup file, and you specify COMSETUP=*name*, ACIF uses the first inline COM setup file named *name*. If a file contains more than one inline COM setup file, and you specify COMSETUP=DUMMY, ACIF uses the first inline COM setup file in the input file.

## CPGID

Specifies the 3 - 4 digit identifier that defines an IBM-registered code page that is used when the index values and attribute names are specified on the INDEX*n* and FIELD*n* parameters.

**CPGID={<u>500</u> | *codepageid*}**
The values are:

**500**
IBM code page 500.

***codepageid***
Any valid code page, which is a 3 - 4 character decimal value (for example, 395) that defines an IBM-registered code page.

If this parameter is not specified, ACIF uses code page 500 as the default.

ACIF uses the code page identifier value when it creates a Coded Graphic Character Set Global Identifier Triplet X'01' in the Begin Document (BDT) structured field for the output file. For more information about this triplet, see *Mixed Object Document Content Architecture Reference*.

The code page identifier is used by programs, such as AFP Workbench Viewer, that must display indexing information. These programs use this identifier with code page translation tables to represent the index attribute and value data. For code page numbers less than 100, add leading zeros (for example, 037). If a non-decimal value is specified, ACIF reports an error condition and ends processing. For more information about code pages, see *IBM AFP Fonts: Technical Reference for Code Pages*.

If your input file contains Unicode data and you specify EXTENSIONS=IDXCPGID to process the code page identifiers, see "Indexing considerations" on page 210 for more information about using the CPGID parameter.

## DCFPAGENAMES

Specifies whether ACIF generates page names by using either an 8-byte counter or structured field tokens that are found in the input data stream. If the input data contains Begin Page (BPG) structured fields with fully qualified names (FQNs), ACIF does not generate page names.

**DCFPAGENAMES={YES | <u>NO</u>}**
The values are:

**YES**
ACIF uses structured field tokens in the input data stream to generate page names.

**NO**
ACIF generates page names by using an 8-byte counter.

If this parameter is not specified, ACIF generates page names by using an 8-byte counter.

## DUPLEX

Specifies whether the duplex value is used or overridden in a form definition. No default value exists; instead, if the parameter is not specified, ACIF uses the form definition duplex value.

**DUPLEX=NO | NORMAL | YES | TUMBLE**

The values are:

**NO**
Printing is done only on the front side of the sheet.

**NORMAL**
Printing is done on both sides of the sheet so the sheets can be bound on the long edge of the paper.

**YES**
Printing is done on both sides of the sheet so the sheets can be bound on the long edge of the paper.

**TUMBLE**
Printing is done on both sides of the sheet so the sheets can be bound on the short edge of the paper.

## EXTENSIONS

Specifies the extended options that ACIF uses. Extensions are MO:DCA-P data stream advanced features that might not be supported for all presentation devices. You must use care when you are choosing these options to ensure that they are supported by your print server, viewer, or printer. In PSF for z/OS, you can use the display printer information function to see the supported functions for your printer. For more information, see *PSF for z/OS: Customization*.

**EXTENSIONS={NONE | ALL | [ADDTLE][,BOX][,CELLED][,EMPTYOK][,FRACLINE][,IDXCPGID][,MVSICNV][,NOICNV][,PASSOID][,PASSPF][,PRCOLOR][,RESORDER][,SPCMPRS]}**
The values are:

**NONE**
ACIF does not use any extended options.

**ALL**
ACIF uses all extended options.

**Be careful:**

1. Many options apply only to specific data; for example, IDXCPGID applies only to line data. Therefore, when you specify ALL, make sure that all of the options apply to your data. For best results, specify only the extended options that apply to the specific type of data you are using.
2. More options might be added in the future that might not be supported by your presentation device.

**ADDTLE**
ACIF adds group Tag Logical Element (TLE) structured fields to the output and index files when the input file is fully composed AFP. The TLE attribute name is specified as an INDEX parameter, and the TLE attribute value is specified as a FIELD parameter that contains a constant value. With the definitions in the following example, ACIF adds one TLE with an attribute name of "DEPT" and a value of "111", and another TLE with an attribute name of "CODE" and a value of "R7". The TLEs are added to each group.

```
CC=YES
CCTYPE=A
CPGID=500
FORMDEF=F1A10110
EXTENSIONS=ADDTLE
RESTYPE=FDEF,PSEG,OVLY
FIELD1=X'F1F1F1'
INDEX1=X'C4C5D7E3',FIELD1
FIELD2=X'D9F7'
INDEX2=X'C3D6C4C5',FIELD2
```

**Notes:**

1. The index name and value must be encoded in the correct code page.
2. The input must be AFP that contains BNG/ENG pairs.
3. No TRIGGER parameters can be specified with ADDTLE.

4. By default, ACIF uses the value of INDEX1 for the GROUPNAME. INDEX1 must be defined or the GROUPNAME parameter must be specified to indicate which of the constant fields ACIF should use for the GROUPNAME. For example:

```
CC=YES
CCTYPE=A
CPGID=500
FORMDEF=F1A10110
EXTENSIONS=ADDTLE
RESTYPE=FDEF,PSEG,OVLY
FIELD3=X'F1F1F1'
INDEX3=X'C4C5D7E3',FIELD3
GROUPNAME=INDEX3
```

**BOX**
Specifies that GOCA box drawing orders are supported. This option is required when you are using the DRAWGRAPHIC command in a record formatting page definition. See "Drawing graphics with record format page definitions" on page 83 for an example of using this option.

**CELLED**
Specifies the IOCA Replicate and Trim function when you are converting IM1 celled images. This option might reduce the number of bytes needed for a raster image, and it might display or print faster. It requires that IMAGEOUT=IOCA is specified (the default).

**EMPTYOK**

When a job requests indexing, indicates that if the input file that is specified with the INPUTDD parameter is empty, ACIF ignores the indexing request, issues message APK422S with return code 64, and ends processing with RC=0. ACIF does not issue message APK448S when the indexing request is not successful and does not produce a resource file.

**FRACLINE**
Specifies that GOCA fractional line width drawing orders are supported. This option is required when you are using the DRAWGRAPHIC command in a record formatting page definition. See "Drawing graphics with record format page definitions" on page 83 for an example of using this option.

**IDXCPGID**
Specifies that ACIF processes code page identifiers for these Unicode code pages:

**1200**
UTF-16 BE

**1208**
UTF-8

**13488**
UTF-16 BE

**17584**
UTF-16 BE

**Notes:**

1. This value is used only with line data, not MO:DCA-P or mixed-mode data.
2. ACIF issues an error message if IDXCPGID is specified with the PASSPF parameter. If EXTENSIONS=ALL is specified, PASSPF is ignored and IDXCPGID is used.

See "Indexing considerations" on page 210 for information about using the CPGID parameter when you are processing code page identifiers for Unicode data.

**MVSICNV**
Specifies that ACIF initializes the CEEPIPI environment to enable the ICONV translation services on MVS™ and regular expressions. This parameter is only valid in z/OS and is required if:

- The page definition specifies Quick Response (QR) Code bar codes and the line data contains DBCS characters.
- The page definition uses the VARIABLE option when resource objects are specified.

- The data contains PTOCA objects.
- Regular expressions are used for field or trigger searches.

See "Enabling ICONV translation services and regular expressions" on page 16 for the steps you must do before you specify MVSICNV.

When you specify the USERPATH, FONTPATH, or OBJCPATH parameter to request color management or TrueType and OpenType font support, MVSICNV is the default.

**NOICNV**
Specifies that ACIF does not initialize the CEEPIPI environment to enable the ICONV translation services on MVS. This parameter is only valid in z/OS.

NOICNV is the default unless you specify the USERPATH, FONTPATH, or OBJCPATH parameter to request color management or TrueType and OpenType font support.

**PASSOID**
Specifies that ACIF passes OID information from the resource access table (RAT) to the Begin Resource (BRS or BR) structured field when it is saving TrueType and OpenType fonts. For more information about the RAT, see *Using OpenType Fonts in an AFP System*.

**PASSPF**
Specifies that ACIF passes the Begin Print File (BPF) and End Print File (EPF) structured fields, which define the boundaries of the print data, to the output file when they are found in the input file. If this value is not specified, ACIF discards the BPF/EPF pair.

This parameter also controls whether a BPF/EPF structured field pair that the input record exit tries to insert is inserted. If this value is not specified, and the input record tries to insert a BPF/EPF pair, the attempt fails, and the pair is discarded.

**Notes:**

1. Be careful when you are using PASSPF. If the output file contains BPF and EPF structured fields and it is concatenated with the resource file, the resulting MO:DCA-P data stream is not valid.
2. This value is not used when the input file is line data because line data does not contain BPF and EPF structured fields.
3. When PASSPF is specified and the input file contains a BPF and EPF structured field pair, ACIF passes all Begin Document (BDT) and End Document (EDT) structured field pairs from the MO:DCA-P input file to the output data stream without adding the normal comment and time stamp triplets.
4. ACIF issues an error message if PASSPF is specified with the IDXCPGID parameter. If EXTENSIONS=ALL is specified, PASSPF is ignored and IDXCPGID is used.
5. ACIF does not verify whether the input file is MO:DCA interchange set compliant.

For more information about BPF and EPF structured fields, see "Begin Print File (BPF) and End Print File (EPF) structured fields" on page 222.

**PRCOLOR**
Specifies that GOCA process color drawing orders are supported. This option is required when you are using the DRAWGRAPHIC command in a record format page definition. See "Drawing graphics with record format page definitions" on page 83 for an example of using this option.

**RESORDER**
Specifies that inline resources do not need to appear in any particular order in the input file; only before the Begin Document (BDT) structured field. When RESORDER is not specified, inline resources must appear in the input file in the order in which they are used. For example, if a coded font is inline, the character set and code page that the coded font points to must occur inline first. When RESORDER is specified, ACIF reads all the inline resources into memory, and then determines which ones are needed to print the job. Only those resources that are needed are written to the resource file. Inline resources that are not needed are not saved in the resource file. Because ACIF reads all the inline resources into memory, this option can cause ACIF to run out of memory.

**Keep in mind:**

1. When RESORDER is specified, TrueType and OpenType fonts that were originally inline in the input file are not saved in the resource library.
2. Specifying RESORDER impacts performance and storage use.

**SPCMPRS**
Specifies the repeat string PTOCA order to compress embedded blanks.

## FDEFLIB

Specifies the location of form definitions. This parameter is not used for VSE.

### z/OS

**FDEFLIB=*dsname1*[,*dsname2*][,*dsname3*...]**
Specifies the data sets that compose the form definition library. You can specify a maximum of 16 data sets. For example:

```
FDEFLIB=SYS1.FDEFLIB,USER.FDEFLIB
```

This parameter also specifies the concatenation sequence when ACIF searches for a particular form definition. ACIF first looks for the resource in *dsname1*. If it cannot find the resource in *dsname1*, it continues the search with *dsname2*, and so on, until it locates the requested resource or exhausts the list of specified data sets.

If USERLIB is also specified, ACIF searches for the resource in the data sets specified in USERLIB before it searches the data sets identified in FDEFLIB.

**Notes:**

1. Data sets must be specified as fully qualified names without quotation marks.
2. If the libraries specified for FORMDEF are not specified in the same order that is used by the PSF startup procedure, the printed and converted results might differ. For information about how PSF selects resources, see *PSF for z/OS: Customization*.
3. For systems before MVS/DFP Version 2.3, data sets must be concatenated with the largest block size first.
4. FDEFLIB is a required parameter if USERLIB is not specified. If FDEFLIB is not specified, ACIF reports an error condition and ends processing.

### VM

**FDEFLIB=*filetype1*[,*filetype2*][,*filetype3*...]**
Specifies the file types that define the form definition libraries. You can specify a maximum of eight file types. For example:

```
FDEFLIB=FDEF38PP,TEMPFDEF
```

This parameter also specifies the search order in which ACIF searches for a particular form definition. ACIF first looks for the resource with a file type of *filetype1*. If it cannot find the resource with a file type of *filetype1*, it continues the search with *filetype2*, and so on, until it locates the requested resource or exhausts the list of specified file types.

**Notes:**

1. File type values must conform to CMS naming conventions.
2. FDEFLIB is a required parameter if USERLIB is not specified. If FDEFLIB is not specified, ACIF reports an error condition and ends processing.

**VSE**

This parameter is not used for VSE. Form-definition resources are in the library that is defined by the `// LIBDEF PHASE,SEARCH=(…)` JCL statement. For information about how PSF/VSE selects resources, see *Print Services Facility/VSE: System Programming Guide*.

## FIELDn

Specifies the data fields to be used to construct the indexing information. These data fields can be specified as literal values (constants) or ACIF can retrieve the data from the input records of the file. You can define a maximum of 16 fields (FIELD1 through FIELD16).

**FIELD*n*={*record*,*column*,*length*} | {'*literal value*' | X'*literal value*'}**

The values are:

***record***

Specifies the relative record number from the indexing anchor record. When ACIF is indexing the file, it uses the information that is specified in the TRIGGER*n* parameter to determine a page-group boundary. When all of the specified TRIGGER*n* values are true, ACIF defines the indexing anchor record as the record where TRIGGER1 is located. TRIGGER1 becomes the reference point from which all indexing information is located. The supported range of values for *record* are ±0 to 255.

***column***

Specifies the byte offset from the beginning of the record. A value of "1" refers to the first byte in the record. For files that contain carriage control characters, column 1 refers to the carriage control. For those applications that use a specific carriage control character to define page boundaries (for example, skip to channel 1), consider defining the value of the carriage control character as one of the TRIGGER*n* parameters. The supported range of values for *column* are 1 - 32756. If the specified value exceeds the physical length of the record, ACIF reports an error condition and ends processing.

***length***

Specifies the number of contiguous bytes (characters), starting at *column*, that composes this field. The supported range of values for *length* are 1 - 250.

The field can extend outside the record length, if the column where it begins lies within the record length. In this case, ACIF adds padding blanks (X'40') to complete the record. If the field begins outside the maximum length of the record, ACIF reports an error condition and ends processing.

***literal value* | X'*literal value*'**

Specifies the literal (constant) value of the FIELD*n* parameter. The literal value can be 1 - 250 bytes (one hexadecimal literal value equals 2 bytes). ACIF does not do any validity checking on the actual content of the supplied data.

**Note:** The literal value can be specified as EBCDIC character data or hexadecimal data. However, if the input data file is *anything other than* EBCDIC, the value *must* be specified as hexadecimal data (otherwise, the comparisons between the input data file and what is coded in the FIELD*n* parameter do not yield a match).

For example, to specify five fields in your print job, you can enter:

- `FIELD1=0,2,20`
- `FIELD2=5,5,10`
- `FIELD3=-15,30,5`
- `FIELD4='444663821'`
- `FIELD5=X'0001'`

In the example, the fields have these values:

- The first field is in the indexing anchor record (TRIGGER1). The field is 20 bytes, starting at the second byte of the record.

- The second field is located five records down from the indexing anchor record. The field is 10 bytes, starting at the fifth byte of the record.
- The third field is located 15 records before the indexing anchor record. It is 5 bytes, starting at byte 30.
- The fourth and fifth fields are literal (constant) values. The fourth field is specified as character data; the fifth field is specified as hexadecimal data.

For more information about using literal values or data values for indexing, see “Indexing with literal values” on page 5 and “Indexing with data values” on page 5.

**Notes:**

1. ACIF allows fields to be defined but never referenced as part of an index. Because ACIF requires either a field or TRIGGER to appear on the first page of a logical document, unless the INDEXSTARTBY parameter is used, you can satisfy this requirement by defining a "DUMMY" field. ACIF uses the DUMMY field to determine the beginning page of a logical document, but it is not used as part of an index. If you specify the INDEXSTARTBY parameter, start counting on the first page on which you have a valid field, not a DUMMY field.
2. ACIF requires that at least one TRIGGER*n* or FIELD*n* value appear within the page range that is specified by the INDEXSTARTBY parameter (unless INDEXSTARTBY=0 is specified). If no TRIGGER*n* or FIELD*n* parameter is satisfied within the INDEXSTARTBY page range, ACIF stops processing and issues an error message. If you do not want ACIF to stop processing when it cannot find a group indexing field or when a file is empty, you must set the parameter to INDEXSTARTBY=0 or specify EXTENSIONS=EMPTYOK.
3. At least one TRIGGER*n* or FIELD*n* value must exist on the first page of every unique page group. ACIF cannot detect an error condition if TRIGGER*n* or FIELD*n* is missing, but the output might be incorrectly indexed.

See Chapter 4, “Enhanced indexing parameters,” on page 67 for information about using the FIELD*n* parameter with enhanced ACIF indexing.

## FONTECH

Indicates that ACIF processes 3800 (unbounded box) fonts.

**Note:** The FONTECH parameter must be used with caution. Unbounded fonts are supported only by the IBM 3800 printer. They are not supported by any other printer or the AFP Workbench Viewer. Any resource object file that is archived has limited use.

**FONTECH=UNBOUNDED**

Indicates that ACIF processes 3800 (unbounded box) fonts. Any value other than UNBOUNDED causes ACIF to issue an error message and end processing.

If you specify FONTECH=UNBOUNDED and RESTYPE=FONT or RESTYPE=ALL, ACIF reads unbounded box fonts and saves them in the resource object data set. However, the syntax of the unbounded box fonts is not checked. If errors are present in the AFP data stream that makes up the font, ACIF does not issue an error message.

You cannot mix unbounded box fonts and TrueType or OpenType fonts in the same document. Therefore, if you specify FONTPATH and USERPATH, ACIF ignores them when FONTECH=UNBOUNDED is specified.

## FONTLIB

Specifies the location of FOCA fonts, including AFP extended code page fonts. AFP extended code page fonts contain EBCDIC or ASCII encodings and can contain the Unicode equivalent value. AFP extended code page fonts have a .ECP file extension. FONTLIB is not used to specify directories for TrueType and OpenType fonts. Instead, use the FONTPATH or USERPATH parameter. This parameter is not used for VSE.

**Note:** ACIF assumes that FOCA fonts are named according to the suggested IBM naming conventions in Table 7 on page 233. If the naming conventions are not followed, you might get unexpected results, such as a character rotation that you do not expect.

**z/OS**

**FONTLIB=*dsname1*[,*dsname2*][,*dsname3*...]**

Specifies the data sets that contain the FOCA fonts. You can specify a maximum of 16 data sets. For example:

```
FONTLIB=SYS1.FONTLIB,USER.FONTLIB
```

This parameter also specifies the concatenation sequence when ACIF searches for a particular font resource. ACIF first looks for the resource in *dsname1*. If it cannot find the resource in *dsname1*, it continues the search with *dsname2*, and so on, until it either locates the requested resource or exhausts the list of specified data sets.

If USERLIB is also specified, ACIF searches for the resource in the data sets specified in USERLIB before it searches the data sets identified in FONTLIB.

**Notes:**

1. Data sets must be specified as fully qualified names without quotation marks.
2. If the libraries specified for FONTLIB are not specified in the same order that is used by the PSF startup procedure, the printed and converted results might differ. For information about how PSF selects resources, see *PSF for z/OS: Customization*.
3. For systems before MVS/DFP Version 2.3, data sets must be concatenated with the largest block size first.
4. This parameter is required if font retrieval is requested and USERLIB is not specified, or if MCF2REF=CPCS and any coded fonts are referenced in the input file or in an overlay. The RESTYPE parameter determines whether fonts are to be retrieved for inclusion in the resource data set. If this parameter is not specified, and font retrieval is requested or a coded font is referenced, ACIF reports an error condition and ends processing.

**VM**

**FONTLIB=*filetype1*[,*filetype2*][,*filetype3*...]**

Specifies the file types that define the FOCA raster or outline font libraries. If your page definition or AFP input file refers to outline fonts on the Map Coded Font (MCF) structured fields, include an outline font library in the search order.

You can specify a maximum of eight file types. For example:

```
FONTLIB=FONT3820,TESTFONT
```

This parameter also specifies the search order when ACIF searches for a particular font resource. ACIF first looks for the resource in *filetype1*. If ACIF cannot find the resource with a file type of *filetype1*, it continues the search with *filetype2*, and so on, until it either locates the requested resource or exhausts the list of specified file types.

**Notes:**

1. File type values must conform to CMS naming conventions.
2. This parameter is required if font retrieval is requested and USERLIB is not specified, or if MCF2REF=CPCS and any coded fonts are referenced in the print file or in an overlay. The RESTYPE parameter determines whether fonts are to be retrieved for inclusion in the resource file. If this parameter is not specified, and font retrieval is requested or a coded font is referenced, ACIF reports an error condition and ends processing.

**VSE**

This parameter is not used for VSE. Font resources are in the library that is defined by the `// LIBDEF PHASE,SEARCH=(…)` JCL statement. For information about how PSF/VSE selects resources, see *Print Services Facility/VSE: System Programming Guide*.

## FONTPATH

Specifies the system font path library directories in which TrueType and OpenType fonts and AFP extended code page fonts are stored. TrueType and OpenType fonts are Unicode-enabled AFP fonts that are not defined by FOCA. AFP extended code page fonts are FOCA fonts that contain EBCDIC or ASCII encodings and can contain the Unicode equivalent value. AFP extended code page fonts have a .ECP file extension. This parameter is not supported for VM and VSE; if specified, you see an error message.

**FONTPATH=*pathlist***

The value is:

***pathlist***

Any valid search path. You must use a colon (:) to separate multiple paths. For example:

```
INPUTDD=INFILE
OUTPUTDD=OUTFILE
PAGEDEF=PAGTRUE
FORMDEF=F1A10110
FONTPATH='/u/fonts/truetype:/u/fonts/truetype/local/'
```

**Note:** To continue a *pathlist* on multiple lines in a parameter file, type the *pathlist* to the last character of the first line and then continue typing in the first column of the next line.

ACIF searches the paths in the order in which they are specified.

**Keep in mind:** The total number of all characters in the string of path names cannot exceed 4095 bytes.

For more information about how ACIF processes resources such as TrueType and OpenType fonts, see Appendix B, "Processing resources installed with resource access tables," on page 217.

## FORMDEF

Specifies the file name (in VM) or the member name (in z/OS or VSE) of the form definition. A form definition defines how a page of data is placed on a form, the number of copies of a page, any modifications to that group of copies, the paper source, and duplexing. ACIF uses a form definition only at print time to retrieve resources; it does not use a form definition at transform time to convert data streams.

**FORMDEF={*fdefname* | DUMMY}**

The values are:

***fdefname***

Any valid form definition name. The *fdefname* can be 1 - 8 alphanumeric characters (a-z, A-Z, 0–9) and special characters (# $ @), including the 2-character prefix, if there is one. Unlike PSF for z/OS, PSF/VM, and PSF/VSE, ACIF does *not* require the name to begin with an F1 prefix; however, if the name does begin with F1, you cannot omit it. For example:

```
   FORMDEF=F1USER10
```

**Notes:**

1. If the file name of the form definition includes a file extension, do not use the file extension when you are specifying the form definition. For example, to use a form definition that is named `MEMO.FDEF38PP`, specify FORMDEF=MEMO.

**DUMMY**

ACIF requires a form definition to process the input file (even though the form definition is only used at print time). If you do not specify FORMDEF, the default is DUMMY, which indicates that

ACIF uses the first inline form definition. If ACIF cannot find an inline form definition, it reports an error and ends processing.

If you specify FORMDEF=DUMMY but the file does not include an inline form definition, ACIF looks for a form definition named DUMMY. If ACIF cannot find a form definition that is named DUMMY, it reports an error and ends processing.

**Note:** DUMMY must be specified in all uppercase letters.

The form definition that you use can be found in one of these locations:

**Inline in the file**

A form definition can be an inline resource in all data formats except XML. (XML data cannot have carriage control characters, which are used to identify inline resources.) If the form definition is an inline resource, you must do these tasks:

1. Include an inline form definition in the file.
2. Specify CC=YES to indicate that the file contains carriage control characters. If the length of the records in the form definition is less than or equal to the logical-record length defined for the file, you can specify fixed-length records for the record format. If the length of the records in the form definition is greater than the logical-record length defined for the file, you must specify:
    - Variable length records in z/OS or VSE for the record format (variable blocked with ANSI carriage control characters [VBA] or variable blocked with machine carriage control characters [VBM])
    - Variable length records in VM for the record format
3. Specify FORMDEF with one of these values:

    ***fdefname***

    The name of an inline form definition. If the name specified in the FORMDEF parameter does not match the name of an inline form definition, ACIF looks for the form definition in a USERLIB or FDEFLIB path, or a VSE library.

    **DUMMY**

    If the file does not include an inline form definition, ACIF looks for the form definition named DUMMY. If ACIF cannot find a form definition that is named DUMMY, it reports an error and ends processing.

    **Note:** DUMMY must be specified in all uppercase letters.

An input file can contain multiple form definitions, but only one form definition can be used for printing. If a file contains more than one inline form definition, and you specify FORMDEF=*fdefname*, ACIF uses the first inline form definition named *fdefname*. If a file contains more than one inline form definition and you specify FORMDEF=DUMMY, ACIF uses the first inline form definition in the input file. By changing the form definition name in the FORMDEF parameter on different printing jobs, you can test different form definitions.

**z/OS or VM library**

Use the USERLIB or FDEFLIB parameter to specify the path to the file or the data sets. For example:

```
FORMDEF=MEMO
USERLIB=USER.RESOURCES
```

```
FORMDEF=MEMO
FDEFLIB=USER.FORMDEFNS
```

**VSE library**

The `// LIBDEF PHASE,SEARCH=(…) DLBL` JCL statement references the VSE library.

## GROUPNAME

Specifies which of the eight possible INDEX values are used as the group name for each index group. Using a unique index value for the group name is suggested. The intent is to have a unique group name for every group ACIF produces in the output file. The value includes the FIELD definitions from the INDEX parameter but not the attribute name. ACIF uses this parameter only when the file is indexed. The AFP Workbench Viewer displays this value along with the attribute name and index value. You can use the group name to select a group of pages to be viewed.

**GROUPNAME={INDEX1 | INDEX*n*}**
The values are:

**INDEX1**
ACIF uses the value of INDEX1 for the group name.

**INDEX*n***
ACIF uses the value of the specified INDEX (INDEX1, INDEX2, INDEX3,...INDEX8) for the group name.

If GROUPNAME is not specified, ACIF uses INDEX1 as the default.

See Chapter 4, "Enhanced indexing parameters," on page 67 for information about using group indexes and triggers with enhanced ACIF indexing.

## IMAGEOUT

Specifies the format in which ACIF saves IM1 image data in the output document. IM1 images can be saved as they are in the input file or converted to uncompressed Image Object Content Architecture (IOCA) images.

Most printers support both IM1 and IOCA image formats, but IM1 images cannot be rotated or rescaled correctly at different printer resolutions. Print servers, such as PSF, convert IM1 images to uncompressed IOCA when the IM1 image resolution differs from the actual printer resolution. Because ACIF does not know what printer the output might be printed on, by default it converts IM1 images to uncompressed IOCA.

Because uncompressed IOCA images are often greater in size than the original IM1 images, printer performance can be slower. If you have problems with printer performance, specify IMAGEOUT=ASIS so the IM1 images are not converted to IOCA. Also, if you are using the VSE operating system, specify IMAGEOUT=ASIS to avoid out-of-storage conditions.

**IMAGEOUT={ASIS | IOCA}**
The values are:

**ASIS**
Specifies that ACIF produce all IM1 image data in the same format as in the input file. Use this value when you are archiving or viewing images, for better printer performance, or when you are using VSE.

**IOCA**
Specifies that ACIF produce all IM1 image data in uncompressed IOCA format.

If IMAGEOUT is not specified, ACIF uses IOCA as the default.

## INDEXn

Specifies the content of the indexing tags for the entire file. A maximum of eight indexes can be defined (INDEX1, INDEX2,... INDEX8) and each index can be made up of one or more FIELD definitions.

**INDEX*n*={'*attributename*' | X'*attributename*'}{,FIELD*n*[,FIELD*n*...]}**
Valid components of the INDEX*n* parameter are:

**'*attributename*' | X'*attributename*'**
Specifies a user-defined attribute name to be associated with the actual index value. The attribute name is a label for the actual index value. For example, assume that INDEX1 is a person's bank account number. The string 'Account Number' would be a meaningful attribute name. The value of

INDEX1 would be the account number (for example, 1234567). The attribute name is a string 1 - 250 bytes. ACIF does not do any validity checking on the contents of the attribute name.

**Note:** The attribute name can be specified as EBCDIC character data or hexadecimal data. However, if the input data file is *anything other than* EBCDIC, the value *must* be specified as hexadecimal data.

**FIELD*n*[,FIELD*n*...]**
Specifies one or more FIELD*n* parameters that compose the index value. A maximum of 16 FIELD*n* parameters can be specified. If more than one FIELD*n* parameter is specified, ACIF concatenates them into one physical string of data. No delimiters are used between the concatenated fields. Because an index value has a maximum length of 250 bytes, the total of all specified FIELD*n* parameters for a single index cannot exceed this length. ACIF reports an error condition and ends processing if this error occurs.

If literal values (constants) are specified for every index, ACIF treats the entire file as one page group and uses this information to index the document. ACIF reports an error condition and ends processing if literal values are specified for all INDEX*n* parameters and if any TRIGGER*n* parameters are also specified.

For FIELD*n* parameters that specify data values within the file, ACIF determines the actual location of the indexing information that is based on the indexing anchor record, set by the TRIGGER*n* parameters.

A valid set of index parameters comprises either of these:

- FIELD definitions that contain only literal values (constant data).
- FIELD definitions that contain both literal values and application data (data fields in the print file).

You can also specify the same FIELD*n* parameters in more than one INDEX*n* parameter.

**Note:** If one or more TRIGGER*n* parameters are specified (that is, ACIF indexes the file), at least one INDEX*n* parameter must be specified, and that index must comprise at least one FIELD*n* parameter value that is not a literal. ACIF reports an error condition and ends processing if this rule is not satisfied.

The following example specifies that the first index tag for the patent number is made up of the literal character string '1234567' and the second index tag for the employee name is made up of fields within the file records:

```
FIELD1='1234567'
FIELD2=0,10,20
FIELD3=0,25,20
INDEX1='Patent Number',FIELD1
INDEX2='Employee Name',FIELD2,FIELD3
```

The next example specifies both index tags as literal values. The entire file is indexed by using these two values. The resulting index object file contains only one record in this case.

```
FIELD1='123456'
FIELD2='444556677'
INDEX1='Account Number',FIELD1
INDEX2='Social Security Number',FIELD2
```

**Note:** The preceding examples are based on character input data. If the input data was *not* EBCDIC, the literal values that are used in these examples would be expressed in hexadecimal strings. For an example that uses hexadecimal strings, see Figure 16 on page 87.

See Chapter 4, “Enhanced indexing parameters,” on page 67 for information about using the INDEX*n* parameter with enhanced ACIF indexing.

## INDEXDD

Specifies the name for the index object file.

**z/OS and VM**

**INDEXDD={INDEX | *ddname*}**

Specifies the DD name for the index object file. The DD name is a 1- to 8-byte character string that contains only those alphanumeric characters that are supported in the operating environment. When ACIF is indexing the file, it writes indexing information to this DD name. These DCB characteristics are suggested for the file:

- A block size of 32760
- A maximum record length of 32756

  If a record length other than 32756 is specified, ACIF might produce a record of length greater than what is allowed by the INDEX DD statement. If that happens, ACIF ends processing abnormally.
- Variable blocked format
- Physical sequential format

If INDEXDD is not specified, ACIF uses INDEX as the default DD name.

**VSE**

**INDEXDD={INDEX | *filename* (DEVT=TAPE | DISK)}**

Specifies the file name and device type that appears on the DLBL or TLBL JCL statement. The file name is a 1- to 7-byte character string that contains only those alphanumeric characters that are supported in VSE. The device type is either TAPE or DISK. These are the DTF characteristics for the file:

- A block size of 32760
- A maximum record length of 32756

  If a record length other than 32756 is specified, ACIF might produce a record of length greater than what is allowed by the DLBL or TLBL JCL statement. If that happens, ACIF ends processing abnormally.
- Variable blocked format
- Assigned to programmer logical unit 009

If INDEXDD is not specified, ACIF uses INDEX as the default file name and DISK as the default device type.

## INDEXOBJ

Specifies the type of information ACIF puts in the index object file.

**INDEXOBJ={GROUP | ALL | NONE | BDTLY}**

The values are:

**GROUP**

ACIF places only group-level entries into the index object file, which saves space.

**ALL**

ACIF places both page-level and group-level entries into the index object file. Select ALL if you are indexing a file for use with the AFP Workbench Viewer application.

**NONE**

ACIF suppresses the collection of all index-level information. Select NONE if you do not require an external index file. Selecting NONE also reduces ACIF storage requirements.

**BDTLY**

ACIF passes all Begin Document (BDT) and End Document (EDT) structured field pairs from the MO:DCA-P input file to the output data stream in the same order they are found without creating any additional BDT/EDT pairs. After the ACIF output goes to PSF for printing, the printer uses the BDT/EDT pairs to indicate document boundaries for finishing (such as stapling). If BDTLY is not specified, ACIF normally removes multiple BDT and EDT structured fields from the input file and generates a single BDT/EDT structured field pair for the entire output. This situation is because MO:DCA-P indexes are relative to the BDT structured field.

**Notes:**

1. This value is not valid when the input file is line data because line data does not contain BDT and EDT structured fields.
2. The index object file that is created is suitable for printing, but must not be used with indexing because the resulting index is not MO:DCA-P compliant and might not be processed correctly by programs that use the index.

If this parameter is not specified, ACIF uses GROUP as the default.

## INDEXSTARTBY

Specifies the output page number by which ACIF must find a group indexing field, if ACIF is indexing the file.

**Keep in mind:** GROUP, RECORDRANGE, and FLOAT triggers apply only if you are using enhanced indexing. A group indexing field is based on a GROUP or RECORDRANGE trigger, not on a FLOAT trigger.

**INDEXSTARTBY={1 | *nn*}**

The values are:

**1**

Specifies that ACIF must find a group index on the first page.

***nn***

Specifies the output page number (0 - 99) by which ACIF must find the group index criteria specified. 0 indicates that there is no limit to the page where ACIF must find a group indexing field.

This parameter is helpful if, for example, your file contains header pages. If your file contains two header pages, you can specify a page number that is one greater than the number of header pages (INDEXSTARTBY=3).

If ACIF does not find a group indexing field before the page number specified in the INDEXSTARTBY parameter, it issues a message and stops processing. If you do not want ACIF to stop processing when it cannot find a group indexing field or when a file is empty, you must set the parameter to INDEXSTARTBY=0 or specify EXTENSIONS=EMPTYOK.

## INDXEXIT

Specifies the 1- to 8-byte character name of the index record exit program.

**INDXEXIT=*modulename***

ACIF loads this module name during initialization and then calls for every record (structured field) it writes to the index object file (specified with the INDEXDD parameter). If this parameter is not specified, no index record exit is used. For more detailed information, see "Index record exit" on page 101.

## INPEXIT

Specifies the 1- to 8-byte character name of the input record exit program.

**INPEXIT=*modulename***

ACIF loads this module name during initialization and then calls for every input record it reads from the input file (specified with the INPUTDD parameter). If this parameter is not specified, no input record exit is used. See "Input record exit" on page 99 for more detailed information.

## INPUTDD

Specifies the name of the input file.

**z/OS and VM**

**INPUTDD={INPUT | *ddname*}**

Specifies the DD name for the file ACIF processes. The DD name is a 1- to 8-byte character string that contains only those alphanumeric characters that are supported in the operating environment. When ACIF processes a file, it reads from this DD name.

If INPUTDD is not specified, ACIF uses INPUT as the default DD name.

**VSE**

**INPUTDD={INPUT | *filename* (LRECL=*nnnn*,BLKSIZE=*nnnn*,RECFM=F|FB|V|VB,DEVT=TAPE | DISK)}**

Specifies the file name and file characteristics that appear on the DLBL or TLBL JCL statement. The file name is a 1- to 7-byte character string that contains only those alphanumeric characters that are supported in the operating environment.

The values are:

**INPUT**

ACIF uses INPUT as the name for the input file.

***filename***

A character string that contains only those alphanumeric characters that are supported in VSE file names.

**LRECL=*nnnn***

Specifies the record length of the input data set.

**BLKSIZE=*nnnn***

Specifies the block size of the input data set.

**RECFM=F|FB|V|VB**

Specifies the record format of the input data set.

**F**

Fixed

**FB**

Fixed Block

**V**

Variable

**VB**

Variable Block

**DEVT=TAPE | DISK**

Specifies the device type, either TAPE or DISK.

**Note:** ACIF supports SAM or VSAM-managed SAM. It does not support VSAM ISDS, ESDS, or RRDS.

If INPUTDD is not specified, ACIF uses these default values:

- INDEX for the file name
- 133 bytes for the record length
- Unblocked records
- F for the record format
- DISK as the default device type
- Assigned to programmer logical unit 006

## INSERTIMM

Specifies whether ACIF is to insert an Invoke Medium Map (IMM) structured field before the first Begin Page (BPG) structured field of every named page group.

**INSERTIMM={YES | NO}**
The values are:

**YES**
Specifies that ACIF inserts an IMM before the first BPG structured field in the named page group if no IMM was encountered within the named page group.

**NO**
Specifies that an IMM is not inserted before the first BPG structured field.

If this parameter is not specified, ACIF uses NO as the default.

## LINEOFFSET

Specifies whether ANSI carriage-control characters are used to calculate the record offsets when the location of the fields is determined. Only the 0 (space two lines) and - (space three lines) characters are supported. The + (overstrike) character is not supported.

ACIF interprets the ANSI carriage controls, and then rewrites the input data as if it is printed with the 0 or - carriage controls. The index values must relate to the newly formatted input file.

**LINEOFFSET={ASREAD | ASPRINTED}**

The options are:

**ASREAD**
ANSI carriage controls are not used to calculate the record offsets for the fields. The offsets are relative to the lines as they are read from the load file.

**ASPRINTED**
ANSI carriage controls are used to calculate the record offsets for the fields. The offsets are relative to the line spacing that occurs when the lines are printed.

For example, the first three records of an input file contain this data, with an ANSI carriage control as the first character:

```
1REPORT
-ACCOUNT 777777
0JOHN SMITH
```

When ASREAD (the default) is specified, the indexing parameters for the account number and name are:

**TRIGGER1=*,1,'REPORT'**
Search all * records, starting at column 1, and look for "REPORT"=*anchor record*.

**FIELD1=1,10,6**
Use information from anchor record +1, in column 10, for 6 bytes = 7777777.

**FIELD2=2,2,10**
Use information from anchor record +2, in column 2, for 10 bytes = JOHN SMITH.

When ASPRINTED is specified, the indexing parameters for the account number and name are:

**TRIGGER1=*,1,'REPORT'**
Set anchor record where "REPORT" is found.

**FIELD1=3,10,6**
Use information from anchor record +3, in column 10, for 6 bytes = 7777777. "-" means space 3 lines, so go down 3 records to find the data.

**FIELD2=5,2,10**
Use information from anchor record +5, in column 2, for 10 bytes = JOHN SMITH. "0" means space 2 lines, so go down 3+2 records to find the data.

## MCF2REF

Specifies the way ACIF builds the Map Coded Font Format 2 (MCF-2) structured field in the OUTPUT file and the RESOBJ file.

**MCF2REF={CPCS | CF}**
The values are:

**CPCS**
ACIF uses the names of the code page and character set to build the MCF-2 structured field. ACIF opens and reads the contents of all coded fonts that are specified in MCFs in the input file or input resources.

**CF**
ACIF uses the name of the coded font to build the MCF-2 structured field. This value is recommended when you are processing DBCS fonts. Specifying CF improves ACIF performance because, if RESTYPE=FONT or RESTYPE=ALL is not specified, ACIF does not have to read the coded fonts from the font library.

If this parameter is not specified, ACIF uses CPCS as the default.

## MSGDD

Specifies the name of the error message file in z/OS and VM. This parameter is not used for VSE.

**MSGDD={SYSPRINT | *ddname*}**
Specifies the DD name for the file where ACIF writes error messages. The DD name is a 1- to 8-byte character string that contains only those alphanumeric characters that are supported in the operating environment. When ACIF processes a file, it writes to the DD name.

If MSGDD is not specified, ACIF uses SYSPRINT as the default DD name.

## OBJCONLIB

Specifies the location where object container setup files and resources are stored. Object container resources contain non-OCA data objects, such as color mapping tables (CMT), Encapsulated PostScript (EPS), microfilm setup files, Portable Document Format (PDF) objects, and TIFF images. This parameter is not used for VSE.

### z/OS

**OBJCONLIB=*dsname1*[,*dsname2*][,*dsname3...*]**
Specifies the data sets that compose the object container library. You can specify a maximum of 16 data sets. For example:

```
OBJCONLIB=SYS1.OBJCONLIB,USER.OBJCONLIB
```

This parameter also specifies the concatenation sequence when ACIF searches for a particular file. ACIF first looks for a file in *dsname1*. If it cannot find the file in *dsname1*, it continues the search with *dsname2*, and so on, until it locates the requested file or exhausts the list of specified data sets.

If USERLIB is also specified, ACIF searches for the resource in the data sets specified in the USERLIB before it searches the data sets identified in OBJCONLIB.

**Notes:**

1. Data sets must be specified as fully qualified names without quotation marks.
2. If the libraries specified for OBJCONLIB are not specified in the same order that is used by the PSF startup procedure, the printed and converted results might differ. For information about how PSF selects resources, see *PSF for z/OS: Customization*.
3. For systems before MVS/DFP Version 2.3, data sets must be concatenated with the largest block size first.

**VM**

**OBJCONLIB=*filetype1*[,*filetype2*][,*filetype3...*]**

Specifies the file types that define the object container file library. You can specify a maximum of eight file types. For example:

```
    OBJCONLIB=OBJ3820,TEMPOBJ
```

This parameter also specifies the search order in which ACIF searches for a particular file. ACIF first looks for the resource with a file type of *filetype1*. If it cannot find the resource with a file type of *filetype1*, it continues the search with *filetype2*, and so on, until it locates the requested resource or exhausts the list of specified file types.

**Note:** File type values must conform to CMS naming conventions.

**VSE**

This parameter is not used for VSE. Object container resources are in the library that is defined by the `// LIBDEF PHASE,SEARCH=(…)` JCL statement. For information about how PSF/VSE selects resources, see *Print Services Facility/VSE: System Programming Guide*.

## OBJCPATH

Specifies the names of UNIX file system directories for object container files that contain data objects and color management resources (CMRs). This parameter is not supported for VM or VSE; if specified, you see an error message.

**Note:** This parameter applies only to objects that are installed with a resource access table (RAT). For more information about resources that are installed with RATs, see Appendix B, “Processing resources installed with resource access tables,” on page 217.

**OBJCPATH=*pathlist***

The value is:

***pathlist***

Any valid search path. You must use a colon (:) to separate multiple paths. For example:

```
INPUTDD=INFILE
OUTPUTDD=OUTFILE
PAGEDEF=PAGTRUE
FORMDEF=F1A10110
OBJCPATH='/jdoe/objects/color:/jdoe/objects/color/myobjects/'
```

**Note:** To continue a *pathlist* on multiple lines in a parameter file, type the *pathlist* to the last character of the first line and then continue typing in the first column of the next line.

ACIF searches the paths in the order in which they are specified.

**Keep in mind:** The total number of all characters in the string of path names cannot exceed 4095 bytes.

## OUTEXIT

Specifies the name of the output record exit program.

**OUTEXIT=*modulename***

Specifies the name of the output record exit program. This value is a 1- to 8-byte character name of the module ACIF loads during initialization and then calls for every output record it writes to the output document file (specified with the OUTPUTDD parameter). If this parameter is not specified, no output record exit is used. For more detailed information, see “Output record exit” on page 102.

## OUTPUTDD

Specifies the name of the output document file.

### z/OS and VM

**OUTPUTDD={OUTPUT | *ddname*}**

Specifies the DD name for the output document file ACIF produces when it processes a file. The DD name is a 1- to 8-byte character string that contains only those alphanumeric characters that are supported in the operating environment. When ACIF processes a print file, it writes the resultant converted print data to this DD name. These DCB characteristics are suggested for the file:

- Variable blocked format
- A maximum record length of 32756

  If a record length other than 32756 is specified, ACIF might produce a record of length greater than what is allowed by the OUTPUT DD statement. ACIF then ends processing abnormally.
- A block size of 32760
- Physical sequential format

If OUTPUTDD is not specified, ACIF uses OUTPUT as the default DD name.

### VSE

**OUTPUTDD={OUTPUT| *filename* (DEVT=TAPE | DISK)}**

Specifies the file name and file characteristics that appears on the DLBL or TLBL JCL statement. The file name is a 1- to 7-byte character string that contains only those alphanumeric characters that are supported in the operating environment. Characteristics of the file are:

- A block size of 32760
- A maximum record length of 32756

  If a record length other than 32756 is specified, ACIF might produce a record of length greater than what is allowed by the DLBL or TLBL JCL statement. If that happens, ACIF ends processing abnormally.
- Variable blocked format
- Assigned to programmer logical unit 007

If OUTPUTDD is not specified, ACIF uses OUTPUT as the default file name and DISK as the default device type.

## OVLYLIB

Specifies the location of overlays. This parameter is not used for VSE.

### z/OS

**OVLYLIB=*dsname1*[,*dsname2*][,*dsname3...*]**

Specifies the data sets that compose the overlay library. You can specify a maximum of 16 data sets. For example:

```
OVLYLIB=SYS1.OVLYLIB,USER.OVLYLIB
```

The parameter also specifies the concatenation sequence when ACIF searches for a particular overlay resource. ACIF first looks for the resource in *dsname1*. If ACIF cannot find the resource in *dsname1*, it continues the search with *dsname2*, and so on, until it either locates the requested resource or exhausts the list of specified data sets.

If USERLIB is also specified, ACIF searches for the resource in the data sets specified in USERLIB before it searches the data sets identified in OVLYLIB.

**Notes:**

1. Data sets must be specified as fully qualified names without quotation marks.
2. If the libraries specified for OVLYLIB are not specified in the same order that is used by the PSF startup procedure, the printed and converted results might differ. For information about how PSF selects resources, see *PSF for z/OS: Customization*.

3. For systems before MVS/DFP Version 2.3, data sets must be concatenated with the largest block size first.
4. This parameter is required if overlay retrieval is requested and USERLIB is not specified. The RESTYPE value determines whether overlays are to be retrieved for inclusion in the resource data set. If this parameter is not specified, and overlay retrieval is requested, ACIF reports an error condition and ends processing.

**VM**

**OVLYLIB=*filetype1*[,*filetype2*][,*filetype3...*]**

Specifies the file types that define the overlay libraries. You can specify a maximum of eight file types. For example:

```
OVLYLIB=OVLY38PP,TEMPOVLY
```

This parameter also specifies the search order when ACIF searches for a particular overlay resource. ACIF first looks for the resource with a file type of *filetype1*. If ACIF cannot find the resource with a file type of *filetype1*, it continues the search with *filetype2*, and so on, until it either locates the requested resource or exhausts the list of specified files.

**Notes:**

1. File types must conform to CMS naming conventions.
2. This parameter is required if overlay retrieval is requested and USERLIB is not specified. The RESTYPE parameter determines whether overlays are to be retrieved for inclusion in the resource file. If OVLYLIB is not specified, and overlay retrieval is requested, ACIF reports an error condition and ends processing.

**VSE**

This parameter is not used for VSE. Overlay resources are in the library that is defined by the `// LIBDEF PHASE,SEARCH=(…)` JCL statement. For information about how PSF/VSE selects resources, see *Print Services Facility/VSE: System Programming Guide*.

## PAGEDEF

Specifies the file name (in VM) or the member name (in z/OS or VSE) of the page definition. A page definition defines the page format that ACIF uses to compose line data, XML data, and mixed-mode data into pages; it is not used with MO:DCA-P data. Page definitions are only used by ACIF at transform time to convert data streams; they are not used by PSF to print the output that is produced by ACIF.

**Note:** Inline page definitions are removed from the output data, even if RESTYPE=INLINE or RESTYPE=INLONLY. Page definitions are not saved in the output resource library.

**PAGEDEF=*pdefname***

The value is:

***pdefname***

Any valid page definition name. The *pdefname* can be 1 - 8 alphanumeric characters (a-z, A-Z, 0–9) and special characters (# $ @), including the 2-character prefix, if there is one. Unlike PSF for z/OS, PSF/VM, and PSF/VSE, ACIF does *not* require the name to begin with a P1 prefix; however, if the name does begin with P1, you cannot omit it. For example:

```
PAGEDEF=P1USER10
```

**Notes:**

1. If the file name of the page definition includes a file extension, do not use the file extension when you are specifying the page definition. For example, to use a page definition that is named `MEMO.PDEF38PP`, specify PAGEDEF=MEMO.
2. ACIF does not require a page definition when it is indexing an AFP data stream file. However, ACIF does require a page definition to transform an input file that contains line data, XML data,

or mixed-mode data into MO:DCA-P. If you are transforming such an input file and you do not specify the PAGEDEF parameter, or you specify PAGEDEF without a page definition file name, ACIF reports an error condition and ends processing.

3. If you use the PAGEDEF parameter to specify a page definition that names fonts, but you also use the CHARS parameter to specify fonts, the CHARS parameter is ignored. Therefore, if your page definition names fonts, do not use the CHARS parameter.
4. ACIF does not support a parameter equivalent to the LINECT parameter on the /*JOBPARM, /*OUTPUT, and OUTPUT JCL statements. The maximum number of lines that are processed on a page is defined in the page definition.

The page definition that you use can be found in one of these locations:

**Inline in the file**

A page definition can be an inline resource in all data formats except XML. (XML data cannot have carriage control characters, which are used to identify inline resources.) If the page definition is an inline resource, you must do these tasks:

1. Include an inline form definition in the file.
2. Specify CC=YES to indicate that the file contains carriage control characters. If the length of the records in the page definition is less than or equal to the logical-record length defined for the file, you can specify fixed-length records for the record format. If the length of the records in the page definition is greater than the logical-record length defined for the file, you must specify:
   - Variable length records in z/OS or VSE for the record format (variable blocked with ANSI carriage control characters [VBA] or variable blocked with machine carriage control characters [VBM])
   - Variable length records in VM for the record format
3. Specify PAGEDEF with one of these values:

   ***pdefname***

   Indicates the name of the inline page definition. If the name specified in the PAGEDEF parameter does not match the name of an inline page definition, ACIF looks for the page definition in the PAGEDEF search path or uses the page definition from the resource library.

   **DUMMY**

   If the file does not include an inline page definition, ACIF looks for the page definition named DUMMY. If ACIF cannot find a page definition that is named DUMMY, it reports an error and ends processing.

   **Note:** DUMMY must be specified in all uppercase letters.

An input file can contain multiple page definitions, but only one page definition can be used by ACIF. If a file contains more than one inline page definition, and you specify PAGEDEF=*pdefname*, ACIF uses the first inline page definition named *pdefname*. If a file contains more than one inline page definition and you specify PAGEDEF=DUMMY, ACIF uses the first inline page definition in the input file. By changing the page definition name in the PAGEDEF parameter on different printing jobs, you can test different page definitions.

**z/OS or VM library**

Use the USERLIB or PDEFLIB parameter to specify the path to the file or the data sets. For example:

```
PAGEDEF=MEMO
USERLIB=USER.RESOURCES
```

```
PAGEDEF=MEMO
PDEFLIB=USER.PAGEDEFNS
```

**VSE library**

The `// LIBDEF PHASE,SEARCH=(…) DLBL` JCL statement references the VSE library.

## PARMDD

Specifies the name of the parameter file. The parameter file can contain a maximum of 100 records. If the file contains more than 100 records, ACIF issues an error message. This parameter is not used for VSE.

**PARMDD={SYSIN | *ddname*}**
Specifies the DD name for the parameter file that contains ACIF parameters and values. The DD name is a 1- to 8-byte character string that contains only those alphanumeric characters that are supported in the operating environment. This parameter is specified in an EXEC statement or on the command line.

If PARMDD is not specified, ACIF uses SYSIN as the default DD name.

## PDEFLIB

Specifies the location of page definitions. This parameter is not used for VSE.

**z/OS**

**PDEFLIB=*dsname1*[,*dsname2*][,*dsname3...*]**
Specifies the data sets that compose the page-definition library. You can specify a maximum of 16 data sets. For example:

```
PDEFLIB=SYS1.PDEFLIB,USER.PDEFLIB
```

This parameter also specifies the concatenation sequence when ACIF searches for a particular page definition. ACIF first looks for the resource in *dsname1*. If ACIF cannot find the resource in *dsname1*, it continues the search with *dsname2*, and so on, until it either locates the requested resource or exhausts the list of specified data sets.

If USERLIB is also specified, ACIF searches for the resource in the data sets specified in USERLIB before it searches the data sets identified in PDEFLIB.

**Notes:**

1. Data sets must be specified as fully qualified names without quotation marks.
2. If the libraries specified for PDEFLIB are not specified in the same order that is used by the PSF startup procedure, the printed and converted results might differ. For information about how PSF selects resources, see *PSF for z/OS: Customization*.
3. For systems before MVS/DFP Version 2.3, files must be concatenated with the largest block size first.
4. This parameter is required if the input file contains any line data and USERLIB is not specified. If this parameter is not specified and the input file contains line data, ACIF reports an error condition and ends processing.

**VM**

**PDEFLIB=*filetype1*[,*filetype2* ][,*filetype3...*]**
Specifies the file types that define the page-definition libraries. You can specify a maximum of eight file types. For example:

```
PDEFLIB=PDEF38PP,TESTPDEF
```

This parameter also specifies the search order when ACIF searches for a particular PAGEDEF resource. ACIF first looks for the resource with a file type of *filetype1*. If ACIF cannot find the resource with a file type of *filetype1*, it continues the search with *filetype2*, and so on, until it either locates the requested resource or exhausts the list of specified files.

**Notes:**

1. The file types must conform to CMS naming conventions.

2. This parameter is required if the print file contains any line data and USERLIB is not specified. If this parameter is not specified, and the print file contains any line data, ACIF reports an error condition and ends processing.

### VSE

This parameter is not used for VSE. Page-definition resources are in the library that is defined by the `// LIBDEF PHASE,SEARCH=(…)` JCL statement. For information about how PSF/VSE selects resources, see *Print Services Facility/VSE: System Programming Guide*.

## PRMODE

Specifies the type of data in the input file and whether ACIF must do optional processing of that data.

**PRMODE={SOSI1 | SOSI2 | SOSI3 | SOSI4 | *aaaaaaaa*}**
The values are:

**SOSI1**
Specifies that each shift-out, shift-in code is converted to a blank and a Set Coded Font Local text control. This SOSI1 data conversion is the same as the one done by PSF for z/OS, PSF/VM, and PSF/VSE.

**SOSI2**
Specifies that each shift-out, shift-in code is converted to a Set Coded Font Local text control. This SOSI2 data conversion is the same as the one done by PSF for z/OS, PSF/VM, and PSF/VSE.

**SOSI3**
Specifies that each shift-out character is converted to a Set Coded Font Local text control. Each shift-in is converted to a Set Coded Font Local Text control and two blanks. This SOSI3 data conversion is the same as the one done by PSF for z/OS.

**SOSI4**
Specifies that each shift-out, shift-in code is skipped and not counted when offsets are calculated for the input file. SOSI4 is used when DBCS text is converted from ASCII to EBCDIC. When SOSI4 is specified, the page definition offsets are correct after conversion; therefore, the user does not need to account for SOSI characters when FIELD offsets are computed. The processing of shift-out and shift-in codes for SOSI4 is the same as for SOSI2.

***aaaaaaaa***
Any 8-byte alphanumeric string. This value is supplied to all of the ACIF user exits. Using the AFPDS value indicates that the data contains MO:DCA-P structured fields.

**Notes:**

1. Do not specify a SOSI value if the line data contains UTF8 or UTF16 data.
2. For the SOSI processing to work correctly, the first font that is specified in the CHARS parameter (or in a font list in a page definition) must be a single-byte font, and the second font must be a double-byte font.

For more information about processing line data with SOSI controls, see *Advanced Function Presentation: Programming Guide and Line Data Reference*.

## PSEGLIB

Specifies the location where page segments and BCOCA, GOCA, IOCA, and PTOCA objects are stored. This parameter is not used for VSE.

### z/OS

**PSEGLIB=*dsname1*[,*dsname2*][,*dsname3...*]**
Specifies the data sets that compose the page segment library. You can specify a maximum of 16 data sets. For example:

```
PSEGLIB=SYS1.PSEGLIB,USER.PSEGLIB
```

This parameter also specifies the concatenation sequence when ACIF searches for a particular page segment or BCOCA, GOCA, IOCA, or PTOCA object. ACIF first looks for the resource in *dsname1*. If it cannot find the resource in *dsname1*, it continues the search with *dsname2*, and so on, until it either locates the requested resource or exhausts the list of specified data sets.

If USERLIB is also specified, ACIF searches for the resource in the files that are specified in USERLIB before it searches the files identified in PSEGLIB.

**Notes:**

1. Data sets must be specified as fully qualified names without quotation marks.
2. If the libraries specified for PSEGLIB are not specified in the same order that is used by the PSF startup procedure, the printed and converted results might differ. For information about how PSF selects resources, see *PSF for z/OS: Customization*.
3. For systems before MVS/DFP Version 2.3, data sets must be concatenated with the largest block size first.
4. This parameter is required if page segment retrieval is requested and USERLIB is not specified. The RESTYPE value determines whether page segments are to be retrieved for inclusion in the resource data set. If this parameter is not specified, and page segment retrieval is requested, ACIF reports an error condition and ends processing.

### VM

**PSEGLIB=*filetype1*[,*filetype2*][,*filetype3*...]**
Specifies the file types that define the page segment libraries. You can specify a maximum of eight file types. For example:

```
PSEGLIB=PSEG38PP,PSEGTEST
```

This parameter also specifies the search order when ACIF searches for a particular page segment resource. ACIF first looks for the resource with a file type of *filetype1*. If it cannot find the resource with a file type of *filetype1*, it continues the search with *filetype2*, and so on, until it either locates the requested resource or exhausts the list of specified files.

**Notes:**

1. The file types must conform to CMS naming conventions.
2. This parameter is required if page segment retrieval is requested and USERLIB is not specified. The RESTYPE value determines whether page segments are to be retrieved for inclusion in the resource file. If this parameter is not specified, and page segment retrieval is requested, ACIF reports an error condition and ends processing.

### VSE

This parameter is not used for VSE. Page-segment resources are in the library that is defined by the `// LIBDEF PHASE,SEARCH=(…)` JCL statement. For information about how PSF/VSE selects resources, see *Print Services Facility/VSE: System Programming Guide*.

## RESEXIT

Specifies the name of the resource exit program.

**RESEXIT=*modulename***
Specifies the name of the resource exit program. This value is a 1- to 8-byte character name of the module ACIF loads during initialization and then calls each time that it attempts to retrieve a requested resource from a library. If this parameter is not specified, no resource exit is used. For more detailed information, see "Resource exit" on page 103.

## RESFILE

Specifies the format of the resource file that is created by ACIF in z/OS. This parameter is only used for z/OS. ACIF can create either a sequential data set or a partitioned data set (PDS) from the resources it retrieves from the PSF for z/OS resource libraries.

**RESFILE={SEQ | PDS}**
The values are:

**SEQ**
Creates a resource group that can be concatenated to the document file as inline resources.

The format of the resource file that is specified for TrueType and OpenType fonts must be SEQ.

**PDS**
Creates a member that can be placed in a user library or in a system library for use by PSF. The file that is created by selecting PDS cannot be concatenated to the document file and used as inline resources.

If this parameter is not specified, ACIF writes to the DD name specified in the RESOBJDD parameter, assuming a sequential format. For more information about the contents of the resource data set, see "Format of the resources file" on page 223.

The parameters that you use to allocate the RESOBJDD data set must be compatible with the value of the RESFILE parameter. For example, if RESFILE=PDS, then DSORG=PO must be specified in the DD statement of the data set named by the RESOBJDD parameter. In addition, the SPACE parameter must include a value for directory blocks, such as SPACE=`(12288,(150,15,15))`, in the DD statement of the data set named by the RESOBJDD parameter.

If RESFILE=SEQ is specified, then DSORG=PS must be specified in the DD statement of the data set named by the RESOBJDD parameter. In addition, the SPACE parameter must not include a directory value, as in SPACE=`(12288,(150,15))`, in the DD statement of the data set named by the RESOBJDD parameter. Failure to allocate the data set named by the RESOBJDD parameter in a manner compatible with the specification of the RESFILE parameter might result in a RESOBJDD data set that is unusable.

If RESFILE is not specified, ACIF uses SEQ as the default.

## RESOBJDD

Specifies the name of the resource file.

**Note:** If the input file that is specified with the INPUTDD parameter is empty and EXTENSIONS=EMPTYOK, ACIF does not produce a resource file.

### z/OS and VM

**RESOBJDD={RESOBJ | *ddname*}**
Specifies the DD name for the resource file. When ACIF processes a print file, it can optionally create a file that contains all or some of the resources that are required to print or view the file. It then writes the resource data to this DD name. The DD name is a 1- to 8-byte character string that contains only those alphanumeric characters that are supported in the operating environment. These DCB characteristics are required for the file:

- Variable blocked format
- A maximum record length of 32756

  If a record length other than 32756 is specified, ACIF might produce a record of length greater than what is allowed by the RESOBJDD statement. If this situation happens, ACIF ends processing abnormally.
- A block size of 32760
- Physical, sequential format

If RESOBJDD is not specified, ACIF uses RESOBJ as the default DD name.

**VSE**

**RESOBJDD={RESOBJ | *filename* (DEVT=TAPE | DISK)}**

Specifies the file name and file characteristics that appears on the DLBL or TLBL JCL statement. The file name is a 1- to 7-byte character string that contains only those alphanumeric characters that are supported in the operating environment. The characteristics of the file are:

- A variable blocked file
- A maximum record length of 32756

  If a record length other than 32756 is specified, ACIF might produce a record of length greater than what is allowed by the DLBL or TLBL JCL statement. If this situation happens, ACIF ends processing abnormally.
- A block size of 32760
- Assigned to programmer logical unit 008

If RESOBJDD is not specified, ACIF uses RESOBJ as the default file name and DISK as the default device type.

## RESTYPE

Specifies the type of AFP print resources ACIF retrieves from the resource directories or libraries for inclusion in the resource file (specified with the RESOBJDD parameter).

**Note:** All inline resources that match the type that is specified with RESTYPE are included in the resource file, regardless of whether they are used in the document. However, if you specify EXTENSIONS=RESORDER, only those resources that are used are written to the resource file.

**RESTYPE={NONE | ALL | [FDEF][,PSEG][,OVLY][,FONT][,OBJCON][,BCOCA] [,GOCA][,IOCA][,PTOCA] [,CMRALL][,CMRGEN][,INLINE][,INLONLY]}**

The values are:

**NONE**

Specifies that no resource file is created.

**ALL**

Specifies that all resources that are required to print or view the output document file (specified with the OUTPUTDD parameter) are included in the resource file.

**Attention:** Specifying this value can create large resource files, particularly when color management resources (CMRs) are included.

**FDEF**

Specifies that the form definition (specified with the FORMDEF parameter) that is used in processing the file is included in the resource file.

**PSEG**

Specifies that all page segments that are required to print or view the output document file are included in the resource file.

**OVLY**

Specifies that all overlays that are required to print or view the output document file are included in the resource file.

**FONT**

Specifies that all font character sets and code pages that are required to print or view the output file are included in the resource file. Also used for TrueType and OpenType fonts. Specifies that all base fonts, linked fonts, and font collections that are required to print the output file are included in the resource file. If MCF2REF=CF is specified, ACIF also includes coded fonts in the resource file; otherwise, coded fonts are not included in the resource file.

**Notes:**

1. Specifying RESTYPE=FONT is not recommended with double-byte raster fonts because of the size and large number of library members that are needed to process double-byte raster fonts.

If RESTYPE=FONT is specified, you might want to specify MCF2REF=CF, which can improve ACIF performance by reducing the number of font members ACIF processes.

2. When you specify RESTYPE=FONT with TrueType and OpenType fonts, the embed flag must be set “on” to save the font in the resource file. For more information, see *Using OpenType Fonts in an AFP System*.
3. ACIF wraps TrueType and OpenType fonts in MO:DCA-P structured fields when it saves them in the resource file.
4. When EXTENSIONS=RESORDER is specified with RESTYPE=FONT, TrueType and OpenType fonts that were originally inline in the input file are not saved in the resource library.
5. When RESTYPE=FONT is specified, ACIF checks to see whether a Map Data Resource (MDR) structured field setting requires that a requested data object font is inline in the input file resource group.

**OBJCON**
Specifies that all object container files that are requested by the input data stream be included in the resource file. These object container files include objects such as color mapping tables specified by the COLORMAP parameter, the COM setup file that is specified by the COMSETUP parameter, color management resources (CMRs), Encapsulated PostScript (EPS), Portable Document Format (PDF) objects, TIFF images, and Metadata-1 objects.

**Note:** When printing only one page from a multiple page object container file, all pages in the object container are still saved in the resource file.

**BCOCA**
Specifies that all BCOCA objects included by an IOB structured field that is required to print or view the output document file is included in the resource file.

**GOCA**
Specifies that all GOCA objects included by an IOB structured field that is required to print or view the output document file is included in the resource file.

**IOCA**
Specifies that all IOCA objects included by an IOB structured field that is required to print or view the output document file is included in the resource file.

**PTOCA**
Specifies that all PTOCA objects included by an IOB structured field that is required to print or view the output document file is included in the resource file.

**CMRALL**
Specifies that all CMRs required to print or view the output document file (except link CMRs) are included in the resource file. These CMRs include all CMRs referenced in the data stream, all CMRs referenced through a data object or color management resource access table (RAT), and all generic halftone and tone transfer curve CMRs. For more information about the RAT, see Appendix B, “Processing resources installed with resource access tables,” on page 217.

**CMRGEN**
Specifies that all CMRs referenced in the data stream plus any non-device specific CMRs referenced through a data object or color management RAT (except link CMRs) are included in the resource file. With CMRGEN, the output that is generated by ACIF is not device-specific, unless the data stream explicitly references a device-specific CMR.

**INLINE**
When one or more resource object types are specified with RESTYPE, specifies that all inline resources that match the types are written to the output file in addition to the resource file. For example, `RESTYPE=FONT,PSEG,INLINE` causes any inline fonts and page segments to be written to the output file, in addition to writing all inline and library fonts and page segments to the resource file. The inline resources precede the document in the output file. For more information, see “Processing inline resources” on page 215.

**INLONLY**

Specifies that all inline resources that are contained in the input file are written to the output file, regardless of resource type. ACIF searches only for resources that are inline, even if other RESTYPE values are specified. Also, no resource file is created, even if the RESOBJDD parameter is specified.

**Note:** If no form definition is found inline and because a form definition is always required to process the document, ACIF searches for the requested form definition in the libraries.

Because multiple resource types are contained in the font, object container, and page segment libraries, and ACIF does not enforce a prefix for the 8-character resource name, define a naming convention that identifies each type of resource in the library. IBM suggests that you use a 2-character prefix naming convention for 8-character resource names. Other resource types (coded fonts, form definitions, and page definitions) use required prefixes for identification. See *PSF for z/OS: User's Guide* for the required and IBM-recommended prefixes for resources.

ACIF supports the specification of BCOCA, CMRALL, CMRGEN, FDEF, FONT, GOCA, IOCA, INLINE, OBJCON, OVLY, PSEG, and PTOCA in any combination. For example, if you want to specify form definitions, page segments, and overlays as the resource types, you can enter `RESTYPE=FDEF,PSEG,OVLY` or `RESTYPE=OVLY,FDEF,PSEG`.

However, ALL, INLONLY, and NONE are order-dependent and override any individual resource types specified. If more than one is specified, the last one is used. For example, if you specify `RESTYPE=FDEF,INLONLY,PSEG,NONE,OVLY,ALL`, all resources are included.

**Notes:**

1. Not all RESTYPE values are supported in VM or VSE.
2. When you are creating AFP files to view on the AFP Workbench Viewer, do not specify RESTYPE=FONT or RESTYPE=ALL. The AFP Workbench Viewer uses font definition files for font substitution instead of retrieving fonts from a resource file when it displays documents. Therefore, you do not need to download fonts to the resource file, which is time-consuming and increases the number of bytes transmitted when the file is transferred to the workstation or archived.
3. If you have a resource type that you want saved in a resource file, and it is included in another resource type, you must specify both resource types. For example, if you request that only page segments be saved in a resource file, and the page segments are included in overlays, the page segments are not saved in the resource file because the overlays are not searched. In this case, you must request that both page segments and overlays be saved.
4. ACIF saves specified inline resources in the resource file, even if they are not needed to print the job. However, if you specify EXTENSIONS=RESORDER, ACIF saves only the inline resources that are needed to print the job. You can also use a resource exit to filter out any resources that you do not want included in the resource file (see "Resource exit" on page 103 for more information).

## TRACE

Specifies that ACIF provides diagnostic trace information while it is processing the file. This parameter is not used for VM and VSE.

**Note:** Tracing increases processor usage and can be turned off unless you need to do problem determination.

**TRACE={YES | NO | PDS}**

The values are:

**YES**

ACIF uses the facilities of the Generalized Trace Facility (GTF) to produce diagnostic trace records. ACIF writes GTF trace records with a user event ID of X'314'. To capture ACIF GTF records, GTF needs to be started with the option TRACE=USRP, and then modified with USR=(314).

**NO**

ACIF does not produce diagnostic trace records.

**PDS**
ACIF writes trace information to the file specified by the TRACEDD parameter rather than producing a GTF trace.

## TRACEDD

Specifies the name of the file where all ACIF trace information is written. This parameter is not used for VM and VSE.

**TRACEDD={TRACE | *ddname*}**
Specifies the DD name of the file where ACIF trace information is written when TRACE=PDS is specified. The DD name is a 1- to 8-byte character string that contains only those alphanumeric characters that are supported in z/OS. The file that is specified must have these characteristics: `DCB=(LRECL=121,RECFM=FB,DSORG=PS)`

If TRACEDD is not specified, ACIF uses TRACE as the default DD name.

## TRC

Specifies whether the input file contains table reference characters (TRCs). In line data, you can use different fonts on different lines of a file by specifying a TRC at the beginning of each line after the carriage control character, if one is present.

**Note:** TRC characters can be used to map fonts in documents that reference either TrueType and OpenType fonts or FOCA fonts, but not a combination of the two.

For more information about TRCs, see *Advanced Function Presentation: Programming Guide and Line Data Reference*.

**TRC={YES | NO}**
The values are:

**YES**
The input file contains table reference characters.

**NO**
The input file does not contain table reference characters.

**Notes:**

1. The order in which the fonts are specified in the CHARS parameter establishes which number is assigned to each associated TRC. For example, the first font specified is assigned "0", the second font "1", and so on.
2. If you specify TRC=YES but TRCs are not contained in the file, ACIF interprets the first character of each line (or second, if carriage control characters are used) as the font identifier. Consequently, the font that is used to process each line of the file might not be the one you expect and 1 byte of data is lost from each record.
3. If you specify TRC=NO or you do not specify TRC at all, but your line data contains a TRC as the first character of each line (or second if carriage control characters are used), ACIF processes the TRC as a text character in the output rather than using it as a font identifier.

## TRIGGERn

Specifies the locations and values of data fields within the input file that are to be used to define indexing groups in the file. These data fields are referred to as *triggers* because their presence in the file triggers a processing action. A maximum of four TRIGGER*n* parameters can be specified. The number of TRIGGER*n* parameters that are required to uniquely identify the beginning of a group of pages within the file is a function of the complexity of the application output. TRIGGER1 is special and each record in the file that contains this value is referred to as an indexing anchor record. The presence of a TRIGGER*n* parameter causes ACIF to index the input file.

**TRIGGER*n*={*record* | *}{,*column* | *}{,*'triggervalue'* | X*'triggervalue'*}**
Each TRIGGER*n* parameter has three values:

***record* | ***

Specifies the relative record number from the indexing anchor record (TRIGGER1). A value of * *must* be specified for TRIGGER1 and cannot be specified for any other TRIGGER*n* parameter; * indicates that every record is checked for the presence of the TRIGGER1 value. After the TRIGGER1 value is found, all other TRIGGER*n* parameter values are specified as a relative offset from TRIGGER1. ACIF reports an error condition and ends processing if an * is specified with any TRIGGER*n* parameter other than TRIGGER1. The supported range of values for record is 0 - 255.

***column* | ***

Specifies the byte offset from the beginning of the record where the trigger value is located. This value can be specified in absolute terms (for example, 10), as 0, or as *. Specifying 0 or * results in ACIF scanning the record from left to right looking for the trigger value. A value of 1 refers to the first byte in the record. For files that contain carriage control characters, column 1 refers to the carriage control character. The supported range of values for column is 1 - 32756. ACIF compares the trigger value to the input data. If the specified value exceeds the physical length of the record, ACIF considers the comparison false and continues processing.

**'*triggervalue*' | X'*triggervalue*'**

Specifies the actual alphanumeric or hexadecimal value of the trigger. ACIF does not do any validity checking on this value, but uses it in doing a byte-for-byte comparison with the records in the file. The trigger value can be 1 - 250 bytes. If the combined values of column and the trigger length exceed the physical length of the record, ACIF considers the comparison false and continues processing.

**Note:** The trigger value can be specified as EBCDIC character data or hexadecimal data. However, if the input data file is anything other than EBCDIC, the value *must* be specified as hexadecimal data.

The following example shows how to use a carriage control character as a trigger:

```
TRIGGER1=*,1,'1'              /* Look for Skip-to-Channel 1
TRIGGER2=0,50,'ACCOUNT:'      /* Find account number
TRIGGER3=3,75,'Page 1'        /* Find page
```

In this example, TRIGGER1 instructs ACIF to scan every record, looking for the occurrence of '1' in the first byte. After ACIF locates a record that contains '1', it looks in the same record, starting at byte 50, for the occurrence of 'ACCOUNT:'. If 'ACCOUNT:' is found, ACIF looks at the third record for a value of 'Page 1', starting at byte 75. If 'Page 1' is found, ACIF defines the record that contains TRIGGER1 as the indexing anchor record and all indexing information is specified as relative locations relative from this point.

If ACIF finds either 'ACCOUNT:' or 'Page 1', it begins scanning the first record after the farthest field specified. If 'ACCOUNT:' or 'Page 1' is not found at its specified location relative to TRIGGER1, ACIF begins looking for TRIGGER1 again, starting with the next record (that is, the current record that contains TRIGGER1 + 1).

**Notes:**

1. ACIF requires that at least one TRIGGER*n* or FIELD*n* value appear within the page range that is specified by the INDEXSTARTBY parameter (unless INDEXSTARTBY=0 is specified). If no TRIGGER*n* or FIELD*n* parameter is satisfied within the INDEXSTARTBY page range, ACIF stops processing and issues an error message. If you do not want ACIF to stop processing when it cannot find a group indexing field or when a file is empty, you must set the parameter to INDEXSTARTBY=0 or specify EXTENSIONS=EMPTYOK.
2. At least one TRIGGER*n* or FIELD*n* value must exist on the first page of every unique page group. ACIF cannot detect an error condition if TRIGGER*n* or FIELD*n* is missing, but the output might be incorrectly indexed.
3. TRIGGER1 must be specified when ACIF is requested to index the file.
4. An error condition occurs if you specify any TRIGGER*n* parameters when the input file contains indexing tags.

See Chapter 4, “Enhanced indexing parameters,” on page 67 for information about using the TRIGGER*n* parameter with enhanced ACIF indexing.

## UNIQUEBNGS

Specifies whether ACIF creates a unique group name by generating an 8-character numeric string and appending the string to the group name. The group name that is defined in the Begin Named Page Group (BNG) structured field consists of an index value and a sequence number.

**UNIQUEBNGS={YES | NO}**
The values are:

**YES**
Specifies that ACIF generate an 8-character numeric string and append the string to the group name.

**NO**
ACIF does not generate the string. Specify NO if you use an application such as AFP Toolbox, AFP API, or DCF to generate your own group names.

If UNIQUEBNGS is not specified, ACIF uses YES as the default unless you specify DCFPAGENAMES=YES, in which case ACIF uses NO as the default.

## USERLIB

Specifies the location of AFP resources for processing the input file. This parameter is not used for VSE.

### z/OS

**USERLIB=*dsname1*[,*dsname2*][,*dsname3...*]**
Specifies data sets containing AFP resources for processing the input data set. You can specify a maximum of 16 data sets. For example:

```
USERLIB=USER.IMAGES,USER.AFP.RESOURCES
```

ACIF dynamically allocates these data sets and searches for AFP resources in them in the order that is specified in the USERLIB parameter. If a resource is not found, ACIF searches the appropriate resource libraries that are defined for that resource type (for example, PDEFLIB for page definitions). The libraries that you specify can contain any AFP resources (fonts, page segments, overlays, page definitions, or form definitions). If Resource Access Control Facility (RACF) is installed on your system, RACF checks the authority of the user ID requesting access to a user library (data set). If ACIF is not authorized to allocate the data set, it reports an error condition and ends processing.

**Notes:**

1. The data sets that USERLIB specifies can contain AFP extended code page fonts, which are FOCA fonts that contain EBCDIC or ASCII encodings and can contain the Unicode equivalent value.
2. Because AFP resources (except page segments) have reserved prefixes, naming conflicts most likely do not occur.
3. An inline resource overrides a resource of the same name that is contained in a USERLIB parameter.
4. Data sets must be specified as fully qualified names without quotation marks.
5. For systems before MVS/DFP Version 2.3, data sets must be concatenated with the largest block size first.

### VM

**USERLIB=*filetype1*[,*filetype2*][,*filetype3...*]**
Specifies the file types that define the libraries that contain AFP resources for processing the input file. You can specify a maximum of eight file types. For example:

```
USERLIB=USER3820,TEMPUSER
```

ACIF searches for AFP resources in these file types in the order that is specified in the USERLIB parameter. If a resource is not found, ACIF searches the appropriate resource libraries that are defined for that resource type (for example, PDEFLIB for page definitions). The libraries that you specify can contain any AFP resources (fonts, page segments, overlays, page definitions, or form definitions). If Resource Access Control Facility (RACF) is installed on your system, RACF checks the authority of the user ID requesting access to a user library (data set). If ACIF is not authorized to allocate the data set, it reports an error condition and ends processing.

**Note:** File types must conform to CMS naming conventions.

**VSE**

This parameter is not used for VSE. AFP resources are in the library that is defined by the `// LIBDEF PHASE,SEARCH=(…)` JCL statement. For information about how PSF/VSE selects resources, see *Print Services Facility/VSE: System Programming Guide*.

## USERPATH

Specifies the names of user directories that contain TrueType and OpenType fonts, AFP extended code page fonts, or data object resources that are installed with a resource access table (RAT), such as color management resources (CMRs). TrueType and OpenType fonts are Unicode-enabled AFP fonts that are not defined by FOCA. AFP extended code page fonts are FOCA fonts that contain EBCDIC or ASCII encodings and can contain the Unicode equivalent value. AFP extended code page fonts have a .ECP file extension. For more information about resources that are installed with RATs, see Appendix B, "Processing resources installed with resource access tables," on page 217.

By convention, resources that are specified with the USERPATH parameter are typically used by one user, as opposed to the system resources that are shared by many users (for example, those resources specified with the FONTPATH or OBJCPATH parameters).

This parameter is not supported for VM or VSE; if specified, you see an error message.

**USERPATH=*pathlist***
The value is:

***pathlist***
Any valid search path. You must use a colon (:) to separate multiple paths. For example:

```
INPUTDD=INFILE
OUTPUTDD=OUTFILE
PAGEDEF=PAGTRUE
FORMDEF=F1A10110
USERPATH='/jdoe/fonts/truetype:/jdoe/fonts/truetype/myfonts/'
```

**Note:** To continue a *pathlist* on multiple lines in a parameter file, type the *pathlist* to the last character of the first line and then continue typing in the first column of the next line.

ACIF searches the paths in the order in which they are specified.

**Keep in mind:** The total number of all characters in the string of path names cannot exceed 4095 bytes.

# Chapter 4. Enhanced indexing parameters

You can use enhanced indexing to do these tasks:

- Generate page-level information so you can move to specific pages in a document.
- Define a transaction field and create indexes where ACIF extracts the first and last value from a group or page.
- Define a field that is based on where the trigger is found.
- Define a default value for a field, which is used if the record is not long enough to hold the field.
- Change to a new group when the maximum number of pages is reached.
- Define a floating trigger, which can appear multiple times in a group or not at all, or define a trigger that is found within a range of records.
- Match specific characters that might appear in a field column or match a field mask symbol.

Enhanced ACIF indexing is not supported for ACIF in the VM and VSE environments.

This information describes the ACIF parameters that are used for enhanced indexing functions. To use enhanced indexing in ACIF, you specify the parameters here, in addition to those parameters found in Chapter 3, "ACIF parameters," on page 21. The syntax rules for the enhanced indexing parameters are the same as those rules for z/OS in "Syntax rules for ACIF" on page 21.

## Parameter values for enhanced indexing

Table 4 on page 67 lists the ACIF enhanced indexing parameters and values for PSF for z/OS. Underscored values are the default and are used by ACIF if no other value is specified.

*Table 4: ACIF enhanced indexing parameters*

| **Enhanced Indexing Parameters** | **See Page...** |
|---|---|
| BREAKYES={<u>OR</u> \| AND} | "#unique_39/unique_39_Connect_42_breakyesp" on page 68 |
| FIELD*n*={*record*,*column*,*length*,([TRIGGER=<u>1</u> \| *n*,]BASE=0 \| TRIGGER[,DEFAULT=*value* \| X'*value*'])} | "#unique_187/unique_187_Connect_42_fieldet1p" on page 69 |
| FIELD*n*={*literalvalue* \| X'*literalvalue*'} | "#unique_188/unique_188_Connect_42_fieldecp" on page 70 |

Table 4: ACIF enhanced indexing parameters (continued)

| Enhanced Indexing Parameters | See Page... |
|---|---|
| FIELD*n*={*,*,*length*,(OFFSET=(*start1:end1*[,*start2:end2*][,...*start8:end8*])[,MASK='@ # = ¬ ^ %' \| ,REGEX={'*regularexpression*' \| X'*regularexpression*'}][,ORDER=<u>BYROW</u> \| BYCOL])} | "#unique_41/unique_41_Connect_42_fieldet2p" on page 71 |
| FIELD*n*={*record,column,length,*(TRIGGER=*n*,BASE=0 \| TRIGGER,MASK='@ # = ¬ ^ %'[,DEFAULT=*value* \| X'*value*'])} | "#unique_189/unique_189_Connect_42_fieldemp" on page 73 |
| GROUPMAXPAGES=*nnnn* | "#unique_190/unique_190_Connect_42_grpmxpgp" on page 75 |
| INDEX*n*={'*attributename*' \| X'*attributename*'}{,FIELD*nn*[,FIELD*nn*...]}[,(TYPE={<u>GROUP</u>[,BREAK={<u>YES</u> \| NO}] \| GROUPRANGE \| PAGE \| PAGERANGE})] | "#unique_191/unique_191_Connect_42_indexep" on page 75 |
| TRIGGER*n*={*record* \| *}{,*column* \| *startcolumn:endcolumn* \| *}{(,'*triggervalue*' \| X'*triggervalue*') \| ,REGEX={'*regularexpression*' \| X'*regularexpression*'}}[,(TYPE={<u>GROUP</u> \| GROUP,RECORDRANGE=(*start,end*) \| FLOAT})] | "#unique_42/unique_42_Connect_42_triggerep" on page 77 |
| USERMASK{*n* ,'*symbolvalue*'}{,'*stringvalue*' \| X'*stringvalue*'} | "#unique_192/unique_192_Connect_42_usermskp" on page 80 |

The following information describes the enhanced indexing parameters.

## BREAKYES

Specifies how multiple index parameters that are specified with the BREAK=YES option are interpreted.

**BREAKYES={<u>OR</u> | AND}**
The values are:

**OR**
Specifies that a change to any index value causes the current page to be considered the start of a new document.

**AND**
Specifies that all index values must change for the current page to be considered the start of a new document.

If a value other than AND or OR is specified for BREAKYES, an error message is issued and processing stops.

## FIELDn

Specifies the field that identifies the location of index data and provides default and literal (constant) index values. ACIF supports these types of fields for enhanced indexing:

**Trigger field**
This field is based on the location of a trigger string value.

**Constant field**
This field provides the actual index value that is stored in the database.

**Transaction field**
This field indexes input data that contains one or more columns of sorted data when it is not practical to store every value in the database. (ACIF extracts the beginning and ending sorted values in each group.)

**Mask field**
This field is based on a floating trigger and uses a mask to match data that is in the field columns.

You must define at least one field and you can define a maximum of 32 fields (FIELD1 through FIELD32). When you are adding a field parameter, use the next available number, beginning with "1".

### Trigger field

A trigger field is a field that is based on the location of a trigger string value.

**FIELD*n*={*record*,*column*,*length*,([TRIGGER=<u>1</u> | *n*,]BASE=0 | TRIGGER[,DEFAULT=*value* | X'*value*'])}**
The values are:

***n***
Specifies the field parameter identifier.

***record***
Specifies the relative record number from the trigger on which the field is based. This value is the record number where ACIF begins to search for the field. The supported range of values are ±0 to 255.

***column***
Specifies the relative column number from the BASE value. This value is the column number where ACIF begins to search for the field. A value of "1" refers to the first byte in the record. For files that contain carriage control characters, column one refers to the carriage control. For those applications that use a specific carriage control character to define page boundaries (for example, skip-to-channel 1), consider defining the value of the carriage control character as one of the TRIGGER*n* parameters. If you specify BASE=0, the *column* value can be 1 - 32756. If you specify BASE=TRIGGER, *column* value can be -32756 to 32756.

**Note:** If the specified value exceeds the physical length of the record and you do not specify a DEFAULT value, ACIF reports an error condition and ends processing.

***length***
Specifies the number of contiguous bytes (characters) that compose this field. The supported range of values are 1 - 250. The field can extend outside the record length, if the column where it begins lies within the record length. In this case, ACIF adds padding blanks to complete the record.

**Note:** If the field begins outside the maximum length of the record and you do not specify a DEFAULT value, ACIF reports an error condition and ends processing.

**TRIGGER=<u>1</u> | *n***
Specifies the TRIGGER*n* parameter ACIF uses to locate the field. This parameter is optional. Replace *n* with the number of a defined parameter, such as TRIGGER2.

**BASE=0 | TRIGGER**
Specifies whether ACIF uses the starting column number of the trigger string value to locate the field data. The values are:

**0**

ACIF adds zero to the field column offset. You can use 0 if the field data always starts in a specific column.

**TRIGGER**

ACIF adds the starting column number of the trigger string value to the field column offset. Use TRIGGER if the field data does not always start in a specific column, but is always offset a specific number of columns from the trigger string value. The trigger string value can begin in any column in the record. A field that is based on this trigger occurs in the trigger record.

The field parameter in the following example causes ACIF to locate field values that begin in column 83 of the same record that contains the TRIGGER1 string value. The field length is 8 bytes. BASE=0 is specified because the field data always starts in the same column.

```
TRIGGER1=*,1,'1',(TYPE=GROUP)
FIELD1=0,83,8,(TRIGGER=1,BASE=0)
```

The field parameter in the following example causes ACIF to locate field values that begin 10 columns offset from the trigger string value. By basing the field on TRIGGER2 and specifying BASE=TRIGGER, ACIF can locate the field by adding 10 to the starting column offset of the trigger string value.

```
TRIGGER2=*,*,'ACCOUNT:',(TYPE=FLOAT)
FIELD2=0,10,12,(TRIGGER=2,BASE=TRIGGER)
```

**DEFAULT=*value* | X'*value*'**

Specifies the default value for the index when a record is not long enough to contain the field data because the JES spool removed trailing blanks from the end of the record. The default value can be 1 - 250 bytes.

**Note:** The value can be specified as an EBCDIC character string or hexadecimal data. However, if the input data file is *anything other than* EBCDIC, the value *must* be specified as hexadecimal data (otherwise, the comparisons between the input data file and what is coded in the FIELD*n* parameter do not yield a match).

DEFAULT is used with Download for z/OS, which can transmit data from the JES spool. JES, by default, truncates trailing blanks at the end of records. When ACIF is processing the records that were truncated, it ends with an error unless you specify DEFAULT.

### Constant field

A constant field is a field for which you specify the actual index value that is stored in the database. It is possible to generate an index value by concatenating or combining the literal value that you specify for a constant field with the value that ACIF extracts from a document by using a trigger field. However, the trigger field cannot be based on a floating trigger.

**FIELD*n*={*literalvalue* | X'*literalvalue*'}**

The values are:

***n***

Specifies the field parameter identifier.

***literalvalue* | X'*literalvalue*'**

The actual index value of the field that is stored in the database. The literal value can be 1 - 250 bytes. ACIF does not check the validity of the actual content of the supplied data.

**Note:** The value can be specified as an EBCDIC character string or hexadecimal data. However, if the input data file is *anything other than* single-byte EBCDIC, the value *must* be specified as hexadecimal data (otherwise, the comparisons between the input data file and what is coded in the `FIELD`*n* parameter do not yield a match).

The field parameter in the following example causes ACIF to store the same string of characters in each INDEX3 it creates.

```
FIELD3='251658240'
INDEX3='Account Number',FIELD3,(TYPE=GROUP,BREAK=NO)
```

The field parameters in the following example cause ACIF to concatenate a literal value with the index value extracted from the data. ACIF concatenates the literal value that is specified in the FIELD3 parameter to each index value located by using the FIELD4 parameter. In this example, the application stores the concatenated string value in an OnDemand database. The account number field in the data is 14 bytes. However, the account number in the database is 19 bytes. Use a constant field to concatenate a constant 5-byte prefix (0000–) to all account numbers extracted from the data. The input data is encoded in EBCDIC.

```
FIELD3='00006'
FIELD4=0,66,14
INDEX3='Account Number',FIELD3,FIELD4,(TYPE=GROUP,BREAK=YES)
```

### Transaction field

When you cannot store every value in the OnDemand database, you can use a transaction field to index input data that contains one or more columns of sorted data.

**FIELD*n*={*,*,*length*,(OFFSET=(*start1:end1*[,*start2:end2*][,...*start8:end8*])[, MASK='@ # = ¬ ^ %' | ,REGEX={'*regularexpression*' | X'*regularexpression*'}][,ORDER=BYROW | BYCOL])}**

The values are:

***n***

Specifies the field parameter identifier.

*****

Specifies the record number where ACIF begins searching for the field. A transaction field must specify an asterisk (*), meaning ACIF searches every record in the group.

*****

Specifies the column number where ACIF begins searching for the field. A transaction field must specify an asterisk (*). The OFFSET specification determines the column or columns where ACIF locates the field.

**Note:** If you enter a value other than an asterisk, ACIF ignores the value. When you specify OFFSET, ACIF always uses the starting column numbers from OFFSET to determine the location of the field values.

***length***

Specifies the number of contiguous bytes (characters) that compose this field. The supported range of values are 1 - 250. The field can extend outside the record length, if the column where it begins lies within the record length. In this case, ACIF adds padding blanks to complete the record.

**Note:** If the field begins outside the maximum length of the record, ACIF reports an error condition and ends processing.

**OFFSET=(*start1:end1*[,*start2:end2*][,...*start8:end8*])**

Specifies the location of the field value from the beginning of the record. The start is the column where the field begins. The end is the last column of field data. A maximum of eight pairs of beginning and ending offset values are allowed. Separate the pairs with a comma. When you specify OFFSET, you must also specify MASK. The implied length of OFFSET must be the same as the number of characters in MASK or ACIF cannot detect a match.

**MASK='*@ # = ¬ ^ %'**

Specifies the pattern of symbols that ACIF matches with data in the field columns. When you specify MASK, you must also specify OFFSET. When you define a field that includes a mask, an INDEX parameter that is based on the field cannot reference any other fields. An INDEX parameter that is based on a field that includes a mask must create GROUPRANGE or PAGERANGE type indexes.

**Notes:**

1. You cannot specify MASK with a double-byte or Unicode code page (EXTENSIONS=IDXCPGID), unless you are using code page 1208 and only indexing single-byte characters. MASK does not support the multiple-byte characters of code page 1208 (UTF-8).
2. Either MASK or REGEX can be specified, but not both.

These mask symbols are valid:

*****
Matches a user-defined mask, not a literal asterisk. See “USERMASK” on page 80.

**@**
Matches an alphabetic character.

**#**
Matches a numeric character.

**=**
Matches any character.

**¬**
Matches any non-blank character.

**^**
Matches any non-blank character.

**%**
Matches a blank character or numeric character.

The default code page for the symbols in MASK is 500 for z/OS and 850 for other operating systems. If you specify a different code page (with the CPGID parameter), ACIF translates all characters in the MASK value, except the MASK symbols. ACIF then matches the input characters against the MASK value. In the following example, ACIF searches columns 10 - 17 for a hexadecimal C1 followed by four numeric characters (hexadecimal F0 - F9), a hexadecimal 60, and two numeric characters (hexadecimal F0 - F9):

```
CPGID=500
FIELD3=*,*,8,(OFFSET=(10:17),MASK='A####-##',ORDER=BYROW)
```

**REGEX={'*regularexpression*' | X'*regularexpression*'}**
Specifies the regular expression that ACIF uses to match text. The regular expression must be specified in the code page that is indicated by the CPGID parameter. It can be specified in hexadecimal. The maximum length of the regular expression is 250 bytes.

**Notes:**

1. A mask and a regular expression cannot be specified on the same FIELD parameter.
2. Regular expressions must be enabled by specifying EXTENSIONS=MVSICNV in the parameter file. See “Enabling ICONV translation services and regular expressions” on page 16.

See “Using regular expressions” on page 212 for more information about regular expressions.

**ORDER=BYROW | BYCOL**
Specifies where ACIF can locate the smallest value and the largest value of a group of sorted values that are arranged in either rows or columns on the page. For ORDER=BYROW, ACIF extracts the first value in the first row and the last value in the last row that match the MASK. Data with a row orientation might appear as:

```
1 2 3
4 5 6
7 8
```

For ORDER=BYCOL, ACIF extracts the first value in the first column and the last value in the last column that match the MASK. Data with a column orientation might appear as:

```
1 4 7
2 5 8
3 6
```

The field parameter in the following example causes ACIF to locate a 10-character numeric string that begins in column three of any record in the group. This format of the FIELD parameter is used to create indexes for the beginning and ending sorted values of each group.

```
FIELD4=*,*,10,(OFFSET=(3:12),MASK='##########',ORDER=BYROW)
```

### Mask field

A *mask field* is a field with a mask that is based on a floating trigger. An INDEX parameter that is based on the mask field cannot include any other fields and must not create GROUPRANGE or PAGERANGE type indexes.

**FIELD*n*={*record,column,length,*(TRIGGER=*n*,BASE=0 | TRIGGER,MASK='@ # = ¬ ^ %'[,DEFAULT=*value* | X'*value*'])}**

The values are:

***n***

Specifies the field parameter identifier.

***record***

Specifies the relative record number from the trigger on which the field is based. This value is the record number where ACIF begins to search for the field. The supported range of values are ±0 to 255.

***column***

Specifies the relative column number from the BASE value. This value is the column number where ACIF begins to search for the field. A value of "1" refers to the first byte in the record. For files that contain carriage control characters, column one refers to the carriage control. For those applications that use a specific carriage control character to define page boundaries (for example, skip-to-channel 1), consider defining the value of the carriage control character as one of the TRIGGER*n* parameters. If you specify BASE=0, the *column* value can be 1 - 32756. If you specify BASE=TRIGGER, *column* value can be -32756 to 32756.

**Note:** If the specified value exceeds the physical length of the record and you do not specify a DEFAULT value, ACIF reports an error condition and ends processing.

***length***

Specifies the number of contiguous bytes (characters) that compose this field. The supported range of values are 1 - 250. The field can extend outside the record length, if the column where it begins lies within the record length. In this case, ACIF adds padding blanks to complete the record.

**Note:** If the field begins outside the maximum length of the record and you do not specify a DEFAULT value, ACIF reports an error condition and ends processing.

**TRIGGER=1 | *n***

Specifies the TRIGGER*n* parameter ACIF uses to locate the field. When you are using MASK, you must specify a trigger that is defined with TYPE=FLOAT.

**BASE=0 | TRIGGER**

Specifies whether ACIF uses the starting column number of the trigger string value to locate the field data. The values are:

**0**

ACIF adds zero to the field column offset. You can use 0 if the field data always starts in a specific column.

**TRIGGER**

ACIF adds the starting column number of the trigger string value to the field column offset. Use TRIGGER if the field data does not always start in a specific column, but is always offset a specific number of columns from the trigger string value. The trigger string value can begin in any column in the record. A field that is based on this trigger occurs in the trigger record.

The field parameter in the following example causes ACIF to locate field values that begin in column 83 of the same record that contains the TRIGGER1 string value. The field length is 8 bytes. BASE=0 is specified because the field data always starts in the same column.

```
TRIGGER1=*,1,'1',(TYPE=GROUP)
FIELD1=0,83,8,(TRIGGER=1,BASE=0)
```

The field parameter in the following example causes ACIF to locate field values that begin 10 columns offset from the trigger string value. By basing the field on TRIGGER2 and specifying BASE=TRIGGER, ACIF can locate the field by adding 10 to the starting column offset of the trigger string value.

```
TRIGGER2=*,*,'ACCOUNT:',(TYPE=FLOAT)
FIELD2=0,10,12,(TRIGGER=2,BASE=TRIGGER)
```

**MASK='@ # = ¬ ^ %'**

Specifies the pattern of symbols that ACIF matches with data in the field columns. If the data matches the MASK, ACIF selects the field.

**Note:** You cannot specify MASK with a double-byte or Unicode code page (EXTENSIONS=IDXCPGID), unless you are using code page 1208 and only indexing single-byte characters. MASK does not support the multiple-byte characters of code page 1208 (UTF-8).

These mask symbols are valid:

**@**
Matches an alphabetic character.

**#**
Matches a numeric character.

**=**
Matches any character.

**¬**
Matches any non-blank character.

**^**
Matches any non-blank character.

**%**
Matches a blank character or numeric character.

In the following example. ACIF selects the field only if the data in the field columns contains numeric characters:

```
TRIGGER2=*,25,'SOURCE',(TYPE=FLOAT)
FIELD2=0,38,4,(TRIGGER=2,BASE=0,MASK='####',DEFAULT='4059099376')
```

**DEFAULT=*value* | X'*value*'**

Specifies the default value for the index when a record is not long enough to contain the field data. The default value can be 1 - 250 characters in length.

**Note:** The value can be specified as an EBCDIC character string or hexadecimal data. However, if the input data file is *anything other than* single-byte EBCDIC, the value *must* be specified as hexadecimal data (otherwise, the comparisons between the input data file and what is coded in the FIELD*n* parameter do not yield a match).

DEFAULT is used with Download for z/OS, which can transmit data from the JES spool. JES, by default, truncates trailing blanks at the end of records. When ACIF processes the records that were truncated, it ends with an error unless you specify DEFAULT.

**Note:** The MASK is not applied to the default value.

## GROUPMAXPAGES

Specifies the maximum number of pages that ACIF can put into a group.

**GROUPMAXPAGES=*nnnn***
The value is:

***nnnn***
A 1 - 4 digit number (1 - 9999).

If the maximum number of pages is reached before a group index value is changed, ACIF forces a new group. If you do not specify GROUPMAXPAGES, ACIF does not end the current group and begin a new group until the value of one of the fields that is specified with the BREAK=YES option on the INDEX parameter changes.

When indexing transaction data with a GROUPRANGE index, you typically set the GROUPMAXPAGES parameter to control the maximum number of pages in a group. For more information about the TYPE and BREAK options, see the INDEX parameter in *IBM Content Manager OnDemand for Multiplatforms: Indexing Reference*.

## INDEXn

Specifies the index name, the field or fields on which the index is based, and the type of index ACIF generates. You can define group indexes for AFP and line data. You can define page indexes for AFP data and line data that you convert to AFP. When you define a group index, IBM suggests that you name the index the same as the application group database field name.

**Keep in mind:** Group indexes are stored in the index object file and used to search for documents. Page indexes are stored with the document, not in the index object file. This situation means that you cannot use page indexes to search for documents.

To generate page-level information in the output file so you can go to specific pages in a document, you must specify INDEXOBJ=ALL. You must also create an index field by specifying TYPE=PAGE on the INDEX parameter.

You must define at least one index and you can define a maximum of 32 indexes (INDEX1 through INDEX32). Each index can be made up of one or more FIELD definitions. When you are adding an index parameter, use the next available number, beginning with "1".

**INDEX*n*={'*attributename*' | X'*attributename*'}{,FIELD*nn*[,FIELD*nn*...]}[,(TYPE={<u>GROUP</u> [,BREAK={<u>YES</u> | NO}] | GROUPRANGE | PAGE | PAGERANGE})]**
The values are:

***n***
Specifies the index parameter identifier.

**'*attributename*' | X'*attributename*'**
Specifies a user-defined label to be associated with the actual index value. For example, assume that INDEX1 is a person’s bank account number. The string "Account Number" would be a meaningful attribute name. The value of INDEX1 would be the actual account number (for example, 0001234567). The attribute name can be 1 - 250 bytes.

**Note:** The value can be specified as an EBCDIC character string or hexadecimal data. However, if the input data file is *anything other than* single-byte EBCDIC, the value *must* be specified as hexadecimal data (otherwise, the comparisons between the input data file and what is coded in the INDEX*n* parameter do not yield a match).

**FIELD*nn*[,FIELD*nn*...]**

Specifies one or more FIELD*n* parameters that ACIF uses to locate the index. A maximum of 32 FIELD*n* parameters can be specified for each index. If more than one FIELD*n* parameter is specified, ACIF concatenates them into one physical string of data. No delimiters are used between the concatenated fields. Because an index value has a maximum length of 250 bytes, the total of all specified FIELD*n* parameters for a single index cannot exceed this length. ACIF reports an error condition and ends processing if the length is greater than 250 bytes.

GROUPRANGE and PAGERANGE indexes must name only one transaction field. PAGE indexes must name fields that are based on floating triggers. An index that names a field that is based on a floating trigger must be TYPE=GROUP,BREAK=NO or TYPE=PAGE.

**TYPE={GROUP[,BREAK={YES | NO}] | GROUPRANGE | PAGE | PAGERANGE}**

The type of index ACIF generates. You can define either group or page indexes for AFP and line data. The types are:

**GROUP[,BREAK={YES | NO}]**

The values are:

**GROUP**

Specifies a group index value. ACIF creates one index value for each group. A group index that names a field parameter that is based on a floating trigger must specify BREAK=NO.

**BREAK={YES | NO}**

Specifies whether ACIF includes the index when it is calculating a group break. The values are:

**YES**

ACIF breaks the group when the index value changes.

**NO**

ACIF does not break the group.

The following example indicates that ACIF generates group indexes for date index values. The input data is encoded in EBCDIC.

```
INDEX1='Date Due',FIELD1,(TYPE=GROUP,BREAK=YES)
```

The next example indicates that ACIF generates group indexes for customer name and account number index values. The input data is encoded in EBCDIC. ACIF closes the current group and begins a new group only when the customer name index value changes (the data is sorted by customer name). In this example, a customer might have one or more statements with different account numbers. The page numbers in each statement begin with the number one, giving the appearance of unique statements. The goal is to collect all of a customer's statements in a single group.

```
INDEX1='Customer Name',FIELD1,(TYPE=GROUP,BREAK=YES)
INDEX2='Account Number',FIELD2,(TYPE=GROUP,BREAK=NO)
```

**GROUPRANGE**

Specifies a GROUPRANGE index, which does not break the group. ACIF creates index values for the first and last sorted values in each group. ACIF creates indexes for the group by extracting the first and last values that match the MASK of the transaction field on which the index is based. ACIF assumes that the input values are sorted. You can define one GROUPRANGE index per report.

A GROUPRANGE index must name only one transaction field, cannot name a field parameter that is based on a floating trigger, and cannot break a group.

For a GROUPRANGE index, ACIF can use the value of the GROUPMAXPAGES parameter to determine the number of pages in a group and when to break a group. For example, you need to index a line data report that consists of thousands of pages of sorted transaction data. You define a GROUP index to hold the report date index values and a GROUPRANGE index to hold the transaction numbers for each group. Because every page in the report contains the same date, the GROUP index cannot be used to break the report into groups. (And a GROUPRANGE index cannot be used to break a group.) To break the report into groups, set the GROUPMAXPAGES parameter to the maximum number of pages you want in a group (for example, 100). When ACIF calculates group breaks, it uses the value of the GROUPMAXPAGES parameter to determine when to close the current group and begin a new group.

The following example indicates that ACIF generates GROUPRANGE indexes for loan number index values. ACIF extracts the beginning and ending loan numbers in each group of pages. The input data is encoded in EBCDIC. Because a GROUPRANGE index cannot be used to break a report into groups of page, the GROUPMAXPAGES parameter can be used to determine the number of pages in a group. ACIF closes the current group and begins a new group when the number of pages in the group is equal to the value of the GROUPMAXPAGES parameter.

```
INDEX2='Loan Number',FIELD2,(TYPE=GROUPRANGE)
GROUPMAXPAGES=100
```

**PAGE**

Specifies a page index, which does not break a group. You can create more than one page index per page. Page indexes must name fields that are based on floating triggers, and cannot break a group.

Page indexes are stored with the document, not in the index object file, and cannot be used to search for documents.

To generate page-level information in the output file so you can go to specific pages in a document, you must create an index field by specifying a page index with INDEXOBJ=ALL; otherwise, ACIF does not write the page index data to the index object file.

The following example indicates that ACIF generates PAGE indexes for subtotal values (the attribute name that appears in the Go To dialog box is Subtotal). The input data is encoded in EBCDIC. ACIF extracts the index values from each page.

```
INDEX3='Subtotal',FIELD3,(TYPE=PAGE)
```

**PAGERANGE**

Specifies a PAGERANGE index, which does not break a group. ACIF creates index values for the first and last sorted values on each page. ACIF creates indexes for the page by extracting the first and last values that match the MASK of the transaction field on which the index is based. ACIF assumes that the input values are sorted. You can define one PAGERANGE index per report.

A PAGERANGE index must name only one transaction field, cannot name a field parameter that is based on a floating trigger, and cannot break a group.

PAGERANGE indexes are stored with the document, not in the database, and cannot be used to search for documents. After you retrieve a document, you can use the page indexes to move to a specific page in the document with the Go To command in the client.

To generate page-level information in the output file so you can go to specific pages in a document, you must create an index field by specifying a PAGERANGE index with INDEXOBJ=ALL; otherwise, ACIF does not write the PAGERANGE index data to the index object file.

## TRIGGERn

Specifies locations and values that are required to uniquely identify the beginning of a group and the locations and values of data fields that are used to define indexes. These data fields are referred to as "triggers" because their presence in the file triggers a processing action. You must specify at least one TRIGGER*n* parameter and you can specify a maximum of eight parameters. When you are adding a trigger parameter, use the next available number, beginning with "1".

**TRIGGER*n*={*record* | *}{,*column* | *startcolumn*:*endcolumn* | *}{(,'*triggervalue*' | X'*triggervalue*') | ,REGEX={'*regularexpression*' | X'*regularexpression*'}}[,(TYPE={GROUP | GROUP,RECORDRANGE=(*start,end*) | FLOAT})]**

The values are:

***n***

Specifies the trigger parameter identifier.

***record* | ***

Specifies the input record where ACIF locates the trigger value. You *must* specify an asterisk value (*) for TRIGGER1, record range triggers, and float triggers so that ACIF searches every input record for the trigger value. For other group triggers, the input record is relative to the record that contains the TRIGGER1 value. The supported range of record numbers is 0 - 255.

***column* | *startcolumn*:*endcolumn* | ***

Specifies the byte offset from the beginning of the record where the trigger value is located. The supported range of column values is 0 - 32756. You can specify an asterisk (*) or 0 so that ACIF scans the record from left to right looking for the trigger value. A value of "1" refers to the first byte in the record.

Alternatively, you can specify a column range that is separated by a colon. For example, "2:5" means the trigger can begin in columns 2, 3, 4, or 5.

**Keep in mind:** The column values cannot be zero and the ending column must be greater than the beginning column.

The following example indicates that ACIF matches the "Account Number" value beginning in column 50, 51, or 52 of the sixth input record that follows the TRIGGER1 record. The input data is encoded in EBCDIC.

```
TRIGGER2=6,50:52,X'C1838396A495A340D5A494828599',(TYPE=GROUP)
```

**'*triggervalue*' | X'*triggervalue*'**

Specifies the actual alphanumeric or hexadecimal value of the trigger that ACIF uses to match the input data. The trigger value can be 1 - 250 bytes and is case-sensitive.

**Note:** The trigger value can be specified as EBCDIC character data or hexadecimal data. However, if the input data file is *anything other than* EBCDIC, the value *must* be specified as hexadecimal data.

**REGEX={'*regularexpression*' | X'*regularexpression*'}**

Specifies the regular expression that ACIF uses to match the input data. The regular expression must be specified in the code page that is indicated by the CPGID parameter, and can be 1 - 250 bytes. The regular expression can be specified in hexadecimal.

**Notes:**

1. You can specify either a trigger value or a regular expression, but not both.
2. Regular expressions must be enabled by specifying EXTENSIONS=MVSICNV in the parameter file. See "Enabling ICONV translation services and regular expressions" on page 16.

See "Using regular expressions" on page 212 for more information about regular expressions.

**TYPE={GROUP | GROUP,RECORDRANGE=(*start,end*) | FLOAT**

The trigger type. TRIGGER1 must be a GROUP trigger. The types are:

**GROUP**

Specifies the beginning of a group. In ACIF, a group is a named collection of sequential pages that form a logical subset of an input file. You define only as many group triggers as needed to identify the beginning of a group. In many cases, you need only one group trigger.

A group must contain at least one page, and it can contain all of the pages in an input file. However, most customers define their group triggers so that ACIF can logically divide an input file into smaller parts, such as by statement, policy, bill, or, for transaction data, number of pages.

A group is determined when the value of an index changes (for example, account number) or when the maximum number of pages for a group is reached. ACIF generates indexes for each group in the input file. Because a group cannot be smaller than one page, a group trigger must not appear more than once on a page. See the BREAK option on the INDEX parameter for more information about breaking groups.

The following example indicates that ACIF searches column one of every input record for the occurrence of a skip-to-channel 1 carriage control character. The record value for TRIGGER1 must be an asterisk (*) and TRIGGER1 must be a GROUP trigger. The input data is encoded in EBCDIC.

```
TRIGGER1=*,1,'1',(TYPE=GROUP)
```

The next example indicates that ACIF matches the PAGE 1 value beginning in column two of every input record. The record value for TRIGGER1 must be an asterisk (*) and TRIGGER1 must be a GROUP trigger. The input data is encoded in EBCDIC.

```
TRIGGER1=*,2,'PAGE 1',(TYPE=GROUP)
```

The final example indicates that ACIF matches the "Account Number" value beginning in column fifty of the sixth input record that follows the TRIGGER1 record. The input data is encoded in EBCDIC.

```
TRIGGER2=6,50,'Account Number',(TYPE=GROUP)
```

**GROUP,RECORDRANGE=(*start,end*)**

Specifies field data that is not always in the same record relative to TRIGGER1. ACIF determines the location of the field by searching the specified range of records. The range can be 0 - 255. ACIF stops searching after the first match in the specified range of records. For example, if the range is 5,7 and records six and seven contain the trigger value, ACIF stops searching after it matches the value in record six.

The following example indicates that ACIF locates the "Account Number" value beginning in column 50 within a range of records (the trigger value can occur in records six, seven, or eight following TRIGGER1) in each group. You must specify an asterisk (*) for record number because ACIF uses the record range to determine which records to search for the trigger value. The input data is encoded in EBCDIC.

```
TRIGGER2=*,50,'Account Number',(TYPE=GROUP,RECORDRANGE=(6,8))
```

**FLOAT**

Specifies field data that does not necessarily occur in the same location on each page, the same page in each group, or in each group. ACIF determines the location of the field by searching every input record for the trigger value that starts in the specified column (or every column, if an asterisk is specified). For example, you need to index statements by type of account. Possible types of accounts include savings, checking, loan, and IRA. Because not all statements contain all types of accounts, the number of pages in a statement can vary and the page number where a specific type of account occurs can vary. However, each type of account is preceded by the string "Account Type". Define a float trigger with a trigger string value of "Account Type". The same float trigger can be used to locate all of the accounts that occur in a statement.

The following example indicates that ACIF matches the "Type of Income" value, beginning in column five of every record in the group. You must specify an asterisk (*) for the record number. The input data is encoded in EBCDIC.

```
TRIGGER3=*,5,'Type of Income',(TYPE=FLOAT)
```

**Notes:**

1. ACIF requires that at least one TRIGGER*n* or FIELD*n* value appear within the page range that is specified by the INDEXSTARTBY parameter (unless INDEXSTARTBY=0 is specified). If no TRIGGER*n* or FIELD*n* parameter is satisfied within the INDEXSTARTBY page range, ACIF stops processing and issues an error message. If you do not want ACIF to stop processing when it cannot find a group indexing field or when a file is empty, you must set the parameter to INDEXSTARTBY=0 or specify EXTENSIONS=EMPTYOK.
2. At least one TRIGGER*n* or FIELD*n* value must exist on the first page of every unique page group. ACIF cannot detect an error condition if TRIGGER*n* or FIELD*n* is missing, but the output might be incorrectly indexed.
3. TRIGGER1 must be specified when ACIF is requested to index the file.
4. An error condition occurs if you specify any TRIGGER*n* parameters when the input file contains indexing tags.

## USERMASK

Specifies a user mask that identifies a symbol and string for matching field data.

**USERMASK={*n*,'*symbolvalue*'}{,'*stringvalue*' | X'*stringvalue*'}**
The values are:

***n***
Indicates the number of the user mask. Valid values are 1 - 4.

**'*symbolvalue*'**
Indicates a character that represents the characters in the *stringvalue* or the field mask. All printable characters except # @ = ¬ ^ % are valid. The *symbolvalue* does not match its literal value in the field data. For example, ACIF does not match an asterisk (*) symbol with an * in the field data.

**'*stringvalue*' | X'*stringvalue*'**
Indicates one or more characters you want to match to field data. When the input data file is *anything other than* single-byte EBCDIC, the character string *must* be specified in hexadecimal.

The following example shows how to use USERMASK to match specific characters that might appear in the field column:

```
USERMASK=1,'*','AaBbCc'
FIELD3=*,*,15,(OFFSET=(10:24),MASK='*@@@@@@@@@@@@@@',ORDER=BYROW)
```

In this example, USERMASK causes ACIF to match an uppercase or lowercase A, B, or C in the first position of a 15-character string, such as a name.

A user mask can also match one of the field mask symbols. ACIF reserves the symbols # @ = ¬ ^ % for the field mask. If the field data contains one of the mask symbols, you must define a user mask so that ACIF can find a match. For example,

```
USERMASK=2,'*','%'
FIELD4=*,*,3,(OFFSET=(10:12),MASK='##*',ORDER=BYROW)
```

In this example, ACIF matches a 3-character string that contains two numerics and the percent sign (%), such as 85%.

# Chapter 5. Examples of using ACIF

This information shows examples of how to use ACIF processing parameters for transforming data, retrieving resources, specifying fonts, identifying the location of resource libraries, and drawing graphics with record format page definitions. Detailed examples of how to use ACIF for viewing and indexing a document are described. Examples of using enhanced indexing and indexing UTF-16 data are also described.

## Examples of using ACIF processing parameters

This information shows how you can use ACIF processing parameters to do these tasks:

- Transform line data or XML data into a MO:DCA-P document.
- Retrieve resources.
- Specify AFP coded fonts.
- Specify TrueType and OpenType fonts.
- Identify the location of resource libraries.
- Draw graphics with record format page definitions.

### Transforming line data or XML data into a MO:DCA-P document

You have an EBCDIC line data file named `OLDFILE.1403` or an XML data file named `OLDFILE.xmp` that you want to transform into a MO:DCA-P document named `NEWFILE.afp`. To transform line data or XML data, enter these parameters for your operating system:

```
INPUTDD=OLDFILE
OUTPUTDD=NEWFILE
CCTYPE=A
PAGEDEF=P1A06462
FORMDEF=F1A10110
```

ACIF converts the line data or XML data file, pointed to by the INPUTDD parameter, into a document file pointed to by the OUTPUTDD parameter.

For XML data, CCTYPE is not used. For line data, you specify CCTYPE=A to indicate that the file contains EBCDIC ANSI carriage control characters. The PAGEDEF and FORMDEF parameters are required with your line data input file, so you specify the file names of the page definition and form definition you want ACIF to use in processing this file.

### Retrieving resources

You have an AFP file (`MYFILE`) that contains page segments and overlays. You would like to retrieve the page segments and overlays from the file and create both a data file and a resource file. To retrieve resources, enter these parameters for your operating system:

```
INPUTDD=MYFILE
OUTPUTDD=MYDATA
RESOBJDD=MYRES
RESTYPE=PSEG,OVLY,FDEF
FORMDEF=F1H10110
```

From this job, ACIF produces an AFP document file and a resource file. The AFP document file (`MYDATA`) contains the AFP data from `MYFILE`. The resource file (`MYRES`) contains the resource data from `MYFILE`.

You specify RESTYPE=PSEG,OVLY,FDEF so that the page segments and overlays are included in the resource file, along with the form definition (specified with the FORMDEF parameter) that you want ACIF to use when it is processing the file.

For more information about using ACIF's resource retrieval functions, see "Retrieving resources" on page 7.

## Specifying AFP coded fonts

You have an input file (MYFILE.asc) that contains line data , and you want these three AFP coded fonts to be used in processing the file: Helvetica 10-point, Times New Roman 10-point, and Courier 10-point. (To use any other ASCII coded fonts, you must first create them.) You are using a page definition that is supplied with PSF (P1A06462), and the page definition does not name any fonts.

You specify the font names with the CHARS parameter. To use fonts with the appropriate ASCII code points for your line data input, see Table 5 on page 82, which shows the IBM Core Interchange Font names and their corresponding short names for each of the fonts you want to use: Helvetica 10-point, Times New Roman 10-point, and Courier 10-point. Because the CHARS parameter limits the specification of a font name to four characters, you use the corresponding short name from the table for each of the three fonts.

*Table 5: Font short names to use with CHARS parameter*

| Font Type | Coded Font Name | Short Name |
|---|---|---|
| Helvetica 10-point | X0H23002 | H350 |
| Times New Roman 10-point | X0N23002 | N350 |
| Courier 10-point | X0423002 | 4350 |

Because table reference characters are required in the input file when you want the file to print with more than one font, you specify TRC=YES.

You specify your input and output file names with the INPUTDD and OUTPUTDD parameters. You specify the page definition and form definition you want ACIF to use when it is processing the file with the PAGEDEF and FORMDEF parameters.

To use the three fonts, enter these parameters for your operating system:

```
INPUTDD=MYFILE
OUTPUTDD=MYFILE
CHARS=H350,N350,4350
TRC=YES
PAGEDEF=P1A06462
FORMDEF=F1A10110
```

## Specifying TrueType and OpenType fonts

You have an input file (INFILE) that contains EBCDIC line data. You also have Unicode-enabled TrueType and OpenType fonts that are in user path libraries, such as /jdoe/fonts/truetype, or system path libraries, such as /u/fonts/truetype. TrueType and OpenType fonts are those fonts that are not defined by the Font Object Content Architecture (FOCA).

You want these TrueType and OpenType fonts to be used in processing the file: Arial Black, Century Gothic, and Times New Roman. The page definition (PAGTRUE) you are using references the fonts in Map Data Resource (MDR) structured fields. See *Page Printer Formatting Aid: User's Guide* for information about creating page definitions that use TrueType and OpenType fonts.

You specify your input and output file names with the INPUTDD and OUTPUTDD parameters. You specify the page definition and form definition you want ACIF to use when it is processing the file with the PAGEDEF and FORMDEF parameters. You specify font path libraries with either the USERPATH parameter or the FONTPATH parameter.

To specify the fonts, enter these parameters for your operating system:

```
INPUTDD=INFILE
OUTPUTDD=OUTFILE
PAGEDEF=PAGTRUE
FORMDEF=F1A10110
```

```
USERPATH='/jdoe/fonts/truetype:/jdoe/fonts/truetype/myfonts/'
FONTPATH='/u/fonts/truetype:/u/fonts/truetype/local/'
```

## Identifying the location of resource libraries during processing

You have an input file and you want to use specific resources during processing. You want to use a form definition (FORMD1A) and an overlay that are stored in the general resource library at your location (`SYS1.PSEGLIB`, `/usr/site/resdir`, or `\`*`directory`*`\site\resdir`, where *directory* is the installation directory). To be sure that ACIF finds the resources you want to use, enter these parameters for your operating system:

**z/OS or VM**

```
INPUTDD=INFILE
OUTPUTDD=OUTFILE
PAGEDEF=PAGED6B
FORMDEF=FORMD1A
USERLIB=USER.ART1,USER.ART2
PDEFLIB=USER.PDEFDIR3
```

**VSE**

```
INPUTDD=INFILE
OUTPUTDD=OUTFILE
PAGEDEF=PAGED6B
FORMDEF=FORMD1A
```

**Note:** VSE resources are in the library that is defined by the `// LIBDEF PHASE, SEARCH=(…)` JCL statement.

The page definition that you want to use (PAGED6B) is stored in one of the several page definition libraries that are used by your department (`USER.PDEFDIR3`). The page definition is a copy of one with the same file name that is stored in the site's general resource library, with some modifications made for use by your department.

Your page segments are stored in two other libraries that you set up for your own use (`USER.ART1` and `USER.ART2`).

Because ACIF always searches the path that is specified by the USERLIB parameter first, your page segments are found in your personal libraries. ACIF next searches the paths that are specified by the parameters for specific resource libraries (PDEFLIB, FDEFLIB, and so forth), so ACIF then finds the page definition that you want to use from the department's library.

ACIF does not use the page definition that is named PAGED6B that is stored in `USER.RESDIR` because it already finds the modified PAGED6B in the department library that is specified with the PDEFLIB parameter.

## Drawing graphics with record format page definitions

You have a page definition that you are using to format record format line data. The page definition contains these DRAWGRAPHIC commands to draw colored lines and boxes:

```
DRAWGRAPHIC BOX BOXSIZE 2.6 IN .25 IN ROUNDED LARGE
   LINETYPE SOLID COLOR Green
   FILL ALL SOLID COLOR Blue
DRAWGRAPHIC LINE ACROSS 7.5 IN
   LINEWT BOLD
   LINETYPE SOLID COLOR Red
```

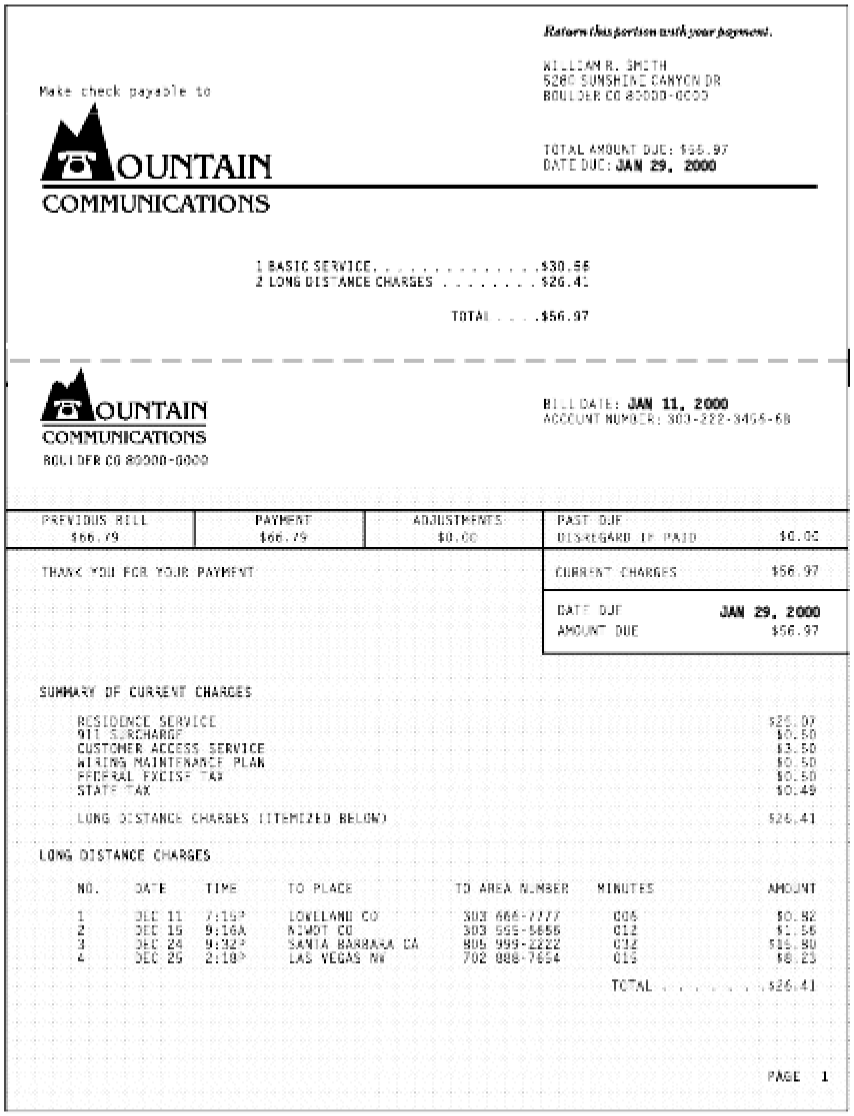
To draw the graphics, enter these options on the EXTENSIONS parameter for your operating system:

```
INPUTDD=INFILE
OUTPUTDD=OUTFILE
EXTENSIONS=PRCOLOR,BOX,FRACLINE
```

```
PAGEDEF=PAGERFLD
FORMDEF=FORMRFLD
```

## Example of using ACIF to view and index documents

A communications company produces monthly telephone bills with a line data application. The company wants to make the billing application output available so that when a customer calls with a billing inquiry, the customer service representatives can view the bill in the same format on their workstations as the customer's printed copy. An example of the customer's printed telephone bill is shown in Figure 13 on page 84.



```
                                                     Return this portion with your payment.

                                                     WILLIAM R. SMITH
                                                     5280 SUNSHINE CANYON DR
Make check payable to                                BOULDER CO 80000-0000

MOUNTAIN                                             TOTAL AMOUNT DUE: $56.97
COMMUNICATIONS                                       DATE DUE: JAN 29, 2000

                                 1 BASIC SERVICE. . . . . . . . . . . . . .$30.56
                                 2 LONG DISTANCE CHARGES . . . . . . . . . $26.41

                                                   TOTAL . . . .$56.97

MOUNTAIN                                             BILL DATE: JAN 11, 2000
COMMUNICATIONS                                       ACCOUNT NUMBER: 303-222-3456-68
BOULDER CO 80000-0000

PREVIOUS BILL      PAYMENT        ADJUSTMENTS     PAST DUE
   $66.79          $66.79           $0.00         DISREGARD IF PAID          $0.00

THANK YOU FOR YOUR PAYMENT                        CURRENT CHARGES            $56.97

                                                  DATE DUE          JAN 29, 2000
                                                  AMOUNT DUE                 $56.97

SUMMARY OF CURRENT CHARGES

    RESIDENCE SERVICE                                                        $25.07
    911 SURCHARGE                                                             $0.50
    CUSTOMER ACCESS SERVICE                                                   $3.50
    WIRING MAINTENANCE PLAN                                                   $0.50
    FEDERAL EXCISE TAX                                                        $0.50
    STATE TAX                                                                 $0.49

    LONG DISTANCE CHARGES (ITEMIZED BELOW)                                   $26.41

LONG DISTANCE CHARGES

    NO.   DATE    TIME    TO PLACE           TO AREA NUMBER   MINUTES        AMOUNT

    1     DEC 11  7:15P   LOVELAND CO         303 666-7777      006           $0.82
    2     DEC 15  9:16A   NIWOT CO            303 555-5656      012           $1.56
    3     DEC 24  9:32P   SANTA BARBARA CA    805 999-2222      032          $15.80
    4     DEC 25  2:18P   LAS VEGAS NV        702 888-7654      015           $8.23
                                                            TOTAL . . . . . . .$26.41

                                                                          PAGE   1
```

*Figure 13: Example of a customer's printed telephone bill*

To meet the communications company's needs, you can use ACIF to do these tasks:

- Convert the output from the line data application into a document format that can be used with the AFP Workbench Viewer.
- Index the file to facilitate searching the file with AFP Workbench Viewer.
- Retrieve resources so that all resources used in the bills are available at the workstation.

You do these tasks to view and index a telephone bill with ACIF:

1. Examine the input file to determine what ACIF parameters are needed to view the telephone bill and whether literal values are expressed as character data strings or hexadecimal strings. See "Examining the input file" on page 85.
2. Specify ACIF parameters in z/OS, VM, or VSE. See "Specifying ACIF processing parameters" on page 87.
3. Index the input data file for data retrieval. See "Indexing data in the input file" on page 90.
4. Identify the locations of the resources that are used when the bill is printed. See "Identifying the locations of the resources in a parameter file" on page 92.
5. Determine the form definition and page definition that is needed to format and print the bill. See "Determining the form definition and the page definition" on page 92.
6. Run the ACIF job to create the output files. See "Running the ACIF job" on page 93.
7. Concatenate the output files. See "Concatenating ACIF output files" on page 93.
8. Access the document file from a workstation for viewing with AFP Workbench Viewer. See "Accessing the document file for viewing" on page 94.

## Examining the input file

Figure 14 on page 86 shows the line data file currently used to print the telephone bill that is shown in Figure 13 on page 84.

**Note:** The line data input file that is provided is hypothetical; it is intended only to help you understand how ACIF can be used for an actual application and to assist you when you use ACIF for your own application. For practical use, you must provide your own input file, and specify paths, directories, and so forth, as they apply to your particular installation and application.

```
    Carriage
    Control
      |
Line  ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 0    1                                                WILLIAM R. SMITH
                                                       5280 SUNSHINE CANYON DR
                                                       BOULDER CO 80000-0000
      -                                                TOTAL AMOUNT DUE: $56.97
                                                       DATE DUE: JAN 29, 2000
 5
      -
      -
      0      1 BASIC SERVICE. . . . . . . . . . . . . .$30.56
             2 LONG DISTANCE CHARGES  . . . . . . . . .$26.41
10    0                                    TOTAL . . . .$56.97
      -
      0                                                BILL DATE: JAN 11, 2000
                                                       ACCOUNT NUMBER: 303-222-3456-6B
      -
15    -   $66.79          $66.79       $0.00                                $0.00
                                                                           $56.97
                                                                     JAN 29, 2000
                                                                           $56.97
      -
20    0 SUMMARY OF CURRENT CHARGES
      0     RESIDENCE SERVICE                                              $25.07
            911 SURCHARGE                                                   $0.50
            CUSTOMER ACCESS SERVICE                                         $3.50
            WIRING MAINTENANCE PLAN                                         $0.50
25          FEDERAL EXCISE TAX                                              $0.50
            STATE TAX                                                       $0.49
            LONG DISTANCE CHARGES (ITEMIZED BELOW)                         $30.56
      0 LONG DISTANCE CHARGES
      0  NO.    DATE     TIME       TO PLACE           TO AREA NUMBER  MINUTES  AMOUNT
30    0  1      DEC 11   7:15P      LOVELAND CO        303 666-7777      006     $0.82
         2      DEC 15   9:16A      NIWOT CO           303 555-6666      012     $1.56
         3      DEC 24   9:32P      SANTA BARBARA CA   805 999-6666      032    $15.80
         4      DEC 25   2:18P      LAS VEGAS NV       702 888-7654      015     $8.23
      -                                                    TOTAL . . . . . . .$26.41
35    -
      -
      0                                                                        PAGE  1
```

*Figure 14: Example of the line data telephone bill*

**Determining how literal values are expressed**

The way literal values in the input file are defined in ACIF parameters depend on whether the input file contains EBCDIC data. If the input file is in EBCDIC, the literal values in the FIELD*n*, INDEX*n*, and TRIGGER*n* parameters can be expressed in character data strings. For example, Figure 15 on page 87 shows part of a parameter file for EBCDIC input data. The CCTYPE parameter value matches the type of data in the input file, in this case EBCDIC. The CPGID parameter indicates a code page for the type of data in the input file. The FIELD*n*, INDEX*n*, and TRIGGER*n* parameters are expressed in character data strings because the input file is EBCDIC.

```
                                                        /* Example phone bill */
                            /* DATA CHARACTERISTICS*/
CC=yes                                                  /* Carriage control used */
CCTYPE=a                                                /* EBCDIC ANSI carriage controls */
CHARS=GT15                                              /* Coded font */
CPGID=037                                               /* Code page identifier */
                            /* FIELD AND INDEX DEFINITION*/
FIELD1=13,66,15                                         /* Account Number data field */
FIELD2=0,50,30                                          /* Name data field */
FIELD3=1,50,30                                          /* Address data field */
FIELD4=2,50,30                                          /* City, State, ZIP data field */
FIELD5=4,60,12                                          /* Literal '1' */
INDEX1='Account Number',FIELD1                          /* 1st index attribute */
INDEX2='Name',FIELD2                                    /* 2nd index attribute */
INDEX3='Address',FIELD3                                 /* 3rd index attribute */
INDEX4='City, State, ZIP',FIELD4                        /* 4th index attribute */
INDEX5='Date Due',FIELD5                                /* 5th index attribute */
                            /* EXIT AND TRIGGER INFORMATION*/
TRIGGER1=*,1,'1'                                        /* 1st trigger */
TRIGGER2=13,50,'ACCOUNT NUMBER'                         /* 2nd trigger */
```

*Figure 15: Example of a parameter file for EBCDIC input data*

If the input data file is not EBCDIC, the literal values in the FIELD*n*, INDEX*n*, and TRIGGER*n* parameters must be expressed in hexadecimal strings. For example, Figure 16 on page 87 shows part of a parameter file for ASCII input data. The CCTYPE parameter value matches the type of data in the input file, in this case ASCII. The CPGID parameter indicates a code page for the type of data in the input file. The FIELD*n*, INDEX*n*, and TRIGGER*n* parameters are expressed in hexadecimal strings because the input file is ASCII.

```
                                                         /* Example phone bill */
                            /* DATA CHARACTERISTICS*/
CC=yes                                                   /* Carriage control used */
CCTYPE=z                                                 /* ASCII ANSI carriage controls */
CHARS=42B2                                               /* Coded font */
CPGID=850                                                /* Code page identifier */
                            /* FIELD AND INDEX DEFINITION*/
FIELD1=13,66,15                                          /* Account Number data field */
FIELD2=0,50,30                                           /* Name data field */
FIELD3=1,50,30                                           /* Address data field */
FIELD4=2,50,30                                           /* City, State, ZIP data field */
FIELD5=X'4153494920484558204C69746572616C'               /* ASCII Hex literal */
INDEX1=X'4163636F756E74204E756D626572',FIELD1            /* 1st index attr (Account Number) */
INDEX2=X'4E616D65',FIELD2                                /* 2nd index attr (Name) */
INDEX3=X'41646472657373',FIELD3                          /* 3rd index attr (Address) */
INDEX4=X'436974792C2053746174652C205A6970',FIELD4        /* 4th index attr (City, State, ZIP)
*/
INDEX5=X'4461746520447565',FIELD5                        /* 5th index attr (Date Due) */
                            /* EXIT AND TRIGGER INFORMATION*/
TRIGGER1=*,1,X'31'                                       /* 1st trigger (1) */
TRIGGER2=13,50,X'4143434F554E54204E554D424552'           /* 2nd trigger (ACCOUNT NUMBER) */
```

*Figure 16: Example of a parameter file for ASCII input data*

## Specifying ACIF processing parameters

You can process the ACIF parameters that are needed to produce the telephone bill by Creating and specifying a parameter file.

The following information shows examples of z/OS, VM, and VSE parameter files for the telephone bill.

### z/OS parameter file

The JCL for a z/OS parameter file is shown in Figure 17 on page 88. This example creates a sequential data set; however, if you need a partitioned data set, change the parameters as follows:

- Set RESFILE=PDS.
- Set the SPACE and DSORG parameters in the DD statement of the data set named by the RESOBJDD parameter to SPACE=(12288,(150,15,15)),DSORG=PO.

Failure to set these parameters as described might produce a RESOBJDD data set that is unusable.

```
//job...   JOB ...
//APKSMAIN EXEC PGM=APKACIF,REGION=8M,TIME=(,30)
//*============================================================*
//* RUN APK, CREATING OUTPUT AND A RESOURCE LIBRARY            *
//*============================================================*
//STEPLIB  DD  DSN=APKACIF.LOAD,DISP=SHR
//INPUT DD  DSN=USER.ACIFEX2.DATA,DISP=SHR
//SYSIN DD *
                                       /* Example phone bill      */
                     /* DATA CHARACTERISTICS                      */
CC = YES                               /* Carriage control used   */
CCTYPE = A                             /* Carriage control type   */
CHARS = GT15
CPGID = 500                            /* Code page identifier    */
                     /* FIELD AND INDEX DEFINITION                */
FIELD1 = 13,66,15                      /* Account Number          */
FIELD2 = 0,50,30                       /* Name                    */
FIELD3 = 1,50,30                       /* Address                 */
FIELD4 = 2,50,30                       /* City, State, ZIP        */
FIELD5 = 4,60,12                       /* Date Due                */
INDEX1 = 'Account Number',FIELD1       /* 1st INDEX attribute     */
INDEX2 = 'Name',FIELD2                 /* 2nd INDEX attribute     */
INDEX3 = 'Address',FIELD3              /* 3rd INDEX attribute     */
INDEX4 = 'City, State, ZIP',FIELD4     /* 4th INDEX attribute     */
INDEX5 = 'Date Due',FIELD5             /* 5th INDEX attribute     */
                     /* INDEXING INFORMATION                      */
INDEXOBJ = ALL
                     /* RESOURCE INFORMATION                      */
FORMDEF = F1A10110                     /* Formdef name            */
PAGEDEF = P1A08682                     /* Pagedef name            */
FDEFLIB = SYS1.FDEFLIB
FONTLIB = SYS1.FONTLIBB,SYS1.FONTLIBB.EXTRA
OBJCONLIB = USER.PSEGLIB
OVLYLIB = SYS1.OVERLIB
PDEFLIB = SYS1.PDEFLIB
PSEGLIB = SYS1.PSEGLIB
RESFILE = SEQ                          /* Resource file type      */
RESTYPE = FDEF,PSEG,OVLY               /* Resource type selection */
                     /* FILE INFORMATION                          */
INDEXDD = INDEX                        /* Index file ddname       */
INPUTDD = INPUT                        /* Input file ddname       */
OUTPUTDD = OUTPUT                      /* Output file ddname      */
RESOBJDD = RESLIB                      /* Resource file ddname    */
                     /* EXIT AND TRIGGER INFORMATION              */
TRIGGER1 = *,1,'1'                     /* 1st TRIGGER             */
TRIGGER2 = 13,50,'ACCOUNT NUMBER:'     /* 2nd TRIGGER             */
/*
//OUTPUT DD DSN=APKACIF.OUTPUT,DISP=(NEW,CATLG),
//         SPACE=(32760,(150,150),RLSE),UNIT=SYSDA,
//         DCB=(LRECL=32756,BLKSIZE=32760,RECFM=VBM,DSORG=PS)
//INDEX DD DSN=APKACIF.INDEX,DISP=(NEW,CATLG),
//         SPACE=(32760,(15,15),RLSE),UNIT=SYSDA,
//         DCB=(LRECL=32756,BLKSIZE=32760,RECFM=VBM,DSORG=PS)
//RESLIB DD DSN=APKACIF.RESLIB,DISP=(NEW,CATLG),
//         SPACE=(32760,(150,150),RLSE),UNIT=SYSDA,
//         DCB=(LRECL=32756,BLKSIZE=32760,RECFM=VBM,DSORG=PS)
//SYSPRINT DD DSN=APKACIF.SYSPRINT,DISP=(NEW,CATLG),
//         SPACE=(9044,(15,15),RLSE),UNIT=SYSDA,
//         DCB=(LRECL=137,BLKSIZE=1374,RECFM=VBA,DSORG=PS)
```

*Figure 17: Example of a z/OS parameter file*

## VM parameter file

The CMS commands for a VM parameter file are shown in Figure 18 on page 89.

```
FILEDEF INPUT DISK ACIFEX2 SYSIN A
FILEDEF OUTPUT DISK APKACIF OUTPUT A (LRECL 32756 BLKSIZE 32760 RECFM VB
FILEDEF INDEX DISK APKACIF INDEX A (LRECL 32756 BLKSIZE 32760 RECFM VB
FILEDEF RESLIB DISK APKACIF RESLIB A (LRECL 32756 BLKSIZE 32760 RECFM VB
FILEDEF SYSPRINT DISK APKACIF SYSPRINT A
APKACIF

Where file ACIFEX2 SYSIN A contains the following:
                                       /* Example phone bill        */
                     /* DATA CHARACTERISTICS                        */
 CC = YES                              /* Carriage control used     */
 CCTYPE = A                            /* Carriage control type     */
 CHARS = GT15
 CPGID = 500                           /* Code page identifier      */
 FDEFLIB = FDEF3820,FDEF38PP
                     /* INDEXING INFORMATION                        */
 FIELD1 = 13,66,15                     /* Account Number            */
 FIELD2 = 0,50,30                      /* Name                      */
 FIELD3 = 1,50,30                      /* Address                   */
 FIELD4 = 2,50,30                      /* City, State, ZIP          */
 FIELD5 = 4,60,12                      /* Date Due                  */
 INDEX1 = 'Account Number',FIELD1      /* 1st INDEX                 */
 INDEX2 = 'Name',FIELD2                /* 2nd INDEX                 */
 INDEX3 = 'Address',FIELD3             /* 3rd INDEX                 */
 INDEX4 = 'City, State, ZIP',FIELD4    /* 4th INDEX                 */
 INDEX5 = 'Date Due',FIELD5            /* 5th INDEX                 */
                     /* FILE INFORMATION                            */
 INDEXDD = INDEX                       /* Index file ddname         */
 INPUTDD = INPUT                       /* Input file ddname         */
 OUTPUTDD = OUTPUT                     /* Output file ddname        */
 RESOBJDD = RESLIB                     /* Resource file ddname      */
                     /* RESOURCE INFORMATION                        */
 FORMDEF = F1A10110                    /* Formdef name              */
 PAGEDEF = P1A08682                    /* Pagedef name              */
 FONTLIB = FONT3820,FONT38PP
 OBJCONLIB = OBJC3820
 OVLYLIB = OVLY3820,OVLY38PP
 PDEFLIB = PDEF3820,PDEF38PP
 PSEGLIB = PSEG3820,PSEG38PP
 RESFILE = SEQ                         /* Resource file type        */
 RESTYPE = FDEF,PSEG,OVLY              /* Resource type selection   */
                     /* EXIT AND TRIGGER INFORMATION                */
 TRIGGER1 = *,1,'1'                    /* 1st TRIGGER               */
 TRIGGER2 = 13,50,'ACCOUNT NUMBER:'    /* 2nd TRIGGER               */
```

*Figure 18: Example of a VM parameter file*

## VSE parameter file

The JCL for a VSE parameter file is shown in Figure 19 on page 90.

```
// JOB
// LIBDEF PHASE,SEARCH=(PRD2.AFP)
// ASSGN  SYSLST,X'FEE'
// ASSGN  SYS006,201
// DLBL   INPUT,'APKACIF.INPUT',0,SD
// EXTENT SYS006,SYSWK1,1,1,9200,13
// ASSGN  SYS007,201
// DLBL   OUTPUT,'APKACIF.OUTPUT',0,SD
// EXTENT SYS007,SYSWK1,1,1,9213,45
// ASSGN  SYS008,201
// DLBL   RESOBJ,'APKACIF.RESLIB',0,SD
// EXTENT SYS008,SYSWK1,1,1,9258,15
// ASSGN  SYS009,201
// DLBL   INDEX,'APKACIF.INDEX',0,SD
// EXTENT SYS009,SYSWK1,1,1,9273,15
// EXEC   PGM=APKACIF,SIZE=548K

                    /* DATA CHARACTERISTICS                     */
 CC = YES                          /* Carriage control used     */
 CCTYPE = A                        /* Carriage control type     */
 CHARS = GT15
 CPGID = 500                       /* Code page identifier      */
                    /* FIELD AND INDEX DEFINITION               */
 FIELD1 = 13,66,15                 /* Account Number            */
 FIELD2 = 0,50,30                  /* Name                      */
 FIELD3 = 1,50,30                  /* Address                   */
 FIELD4 = 2,50,30                  /* City, State, ZIP          */
 FIELD5 = 4,60,12                  /* Date Due                  */
 INDEX1 = 'Account Number',FIELD1  /* 1st INDEX                 */
 INDEX2 = 'Name',FIELD2            /* 2nd INDEX                 */
 INDEX3 = 'Address',FIELD3         /* 3rd INDEX                 */
 INDEX4 ='City, State, ZIP',FIELD4 /* 4th INDEX                 */
 INDEX5 = 'Date Due',FIELD5        /* 5th INDEX                 */
                    /* FILE INFORMATION                         */
 INDEXDD = INDEX                   /* Index file ddname         */
 INPUTDD = INPUT                   /* Input file ddname         */
 OUTPUTDD = OUTPUT                 /* Output file ddname        */
 RESOBJDD = RESOBJ                 /* Resource file ddname      */
                    /* RESOURCE INFORMATION                     */
 FORMDEF  = F1A10110               /* Formdef name              */
 PAGEDEF  = P1A08682               /* Pagedef name              */
 RESFILE = SEQ                     /* Resource file type        */
 RESTYPE  = FDEF,PSEG,OVLY         /* Resource type selection   */
                    /* EXIT AND TRIGGER INFORMATION             */
 TRIGGER1 = *,1,'1'                /* 1st TRIGGER               */
 TRIGGER2 = 13,50,'ACCOUNT NUMBER:'/* 2nd TRIGGER               */
/*
/&
```

*Figure 19: Example of a VSE parameter file*

## Indexing data in the input file

The parameter file that you create runs the ACIF program to index the input file.

**Note:** ACIF does not look for indexing information in PTOCA objects or Unicode complex text, and does not use PTOCA text controls to index the file.

The example in Figure 15 on page 87 uses these data values as the indexing attributes:

- Account Number
- Name
- Address
- City, State, ZIP
- Date Due

You must specify the ACIF indexing parameters so that the first page of each bill includes group-level indexing tags that contain the values of all five of these attributes.

To generate the indexing attributes:

1. Specify the TRIGGER1 parameter because ACIF always scans for the data that is specified in TRIGGER1 first. Because the data contains carriage control characters, include a carriage control character of ‘1’ to indicate a new page. ACIF locates the start of a page by searching every record in the file for a trigger value of ‘1’ in column 1 of the data. Specify this parameter:

   ```
   TRIGGER1 = *,1,'1'
   ```

   When ACIF finds a record that contains a ‘1’ in column 1, that record becomes the indexing anchor record.
2. Define subsequent TRIGGER*n* parameters relative to the indexing anchor record. In this example, you want to ensure that the page that is indexed is the first page of the bill, which is the only page in the bill that has the text ‘ACCOUNT NUMBER’ starting at byte 50 in the 13th record that follows the anchor record. To specify this additional trigger for locating the correct page to index, enter:

   ```
   TRIGGER2 = 13,50,'ACCOUNT NUMBER'
   ```

   ACIF uses both trigger values to locate a place in the file to begin searching for the data that is supplied in the INDEX*n* parameters.
3. Specify the attribute name of the first indexing parameter as 'Account Number', and define the location of the attribute value in the data relative to the index anchor record set by TRIGGER1. Because the data value for the Account Number attribute is in the 13th record from the index anchor record that starts in byte 66 and extends for 15 bytes, specify:

   ```
   FIELD1=13,66,15
   INDEX1='Account Number',FIELD1
   ```
4. Define 'Name' as the indexing attribute to create the indexing tag for the Name attribute. Locate the value for ‘Name’ in the anchor record in the data that starts at byte 50 and extends for 30 bytes. Specify these ACIF parameters:

   ```
   FIELD2=0,50,30
   INDEX2='Name',FIELD2
   ```
5. Repeat this process to specify the other three indexing tags so that the index attributes and values are defined as follows:

   - `INDEX1='Account Number',FIELD1`
     - `'Account Number'` is the first index attribute
     - `FIELD1` maps to the FIELD1 index value, which is:
       - 13 lines down from the indexing anchor record
       - 66 columns across
       - 15 bytes
   - `INDEX2='Name',FIELD2`
     - `'Name'` is the second index attribute
     - `FIELD2` maps to the FIELD2 index value, which is:
       - 0 lines down (in the indexing anchor record)
       - 50 columns across
       - 30 bytes
   - `INDEX3='Address',FIELD3`
     - `'Address'` is the third index attribute
     - `FIELD3` maps to the FIELD3 index value, which is:
       - 1 line down from the indexing anchor record
       - 50 columns across

        - 30 bytes
- `INDEX4='City, State, ZIP',FIELD4`
    - `'City, State, ZIP'` is the fourth index attribute
    - `FIELD4` maps to the `FIELD4` index value, which is:
        - 2 lines down from the indexing anchor record
        - 50 columns across
        - 30 bytes
- `INDEX5='Date Due',FIELD5`
    - `'Date Due'` is the fifth index attribute
    - `FIELD5` maps to the `FIELD5` index value, which is:
        - 4 lines down from the indexing anchor record
        - 60 columns across
        - 12 bytes

The result of using these indexing parameters is that the first page of each bill in the ACIF output file contains indexing tags for each of the five indexing attributes. Using AFP Workbench Viewer, customer service representatives can locate a single customer bill in the ACIF document by using any combination of the indexing attributes.

## Identifying the locations of the resources in a parameter file

To build the resource file, you must specify the resource libraries in the parameter file so ACIF knows where to find the resources that are specified in the job. The parameter file examples for the telephone bill (Figure 17 on page 88, Figure 18 on page 89, and Figure 19 on page 90) define these resource libraries:

**FDEFLIB**
Form definition library

**FONTLIB**
Font library

**OBJCONLIB**
Object container library

**OVLYLIB**
Overlay library

**PDEFLIB**
Page definition library

**PSEGLIB**
Page segment and BOCA, GOCA, IOCA , and PTOCA object library

**Note:** Resource files that are processed by ACIF must contain a X'5A' carriage control character at the start of each structured field.

## Determining the form definition and the page definition

To format and print the job, specify form definition and page definition resources in the parameter file. The parameter file examples for the telephone bill (Figure 17 on page 88, Figure 18 on page 89, and Figure 19 on page 90) define these resources:

**FORMDEF**
F1A10110, a standard form definition that is provided with PSF.

**PAGEDEF**
P1A08682, a standard page definition that is provided with PSF.

## Running the ACIF job

Run the ACIF job, depending on your operating system:

**z/OS and VSE**
Run a batch job by using the JCL you created for the parameter file (see Figure 17 on page 88 and Figure 19 on page 90).

**VM**
Run the CMS command for the parameter file you created (see Figure 18 on page 89).

ACIF processes the parameters that you specified in the parameter file and creates output files. Table 6 on page 93 shows the output files that ACIF creates for z/OS, VM, and VSE.

*Table 6: Output files ACIF creates*

| Type of File | z/OS and VSE | VM |
|---|---|---|
| Document file, including indexing structured fields | APKACIF.OUTPUT | APKACIF OUTPUT |
| Index object file | APKACIF.INDEX | APKACIF INDEX |
| Resource file | APKACIF.RESLIB | APKACIF RESLIB |
| Message file listing:<br>• ACIF parameters used<br>• Resources used<br>• Return code | APKACIF.SYSPRINT | APKACIF SYSPRINT |

## Concatenating ACIF output files

To use AFP Workbench Viewer to view the document file on a workstation, you must first concatenate the resource file, the index object file, and the document file to create a MO:DCA print file. The order of the files in the concatenated file must be:

1. Resource file
2. Index object file
3. Document file

**Note:** The concatenated file can contain only a single resource file, but multiple index and document files. For example, one resource file (RESDATA), two index object files (INDXOBJ1 and INDXOBJ2), and two document files (OUTDOC1 and OUTDOC2) can be concatenated in this order:

```
RESDATA INDXOBJ1 OUTDOC1 INDXOBJ2 OUTDOC2
```

For information about the print file structure, see *Mixed Object Document Content Architecture Reference*.

### z/OS files

This example shows the z/OS JCL that you can use to concatenate files:

```
//PRINT EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSIN    DD DUMMY
//SYSUT1   DD DSN=APKACIF.RESLIB,DISP=SHR
//         DD DSN=APKACIF.INDEX,DISP=SHR
//         DD DSN=APKACIF.OUTPUT,DISP=SHR
//SYSUT2   DD DSN=NEW.PRINT.OBJECT,DISP=(NEW,CATLG),
//         UNIT=SYSDA,SPACE=(32760,nnn),
//         DCB=(LRECL=32756,BLKSIZE=32760,RECFM=VBM)
```

Where *nnn* is equal to the size of the resource file, plus the size of the index object file, plus the size of the document file.

**Note:** The resource file must be created by specifying RESFILE=SEQ.

#### VM files

This example shows the VM CMS commands that you can use to concatenate files:

```
COPY APKACIF RESLIB A APKACIF INDEX A APKACIF OUTPUT A APKACIF LIST3820 A (APPEND
```

#### VSE files

VSE does not supply a utility for concatenating ACIF output files; you must write your own program.

### Accessing the document file for viewing

To view the concatenated document file with AFP Workbench Viewer, you must access the file from a workstation that is running Microsoft Windows. To access the file, transfer the document file, in binary format, to the workstation where AFP Workbench Viewer is installed.

**Note:** TCP/IP must be installed on both the z/OS, VM, or VSE system and the workstation system where AFP Workbench Viewer is installed.

You can use the File Transfer Protocol (FTP) program to transfer the concatenated document file to the workstation where Microsoft Windows and AFP Workbench Viewer are installed:

1. From the drive and directory of the workstation where you want to save the document file, enter the FTP command and the name of your z/OS, VM, or VSE system:

   ```
   ftp systemname
   ```
2. Enter your system user name.
3. Enter the password for your system user name.
4. To access the directory where the concatenated document file is located, enter:

   ```
   cd directoryname
   ```
5. To transfer the file in binary format, enter:

   ```
   bin
   ```
6. To transfer a concatenated document file that is named NEWFILE, enter:

   ```
   get NEWFILE
   ```

   The file is copied to the workstation, where you can open it for viewing with AFP Workbench Viewer.
7. To exit the FTP program, enter:

   ```
   ftp bye
   ```

## Example of using enhanced indexing with ACIF

You can use enhanced indexing in ACIF to view and index a report, such as a telephone bill. The tasks that you do are the same as those tasks described in “Example of using ACIF to view and index documents” on page 84. The following information shows a telephone bill and the ACIF enhanced indexing parameter file that is needed to view and index the bill.

### Enhanced indexing telephone bill

Figure 20 on page 95 shows an example of a customer's telephone bill.

```
1DETAIL REPORT                         TELECOMMUNICATIONS STATEMENT FOR PERIOD OF JUNE 2005                           PAGE  0001
                              FOR:     APPLE, ANNIE

 SUBGROUP SEQ     4020                                                                                 DIVISION    SALES
 ACCOUNT                                                                                               GROUP SEQ   006
                                                                                                       DEPARTMENT  3517
 APPLE, ANNIE

                                                  CALLS VIA PHONE NETWORK
                            --------------------------------------------------------------------------
                            DATE  TIME  ORIGINATION  DESTINATION  DAC    NUMBER      MIN      CHARGES
                            06-02 08:03 DXSD PLT5    WILLOW GRV PA    215 555-4100     1        .28
                            06-02 08:24 DXSD PLT5    MEMPHIS    TN    901 555-3293     2        .55
                            06-02 08:46 DXSD PLT5    NASHVILLE  TN    615 555-2000     3        .82
                            06-02 09:23 DXSD PLT5    PHILA      PA    215 555-3573    12       3.22
                            06-02 09:35 DXSD PLT5    COLUMBIA   SC    803 555-6781     4       1.08
                            06-02 09:46 DXSD PLT5    COLUMBIA   SC    803 555-6781     2        .55
                            06-02 09:48 DXSD PLT5    BOUNDBROOK NJ    201 555-2939    13       3.49
                            06-02 10:01 DXSD PLT5    NEW YORK   NY    212 555-2470     6       1.62
                            06-02 10:06 DXSD PLT5    NEW YORK   NY    212 555-2470     5       1.35
                            06-02 10:12 DXSD PLT5    INDIANAPLS IN    317 555-2533     5       1.35
                            06-02 10:40 DXSD PLT5    CHARLESTON WV    204 555-7000     8       2.15
                            06-02 10:47 DXSD PLT5    CLEVELAND  OH    216 555-1744     4       1.08
                            06-02 11:01 DXSD PLT5    CLEVELAND  OH    216 555-1744     2        .55
                            06-02 13:09 DXSD PLT5    DETROIT    MI    313 555-8889     5       1.35
                            06-02 13:28 DXSD PLT5    COLUMBIA   SC    803 555-3580     5       1.35
                            06-02 14:51 DXSD PLT5    COLUMBIA   SC    803 555-3743     2        .55
                            06-02 14:57 DXSD PLT5    COLUMBIA   SC    803 555-3580    17       4.56
                            06-02 18:47 DXSD PLT5    BIRMINGHAM MI    313 555-9143     1        .21
                            06-03 10:00 DXSD PLT5    COLUMBIA   SC    803 555-3580     5       1.35
                            06-03 10:10 DXSD PLT5    COLUMBIA   SC    803 555-3580     5       1.35
                            06-03 10:33 DXSD PLT5    PICORIVERA CA    213 555-7426     1        .29
                            06-03 14:48 DXSD PLT5    PICORIVERA CA    213 555-7426     6       1.43
                            06-03 15:22 DXSD PLT5    PITTSBURGH PA    412 555-2536     2        .55
                            06-03 16:10 DXSD PLT5    IRVINE     CA    714 555-4933     1        .27
                            06-03 16:15 DXSD PLT5    HNTNGTNBCH CA    714 555-6488    14       3.05
                            06-03 16:29 DXSD PLT5    IRVINE     CA    714 555-4933     4        .92
                            06-03 16:34 DXSD PLT5    KALAMAZOO  MI    616 555-0478     3        .82
                            06-03 16:36 DXSD PLT5    IRVINE     CA    714 555-4933     3        .70
                            06-03 16:39 DXSD PLT5    PICORIVERA CA    213 555-7426     3        .75
                            06-03 16:41 DXSD PLT5    WLOSANGELS CA    213 555-5000     7       1.76
                            06-03 16:47 DXSD PLT5    IRVINE     CA    714 555-0170     3        .70
                            06-04 08:03 DXSD PLT5    WILLOW GRV PA    215 555-4133     1        .28
                            06-04 08:24 DXSD PLT5    MEMPHIS    TN    901 555-3293     2        .55
                            06-04 08:46 DXSD PLT5    NASHVILLE  TN    615 555-2000     3        .82
                            06-04 09:23 DXSD PLT5    PHILA      PA    215 555-3573    12       3.22
                            06-04 09:35 DXSD PLT5    COLUMBIA   SC    803 555-6781     4       1.08
                            06-04 09:46 DXSD PLT5    COLUMBIA   SC    803 555-6781     2        .55
                            06-04 09:48 DXSD PLT5    BOUNDBROOK NJ    201 555-2939    13       3.49
                            06-04 10:01 DXSD PLT5    NEW YORK   NY    212 555-2470     6       1.62
                            06-04 10:06 DXSD PLT5    NEW YORK   NY    212 555-2470     5       1.35
                            06-04 10:12 DXSD PLT5    INDIANAPLS IN    317 555-2533     5       1.35

1DETAIL REPORT                         TELECOMMUNICATIONS STATEMENT FOR PERIOD OF JUNE 2005                           PAGE  0002
                              FOR:     APPLE, ANNIE

 SUBGROUP SEQ     4020                                                                                 DIVISION    SALES
 ACCOUNT                                                                                               GROUP SEQ   006
                                                                                                       DEPARTMENT  3517
 APPLE, ANNIE                                           (CONTINUED)
                                                  CALLS VIA PHONE NETWORK
                            --------------------------------------------------------------------------
                            DATE  TIME  ORIGINATION  DESTINATION  DAC    NUMBER      MIN      CHARGES
                            06-04 10:22 DXSD PLT5    LOMBARD    IL    312 555-1717     9       2.42
                            06-04 11:08 DXSD PLT5    LOSANGELES CA    213 555-4732    21       5.12
                            06-04 11:53 DXSD PLT5    KANSASCITY KS    913 555-1400     4       1.08
                            06-04 12:18 DXSD PLT5    PICORIVERA CA    213 555-7426    15       4.09
                            06-04 14:38 DXSD PLT5    INDIANAPLS IN    317 555-2533    15       4.15
                            06-04 15:12 DXSD PLT5    SAN DIEGO  CA    619 555-3133     5        .17
                            06-04 15:35 DXSD PLT5    BOULDER    CO    303 555-1442     8       2.15
                            06-05 10:42 DXSD PLT5    PITTSBURGH PA    412 555-2536    11       2.95
                            06-05 12:04 DXSD PLT5    PONTIAC    MI    313 555-5184    17       4.56
                            06-05 13:06 DXSD PLT5    BIRMINGHAM MI    313 555-9143    13       3.49
                            06-06 08:46 DXSD PLT5    MINNEAPOLS MN    612 555-2984     4       1.08
                            06-06 12:51 DXSD PLT5    PITTSBURGH PA    412 555-3090     3        .82
                            06-06 12:57 DXSD PLT5    MINNEAPOLS MN    612 555-2984     1        .28
                            06-06 13:13 DXSD PLT5    MINNEAPOLS MN    612 555-2984     5       1.35
                            06-06 13:19 DXSD PLT5    PITTSBURGH PA    412 555-3090    10       2.69
                            06-06 13:28 DXSD PLT5    PITTSBURGH PA    412 555-3090     7       1.88
                            06-06 14:28 DXSD PLT5    PITTSBURGH PA    412 555-2536     8       2.15
                            06-06 10:12 DXSD PLT5    INDIANAPLS IN    317 555-2533     5       1.35
                            06-09 08:03 DXSD PLT5    WILLOW GRV PA    215 555-4133     1        .28
                            06-09 08:24 DXSD PLT5    MEMPHIS    TN    901 555-3293     2        .55
                            06-09 08:46 DXSD PLT5    NASHVILLE  TN    615 555-2000     3        .82
                            06-09 09:23 DXSD PLT5    PHILA      PA    215 555-3573    12       3.22
                            06-09 09:35 DXSD PLT5    COLUMBIA   SC    803 555-6781     4       1.08
                            06-09 09:46 DXSD PLT5    COLUMBIA   SC    803 555-6781     2        .55
                            06-09 09:48 DXSD PLT5    BOUNDBROOK NJ    201 555-2939    13       3.49
                            06-09 10:01 DXSD PLT5    NEW YORK   NY    212 555-2470     6       1.62
                            06-09 10:06 DXSD PLT5    NEW YORK   NY    212 555-2470     5       1.35
                            06-09 10:12 DXSD PLT5    INDIANAPLS IN    317 555-2533     5       1.35
                            06-09 10:40 DXSD PLT5    CHARLESTON WV    204 555-7000     8       2.15
                            06-09 10:47 DXSD PLT5    CLEVELAND  OH    216 555-1744     4       1.08
                            06-09 11:01 DXSD PLT5    CLEVELAND  OH    216 555-1744     2        .55
                            06-09 13:09 DXSD PLT5    DETROIT    MI    313 555-8889     5       1.35
                            06-09 13:28 DXSD PLT5    COLUMBIA   SC    803 555-3580     5       1.35
                            06-09 14:51 DXSD PLT5    COLUMBIA   SC    803 555-3743     2        .55
                            06-09 14:57 DXSD PLT5    COLUMBIA   SC    803 555-3580    17       4.56
                            06-09 18:47 DXSD PLT5    BIRMINGHAM MI    313 555-9143     1        .21
```

*Figure 20: Example of the enhanced indexing telephone bill*

## Enhanced indexing parameter file

The JCL for a z/OS enhanced indexing parameter file is shown in Figure 21 on page 96. This example creates a sequential data set; however, set these parameters if you need a partitioned data set:

- `RESFILE=PDS`
- SPACE and DSORG parameters in the DD statement of the data set named by the RESOBJDD parameter to `SPACE=(12288,(150,15,15)),DSORG=PO`

Failure to set these parameters as described might produce a RESOBJDD data set that is unusable.

```
CC=YES
CCTYPE=A
  CPGID=500
  INPUTDD  = INPUT
   INDEXDD  = INDEX
   MSGDD    = SYSPRINT
   OUTPUTDD = OUTPUT
   /*TRACE    = YES
   RESOBJDD = RESOURCE
INDEXSTARTBY=7
INDEXOBJ=ALL
 FORMDEF  = F1IBM
TRIGGER1=*,1,X'F1'
TRIGGER2=0,125,X'F0F0F0F1'                    /* Anchor point top-of-page
TRIGGER3=0,2,X'C4C5E3'                        /* Anchor point for DET
TRIGGER4=*,60,X'C6D6C9',(TYPE=FLOAT)
TRIGGER5=*,60,X'C6D6D9',(TYPE=FLOAT)
FIELD1=6,2,20                                 /* Pick up name
FIELD2=5,116,4                                /* Pick up department number
FIELD3=4,116,3                                /* Pick up group name
FIELD4=3,19,4                                 /* Pick subgroup number
FIELD5=0,92,10,(TRIGGER=4)                    /* Pick up total using trigger2
FIELD6=0,92,10,(TRIGGER=5)                    /* Pick up total using trigger2
/* INDEX1='NAME',  FIELD1                     /* Put literal in index
INDEX1=X'D5C1D4C5',  FIELD1                   /* Put literal in index
/* INDEX2='Dept',  FIELD2                     /* Put literal in index
INDEX2=X'C4C5D7E3',  FIELD2                   /* Put literal in index
/*INDEX3='SubGroup',FIELD3                    /* Put literal in index
INDEX3=X'E2E4C2C7D9D6E4D7',FIELD3             /* Put literal in index
/* INDEX4='GROUP',FIELD4                      /* Put literal in index
INDEX4=X'C7D9D6E4D7',FIELD4                   /* Put literal in index
/* INDEX5='TOTAL',FIELD5                      /* Put literal in index
INDEX5=X'E3D6E3C1D3',FIELD5                   /* Put literal in index
INDEX6=X'E3D6E3C1D3F6',FIELD6,(TYPE=PAGE)     /* Put literal in index
PAGEDEF  = P1C09182
TRC=NO
RESFILE=SEQ
RESTYPE=ALL
/* PAGEDEF  = P1STD1
 FDEFLIB = SYS1.FDEFLIB,ACIF.REGRESS.RESLIB
 FONTLIB = FONTS.FONTLIB,FONTS.FONTLIBB,FONTS.FONTLIBB.EXTRA,
           ACIF.REGRESS.RESLIB
 OVLYLIB = SYS1.OVERLIB
 PDEFLIB = SYS1.PDEFLIB,ACIF.REGRESS.RESLIB
 PSEGLIB = SYS1.PSEGLIB
```

*Figure 21: Example of an enhanced indexing parameter file*

## Example of using ACIF with UTF-16 data

Figure 22 on page 97 shows an example of a report that you need to index. The data in the report is encoded in 16-bit little endian Unicode Transformation Format (UTF-16LE).

```
1REPORT 540                           THE BAXTER BAY BANK              PRODUCED 08/14/90
LABOR COST CURRENT ANALYSIS                                                     PAGE   1
ACTUAL COMPARED TO LAST YEAR ACTUAL
MONTH - 07/31/90                                                                     YEAR-TO-DATE
LAST YEAR      VARIANCE                                                              LAST YEAR       VARIANCE
ACTUAL       ACTUAL      DOLLARS     PCT.            ACCOUNT TITLES                   ACTUAL       ACTUAL      DOLLARS    PCT.
4,365,566    3,860,315   505,252     13.1       701003 REGULAR SALARIES              29,906,680   26,723,014  3,183,666   11.9
   89,005       79,868     9,137     11.4       702004 SALARY EXPENSE                   608,986      601,361      7,625
1.3
  138,524      106,241    32,282     30.4       703108 PART TIME SALARIES             1,053,898      801,605    252,293   31.5
  133,030       77,688    55,342     71.2       703207 TREFOIL TEMPS                    662,699      403,588    259,111
64.2
   99,033       38,306    60,727    158.5       705004 OVERTIME                         647,830      258,896    388,934
150.2
      667        1,133       467CR   41.2-      705007 OVERTIME SALARIES                  9,026        8,958         68
0.8
   51,123       51,356       233CR    0.5-      707802 SALARIES-FOREIGN OFFICE          364,460      342,014     22,447
6.6
  101,158       20,775    80,383    386.9       921007 CONTRACT EMPLOYMENT              283,050      132,783    150,267
113.2
4,978,106    4,235,682   742,424     17.5       TOTAL LABOR                          33,536,629   29,272,219  4,264,411   14.6
```

*Figure 22: Example of report with UTF-16 data*

Figure 23 on page 97 shows an example of a parameter file that you can use to index UTF-16 data. Although the data is little endian UTF-16, the index names and extracted values must be big endian UTF-16. Also, you must specify the EXTENSIONS=IDXCPGID parameter.

```
CC=YES
CCTYPE=Z
CPGID=1200
MCF2REF=CPCS
TRC=NO
TRIGGER1=*,1,X'31',(TYPE=GROUP)                         /* 1            */
TRIGGER2=0,3,X'5200450050004F0052005400',(TYPE=GROUP)   /* R E P O R T  */
FIELD1=0,16,6,(TRIGGER=1,BASE=0)
FIELD2=1,106,54,(TRIGGER=1,BASE=0)
FIELD3=3,44,16,(TRIGGER=1,BASE=0)
FIELD4=X'0031'
INDEX1=X'004E0075006D006200650072',FIELD1,(TYPE=GROUP,BREAK=YES) /* Number */
INDEX2=X'005400690074006C0065',FIELD2,(TYPE=GROUP,BREAK=YES)     /* Title  */
INDEX3=X'00720064006100740065',FIELD3,(TYPE=GROUP,BREAK=YES)     /* rdate  */
INDEX4=X'0053006500630074069006F006E',FIELD4,(TYPE=GROUP,BREAK=NO)/*section*/
DCFPAGENAMES=NO
UNIQUEBNGS=YES
IMAGEOUT=ASIS
INDEXOBJ=GROUP
INDEXSTARTBY=1
INSERTIMM=NO
EXTENSIONS=IDXCPGID
RESTYPE=NONE
inputdd=apkivp.utf16.txt
outputdd=apkivp.utf16.out
indexdd=apkivp.utf16.ind
```

*Figure 23: Example of a parameter file for UTF-16 input data*

# Chapter 6. User exits and input print file attributes

During ACIF processing, you can use a user exit to run a user-written program and then, after the user-written program ends, return control of processing to ACIF. ACIF provides data at each exit that can serve as input to the user-written program.

This information contains programming interface information and describes the four user programming exits provided with ACIF. It also describes the information ACIF provides to the exits about the input print file attributes.

## User programming exits

ACIF provides these sample programming exits so you can customize the program:

- Input record
- Index record
- Output record
- Resource

Sample z/OS, VM, or VSE DSECTs are shown in the following information for each programming exit.

Using the programming exits is optional. You specify the names of the exit programs with the INPEXIT, INDXEXIT, OUTEXIT, and RESEXIT parameters, which are described in Chapter 3, "ACIF parameters," on page 21.

**Note:** If ACIF receives a nonzero return code from any exit program, ACIF issues message APK412I and stops processing.

To obtain ACIF sample code for z/OS, VM, and VSE exits, see z/OS Print (github.com/IBM/IBM-Z-zOS).

### Input record exit

ACIF provides an exit that you can use to add, delete, or modify records in the input file. You can also use the exit to insert indexing information. The program that is run by this exit is defined in the INPEXIT parameter.

This exit is called after each record is read from the input file and before any further processing is done on the input record. The exit can request that the record is discarded, modified, processed, or a record is added before the input record. When processing continues, the exit is called for the input record if a new record was added or for the next input record. The largest record that can be processed is 32756 bytes. This exit is not called when ACIF is processing resources from libraries.

**Note:** ACIF issues message APK419S with Return Code 999 (RC=999) and stops processing if the input exit returns a zero length record.

The EXTENSION=PASSPF parameter controls whether a Begin Print File (BPF) and End Print File (EPF) structured field pair that the input record exit tries to insert is actually inserted. If PASSPF is not specified and the input record tries to insert a BPF/EPF pair, the attempt fails and the pair is discarded.

In a MO:DCA-P document, indexing information can be passed in the form of a Tag Logical Element (TLE) structured field (see "Tag Logical Element (TLE) structured field" on page 219 for more information). The exit program can create these structured fields while ACIF is processing the print file. You can insert No Operation (NOP) structured fields into the input file in place of TLEs and use ACIF's indexing parameters (FIELD*n*, INDEX*n*, and TRIGGER*n*) to index the NOPs. You can use this alternative instead of modifying the application in cases where the indexing information is not consistently present in the application output.

**Note:** TLEs are not supported in line data, XML data, or mixed-mode data.

Figure 24 on page 100 contains a sample DSECT that describes the control block for z/OS, VM, or VSE exit programs.

```
PARMLIST DSECT          Parameters for the input record exit
WORK@    DS    A        Address of 16-byte static work area
PFATTR@  DS    A        Address of print-file-attribute information
RECORD@  DS    A        Address of the input record
         DS    A        Reserved for future use
RECORDLN DS    H        Length of the input record
         DS    H        Reserved for future use
REQUEST  DS    X        Add, delete, or process the record
EOF      DS    C        EOF indicator
PARMLIST END
```

*Figure 24: Sample input record exit DSECT*

The address of the control block that contains the following parameters is passed to the input record exit. The address is passed in a standard parameter list pointed to by register 1.

**`WORK@` (Bytes 1–4)**
A pointer to a static, 16-byte memory block. The exit program can use this parameter to save information across calls (for example, pointers to work areas). The 16-byte work area is aligned on a fullword boundary and is initialized to binary zeros before the first call. The user-written exit program must provide the code that is required to manage this work area.

**`PFATTR@` (Bytes 5–8)**
A pointer to the print file attribute data structure. For more information about the format of this data structure and the information it contains, see "Attributes of the input print file" on page 106.

**`RECORD@` (Bytes 9–12)**
A pointer to the first byte of the input record that includes the carriage control character. The record is in buffer storage that is allocated by ACIF, but the exit program is allowed to modify the input record.

**`RESERVED1` (Bytes 13-16)**
These bytes are reserved for future use.

**`RECORDLN` (Bytes 17–18)**
The number of bytes (length) of the input record. If the input record is modified, this parameter must also be updated to reflect the actual length of the record.

**Note:** ACIF issues message APK419S with Return Code 999 (RC=999) and stops processing if the input exit returns a zero length record.

**`RESERVED2` (Bytes 19–20)**
These bytes are reserved for future use.

**`REQUEST` (Byte 21)**
An indication of how the record is to be processed by ACIF. On entry to the exit program, this parameter is X'00'. When the exit program returns control to ACIF, this parameter must have the value X'00', X'01', or X'02', where:

**X'00'**
Specifies that the record is to be processed by ACIF.

**X'01'**
Specifies that the record is not to be processed by ACIF.

**X'02'**
Specifies that the record is to be processed by ACIF and that control is returned to the exit program so it can insert the next record. The exit program can set this value to save the current record, insert a record, and then supply the saved record at the next call. After the exit inserts the last record, the exit program must reset the REQUEST byte to X'00'.

A value of X'00' on entry to the exit program specifies that the record is to be processed. If you want to ignore the record, change the REQUEST byte value to X'01'. If you want the record to be processed, and you want to insert an extra record, change the REQUEST byte value to X'02'. Any value greater than X'02' is interpreted as X'00', and the exit processes the record.

**Note:** Only one record can be in the buffer at any time.

**`EOF` (Byte 22)**
An end-of-file (EOF) indicator. This indicator is a 1-byte character code that specifies whether an EOF condition is encountered. When EOF is signaled (EOF=Y), the last record is already presented to the input exit, and the input file is closed. The pointer RECORD@ is no longer valid. Records cannot be inserted when EOF is signaled. These values are the only valid values for this parameter:

**Y**
Specifies that EOF is encountered.

**N**
Specifies that EOF is not encountered.

The exit program uses the end-of-file indicator to do some additional processing at the end of the print file. The exit program cannot change this parameter.

## Index record exit

You can use an index record exit in ACIF to modify or ignore the records that ACIF writes in the index object file. The program that is run by this exit is defined by the INDXEXIT parameter.

This exit receives control before a record (structured field) is written to the index object file. The exit program can request that the record is ignored or processed. The largest record that can be processed is 32752 bytes (this number does not include the record descriptor word).

Figure 25 on page 101 contains a sample DSECT that describes the control block that is passed to the z/OS, VM, or VSE exit program.

```
PARMLIST DSECT           Parameters for the output record exit
WORK@    DS    A         Address of 16-byte static work area
PFATTR@  DS    A         Address of print-file-attribute information
RECORD@  DS    A         Address of the record to be written
RECORDLN DS    H         Length of the output record
REQUEST  DS    X         Delete or process the record
EOF      DS    C         Last call indicator to ACIF
PARMLIST END
```

*Figure 25: z/OS, VM, or VSE sample index record exit DSECT*

The address of the control block that contains the following parameters is passed to the index record exit. The address is passed in a standard parameter list pointed to by register 1.

**`WORK@` (Bytes 1–4)**
A pointer to a static, 16-byte memory block. The exit program can use this parameter to save information across calls (for example, pointers to work areas). The 16-byte work area is aligned on a fullword boundary and is initialized to binary zeros before to the first call. The user-written exit program must provide the code that is required to manage this work area.

**`PFATTR@` (Bytes 5–8)**
A pointer to the print file attribute data structure. For more information about the format of this data structure and the information it contains, see “Attributes of the input print file” on page 106.

**`RECORD@` (Bytes 9–12)**
A pointer to the first byte of the index record that includes the carriage control character. The record is in a 32 KB buffer (where KB equals 1024 bytes). The buffer is in storage that is allocated by ACIF, but the exit program is allowed to modify the index record.

**`RECORDLN` (Bytes 13–14)**
The length, in bytes, of the index record. If the index record is modified, this parameter must also be updated to reflect the actual length of the record.

**REQUEST (Byte 15)**

An indication of how the record is to be processed by ACIF. On entry to the exit program, this parameter is X'00'. When the exit program returns control to ACIF, this parameter must have the value X'00' or X'01' where:

**X'00'**
Specifies that the record is to be processed by ACIF.

**X'01'**
Specifies that the record is not to be processed by ACIF.

A value of X'00' on entry to the exit program specifies that the record is to be processed. If you want to ignore the record, change the REQUEST byte value to X'01'. Any value greater than X'01' is interpreted as X'00' and the exit processes the record.

**Note:** Only one record can be in the buffer at any time.

**EOF (Byte 16)**

An end-of-file (EOF) indicator. This indicator is a 1-byte character code that signals when ACIF is finished processing the index object file.

When EOF is signaled (EOF=Y), the last record is already presented to the index exit. The pointer RECORD@ is no longer valid. Records cannot be inserted when EOF is signaled. These values are the only valid values for this parameter:

**Y**
Specifies that the last record is written.

**N**
Specifies that the last record is not written.

This end-of-file flag, which is used as a last call indicator, returns control to ACIF. The exit program cannot change this parameter.

## Output record exit

Using the output record exit, you can modify or ignore the records ACIF writes into the output document file. The program that is run by this exit is defined by the OUTEXIT parameter.

The exit receives control before a record (structured field) is written to the output document file. The exit can request that the record is ignored or processed. If the record is ignored, ACIF does not write it to the output document file. The largest record that the exit can process is 32752 bytes, not including the record descriptor word. The exit is not called when ACIF is processing resources.

Figure 26 on page 102 contains a sample DSECT that describes the control block that is passed to the z/OS, VM, or VSE exit program.

```
PARMLIST DSECT          Parameters for the output record exit
WORK@    DS    A        Address of 16-byte static work area
PFATTR@  DS    A        Address of print-file-attribute information
RECORD@  DS    A        Address of the record to be written
RECORDLN DS    H        Length of the output record
REQUEST  DS    X        Delete or process the record
EOF      DS    C        Last call indicator
PARMLIST END
```

*Figure 26: z/OS, VM, or VSE sample output record exit DSECT*

The address of the control block that contains the following parameters is passed to the output record exit. The address is passed in a standard parameter list pointed to by register 1.

**WORK@ (Bytes 1–4)**

A pointer to a static, 16-byte memory block. The exit program can use this parameter to save information across calls (for example, pointers to work areas). The 16-byte work area is aligned on a fullword boundary and is initialized to binary zeros before to the first call. The user-written exit program must provide the code that is required to manage this work area.

**`PFATTR@` (Bytes 5–8)**
A pointer to the print file attribute data structure. For more information about the format of this data structure and the information that is contained in it, see "Attributes of the input print file" on page 106.

**`RECORD@` (Bytes 9–12)**
A pointer to the first byte of the output record. The record is in a 32 KB buffer (where KB equals 1024 bytes). The buffer is in storage that is allocated by ACIF, but the exit program is allowed to modify the output record.

**`RECORDLN` (Bytes 13–14)**
The length, in bytes, of the output record. If the output record is modified, this parameter must also be updated to reflect the actual length of the record.

**`REQUEST` (Byte 15)**
An indication of how the record is to be processed by ACIF. On entry to the exit program, this parameter is X'00'. When the exit program returns control to ACIF, this parameter must have the value X'00' or X'01', where:

**X'00'**
Specifies that the record is to be processed by ACIF.

**X'01'**
Specifies that the record is not to be processed by ACIF.

A value of X'00' on entry to the exit program specifies that the record is to be processed. If you want to ignore the record, change the REQUEST byte value to X'01'. Any value greater than X'01' is interpreted as X'00' and the exit processes the record.

**Keep in mind:** When the record is ignored, ACIF does not write it to the output document file, which means that if any Index Element (IEL) structured fields in the index have byte offsets defined for the ignored record, the index file is no longer valid. Therefore, if the output document file and the index file from ACIF are stored in Content Manager OnDemand, do not use the exit to ignore records. If you do, the indexing information is not valid.

**Note:** Only one record can be in the buffer at any time.

**`EOF` (Byte 16)**
An end-of-file (EOF) indicator. This indicator is a 1-byte character code that signals when ACIF is finished writing the output file.

When EOF is signaled (EOF=Y), the last record is already presented to the output exit. The pointer RECORD@ is no longer valid. Records cannot be inserted when EOF is signaled. These values are the only valid values for this parameter:

**Y**
Specifies that the last record is written.

**N**
Specifies that the last record is not written.

This end-of-file flag, which is used as a last-call indicator, returns control to ACIF. The exit program cannot change this parameter.

## Resource exit

You can use a resource exit in ACIF to "filter" resources so they are not included in the resource file. If you want to exclude a specific type of resource (for example, an overlay), you can control it with the RESTYPE parameter. This exit is useful in controlling resources at the file name level. For example, assume that you are going to send ACIF output to PSF and you only wanted to send those fonts that were not included with the PSF product. You can code this exit program to contain a table of all fonts included with PSF and filter those fonts from the resource file. Security is another consideration for using this exit because you can prevent certain named resources from being included. The program that is run by this exit is defined by the RESEXIT parameter.

This exit receives control before a resource is read from a library. The exit program can request that the resource is processed or ignored (skipped), but it cannot substitute another resource name in place of the requested one. If the exit requests that any overlay to be ignored, ACIF automatically ignores any resources the overlay references (that is, fonts and page segments).

Figure 27 on page 104 contains a sample DSECT that describes the control block that is passed to the z/OS, VM, or VSE exit program.

```
PARMLIST DSECT          Parameters for the output record exit
WORK@    DS    A        Address of 16-byte work area
PFATTR@  DS    A        Address of print file attributes
RESNAME  DS    CL8      Resource object name (long)
RESTYPE  DS    X        Resource type indicator
REQUEST  DS    X        Use or ignore action code
EOF      DS    X        Last call flag
RESNAMEL DS    H        Length of resource name
RESERVED DS    CL3      Reserved
RESNAMF  DS    CL250    Resource name if more than 8 bytes
PARMLIST END
```

*Figure 27: z/OS, VM, or VSE sample resource exit DSECT*

The address of the control block that contains the following parameters is passed to the resource exit. The address is passed in a standard parameter list pointed to by register 1.

**WORK@ (Bytes 1–4)**
A pointer to a static, 16-byte memory block. The exit program can use this parameter to save information across calls (for example, pointers to work areas). The 16-byte work area is aligned on a fullword boundary and is initialized to binary zeros before to the first call. The user-written exit program must provide the code that is required to manage this work area.

**PFATTR@ (Bytes 5–8)**
A pointer to the print file attribute data structure. For more information about the format of this data structure and the information that is presented, see "Attributes of the input print file" on page 106.

**RESNAME (Bytes 9–16)**
The name of the resource to be included. This name can be a file or member name for AFP resources up to 8 characters. For resources names of more than 8 characters, use RESNAMF. The resource type field defines how the RESNAME is interpreted.

**RESTYPE (Byte 17)**
The type of resource the name refers to. This value is a 1-byte hexadecimal where:

**X'03'**
Specifies a GOCA (graphics) object.

**X'05'**
Specifies a BCOCA (bar code) object.

**X'06'**
Specifies an IOCA (IO image) object.

**X'40'**
Specifies a font character set.

**X'41'**
Specifies a code page.

**X'42'**
Specifies a coded font.

**X'92'**
: Specifies an object container (also applies to color management resources (CMRs) and TrueType and OpenType font objects).

**X'9B'**
: Specifies a PTOCA (presentation text) object.

**X'FB'**
: Specifies a page segment.

**X'FC'**
: Specifies an overlay.

ACIF does not call this exit for these resource types:

**Page definition**
: The page definition (PAGEDEF) is a required resource for processing line data, XML data, and mixed-mode data. The page definition is never included in the resource file.

**Form definition**
: The form definition (FORMDEF) is a required resource for processing print files. If you do not want the form definition included in the resource file, specify RESTYPE=NONE or explicitly exclude it from the RESTYPE list.

**Coded fonts**
: If MCF2REF=CF is specified, coded fonts are included in the resource file. Otherwise, ACIF does not include any referenced coded fonts in the resource file; therefore, resource filtering is not applicable. ACIF needs to process coded fonts to determine the names of the code pages and font character sets they reference, which is necessary to create MCF-2 structured fields.

**COM setup files**
: A COM setup file is a required resource for processing microfilm files (*microfilm* can mean either microfiche or 16 mm film). If you do not want a setup file that is included in the resource file, specify RESTYPE=NONE or explicitly exclude OBJCON from the RESTYPE list.

**Color mapping tables**
: A color mapping table (COLORMAP) is used to map color values from a source color space to a target color space. If you do not want a color mapping table included in the resource file, specify RESTYPE=NONE or explicitly exclude OBJCON from the RESTYPE list.

**`REQUEST (Byte 18)`**
: An indication of how the resource is to be processed by ACIF. On entry to the exit program, this parameter is X'00'. When the exit program returns control to ACIF, this parameter must have the value X'00' or X'01' where:

**X'00'**
: Specifies that the resource is to be processed by ACIF.

**X'01'**
: Specifies that the resource is not to be processed by ACIF.

A value of X'00' on entry to the exit program specifies that ACIF processes the resource. If you want to ignore the resource, change the REQUEST byte value to X'01'. Any value greater than X'01' is interpreted as X'00' and the exit processes the resource.

**`EOF (Byte 19)`**
: An end-of-file (EOF) indicator. This indicator is a 1-byte character code that signals when ACIF is finished writing the resource file.

When EOF is signaled (EOF=Y), the last record is already presented to the resource exit. The pointer RECORD@ is no longer valid. Records cannot be inserted when EOF is signaled. These values are the only valid values for this parameter:

**Y**
: Specifies that the last record is written.

**N**
: Specifies that the last record is not written.

This end-of-file flag, which is used as a last-call indicator, returns control to ACIF. The exit program cannot change this parameter.

**RESNAMEL (Bytes 20–21)**
The actual length of the meaningful characters in RESNAME and RESNAMF.

**RESERVED (Bytes 22-24)**
Reserved bytes used for padding or future use.

**RESNAMF (Bytes 25–274)**
The name of the resource to be included if more than 8 characters. This name can be a full font name for TrueType or OpenType fonts (up to 250 Unicode characters), color management resources (CMRs), or any resources that are installed in the system by using resource access table (RAT) entries (see Appendix B, "Processing resources installed with resource access tables," on page 217 for more information about RATs.). The resource type field defines how the RESNAMF is interpreted.

## User exit search order

When ACIF loads a specified user exit program during initialization, the operating system determines the search order and method that is used to locate these load modules.

### z/OS

Exit load modules can be in a load library that is used as STEPLIB, JOBLIB, or in a system library. ACIF uses the standard z/OS search order to locate the exit load module; that is, it looks first in the STEPLIB, then in the JOBLIB, and finally in the system libraries.

### VM

ACIF uses standard CMS search order to locate the specified user exit load module; that is, *name*.TEXT or *name*.TEXTLIB.

### VSE

Exit load modules are in the library that is defined by the `// LIBDEF PHASE,SEARCH=(…)` JCL statement.

## Attributes of the input print file

ACIF provides information about the attributes of the input print file in a data structure available to ACIF's user exits.

Figure 28 on page 106 shows a sample DSECT that describes the format of the z/OS, VM, or VSE data structure.

```
PFATTR   DSECT            Print File Attributes
CC       DS    CL3        Carriage controls? - 'YES' or 'NO '
CCTYPE   DS    CL1        Carriage control type - A (ANSI) or M (Machine)
CHARS    DS    CL20       CHARS values, including commas (eg. GT12, GT15)
FORMDEF  DS    CL8        Form Definition (FORMDEF)
PAGEDEF  DS    CL8        Page Definition (PAGEDEF)
PRMODE   DS    CL8        Processing mode
TRC      DS    CL3        Table Reference Characters - 'YES' or 'NO '
PFATTR   END
```

*Figure 28: z/OS, VM, or VSE sample print file attributes DSECT*

The address of the control block that contains the following parameters is passed to the input record exit. The address is passed in a standard parameter list pointed to by register 1.

**CC (Bytes 1–3)**
The value of the CC parameter as specified in the ACIF processing parameter file. ACIF uses the default value if this parameter is not explicitly specified.

**CCTYPE (Byte 4)**
The value of the CCTYPE parameter as specified in the ACIF processing parameter file. ACIF uses the default value if this parameter is not explicitly specified.

**CHARS (Bytes 5–24)**
The value of the CHARS parameter as specified in the ACIF processing parameter file, including any commas that separate multiple font specifications. Because the CHARS parameter has no default value, this field contains blanks if no values are specified.

**FORMDEF (Bytes 25–32)**
The value of the FORMDEF parameter as specified in the ACIF processing parameter file. Because the FORMDEF parameter has no default value, this field contains blanks if no value is specified.

**PAGEDEF (Bytes 33–40)**
The value of the PAGEDEF parameter as specified in the ACIF processing parameter file. Because the PAGEDEF parameter has no default value, this field contains blanks if no value is specified.

**PRMODE (Bytes 41–48)**
The value of the PRMODE parameter as specified in the ACIF processing parameter file. Because the PRMODE parameter has no default value, this field contains blanks if no value is specified.

**TRC (Bytes 49–51)**
The value of the TRC parameter as specified in the ACIF processing parameter file. ACIF uses the default value if this parameter is not explicitly specified.

**Notes:**

1. Each of the previous character values is left-aligned, with padding blanks added to the right-end of the string. For example, if PAGEDEF=P1TEST is specified in the ACIF processing parameter file, the page definition value in the data structure is P1TESTbb.
2. Exit programs cannot change the values that are supplied in this data structure. For example, if P1TEST is the page definition value, and an exit program changes the value to P1PROD, ACIF still uses P1TEST.
3. This data structure is provided for informational purposes only.

# Chapter 7. ACIF messages

ACIF prints a message list at the end of each compilation. A return code of 0 means that ACIF completed processing without any errors.

**Note:** ACIF messages contain instructions for the PSF system programmer. Show your system programmer these messages because they might not be contained in the PSF messages publication.

## Message identifiers

ACIF issues the same messages for z/OS, VM, and VSE users. The format of the message identifier is APK*nnnnt*. The description of the message identifier format is:

**APK**
Identifies an ACIF message.

***nnnn***
Specifies the 3 - 4 digit message number.

***t***
Specifies an error condition:

**S**
Severe error that causes ACIF to stop processing the current print file. The exact method of stopping can vary. For certain severe errors, an abend occurs with a return code and reason code. This error is generally the case when some system service fails. In other cases, ACIF ends processing with the appropriate error messages written to the message file specified when you started ACIF. Most error conditions that are detected by ACIF fall into the severe category.

**W**
Warning error that ACIF issues when the fidelity of the document (assuming it is reprinted) might be in question.

**I**
Informational error that ACIF issues when it processes a print file so that the operator or application programmer can determine whether the correct processing parameters are specified. These messages can help provide an audit trail.

## Multiple message scenarios

ACIF can issue more than one error message as a result of a single error condition. These situations are limited to the area of parsing the structured field (for example, determining the length and type of the structured field). Some possible scenarios include these message numbers:

- 105, 108, 109, 103
- 105, 108, 110, 103
- 106, 108, 109, 103
- 106, 108, 110, 103

Any subset of the listed message numbers is also possible, if you start with the first one (for example, 105, 108, 109 or 105, 108, or 105, 110). The first message accurately describes the error condition; any subsequent messages provide more information. Additional error messages might not always be accurate.

Message number 101 can occur after many error conditions because ACIF attempts to locate the end of the resource that contains the error as part of its recovery procedure.

## General messages

General error messages are not limited to a particular resource, which is why they are considered general error conditions. Although some general errors are limited to a few resources, others can occur in any resource.

**APK104S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: *structuredfield* STRUCTURED FIELD IS NOT ALLOWED OR FORMS AN INVALID SEQUENCE.**

### Explanation

The structured field identified in this message is either out of sequence or not valid in an object. For example, if an End Print File (EPF) structured field is found, a Begin Print File (BPF) structured field must precede it. The record might be line data. If inline resources are used with data set header pages, multiple resource groups might be present.

This message can be is issued if your AFP input file contains IM1 image with no Image Raster Data (IRD) structured field. This type of AFP file might be built by DCF when shaded text with a shading percentage of zero is created.

If this message is preceded by message APK420S, the error is caused by a missing resource object.

### System action

ACIF stops processing the print data set.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information on the correct format of the referenced structured field. If the structured fields are in the correct order, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK105I THE ERROR REPORTED ABOVE OCCURRED IN LOGICAL RECORD NUMBER *recordnumber*, WHOSE SEQUENCE NUMBER IS *sequencenumber*, AND RESOURCE NAME IS *resourcename*.**

### Explanation

This message is given in addition to the message that describes the error. It identifies the specific input record that is not valid. The object (if any) that contains the not valid record is identified in either message APK108I or message APK109I.

The record number that is specified is relative to the user data stream and is different for multiple transmissions of the data set. However, the record number might be inaccurate if the data set is using a page definition that does conditional processing.

The sequence number might print as NOT AVAILABLE in the message. For example, a line-data record does not have a sequence number.

### System action

The disposition of the file depends upon the error that is described in the accompanying messages.

### System programmer response

See the specific error conditions that are described in the accompanying messages to determine an appropriate response.

### User response

See the specific error conditions that are described in the accompanying messages to determine an appropriate response.

**APK106I DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: NAME "*tokenname*" IN *begintypestructuredfield* DOES NOT MATCH NAME "*tokenname*" IN *endtypestructuredfield*.**

### Explanation

The TOKEN NAME parameters in the Begin-type and End-type structured fields identified in this message do not match. Structured fields might be out of sequence in the input data stream.

When token names are specified, the TOKEN NAME parameters in the associated Begin-type and End-type structured fields must match. For example, if the token name on a Begin Print File (BPF) structured field is specified, either the entire eight-character token name on an End Print File (EPF) structured field must match the BPF token or the first 2 bytes of the token name must be X'FFFF'.

### System action

Processing continues, and ACIF issues a message that identifies the position of the structured field in the input data stream or resource. ACIF issues additional messages that identify the processing environment when the error was found.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK108I THE ERROR REPORTED ABOVE WAS DETECTED WITHIN OBJECT TYPE *objecttype* WITH TOKEN NAME *tokenname*.**

### Explanation

This message is issued in addition to the message that describes the error. The objects that were being processed are listed to identify the location of the error in the input data stream or in a resource.

### System action

The disposition of the file depends on the error that is described in the accompanying messages.

### System programmer response

See the specific error conditions that are described in the accompanying messages to determine an appropriate response.

### User response

See the specific error conditions that are described in the accompanying messages to determine an appropriate response.

**APK109I THE ERROR REPORTED ABOVE WAS CAUSED BY THE RESOURCE *resourcename* IN AN EXTERNAL LIBRARY OR AN INLINE RESOURCE.**

### Explanation

This message is issued in addition to the message that describes the error. The object that is identified in the accompanying message was either a resource that is processed from an external library or an inline resource. Error message APK108I identifies the member as a page definition, form definition, font, code page, font character set, page segment, or an overlay. The combined information from these two messages can be used to identify the library that is defined to ACIF on the *type*LIB parameter, where *type* is the type of resource, such as OVLY for overlay. In the case of an inline form definition or page definition, the resource is not a member of an external library but is included at the beginning of the user's data set.

### System action

The disposition of the file depends on the error that is described in the accompanying messages.

### System programmer response

See the specific error conditions that are described in the accompanying messages to determine an appropriate response.

### User response

See the specific error conditions that are described in the accompanying messages to determine an appropriate response.

**APK110S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: THE LENGTH SPECIFIED IN THE SELF-DEFINING PARAMETER OR TRIPLET *identifier* OF THE *structuredfield* STRUCTURED FIELD IS INCORRECT.**

**Explanation**

Insufficient data was present in the structured field for the length that is given in the self-defining parameter or triplet. If the self-defining parameter or triplet ID is 0, the length of the self-defining parameter or triplet might be 0 or 1, which means that no ID was available for use in this message. This message can also be issued if a font resource is referenced by a Map Coded Font (MCF) structured field with a code page or character set name that is less than 8 bytes long. If your font resource names are shorter than 8 bytes, make sure that the references are padded with EBCDIC X'40' blanks.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the object with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the object, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the object, contact your system programmer.

**APK112S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: RECORD CONTAINS NO DATA, EVEN THOUGH AT LEAST A CONTROL CHARACTER IS EXPECTED.**

**Explanation**

ACIF read an input record without a control character that follows the record descriptor word (RDW). A minimum of 1 byte of control-character data is needed to make the record valid.

**System action**

ACIF stops processing the print data set.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK113S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: STRUCTURED FIELD LENGTH IS LESS THAN THE INTRODUCER LENGTH.**

**Explanation**

A structured field must have at least 8 bytes of data, the minimum length necessary for a structured-field introducer. The Extension Indicator flag in the structured-field introducer indicates whether the minimum length of the structured field can be greater than 8 bytes.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK114S** **DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: RECORD LENGTH DOES NOT AGREE WITH LENGTH IN STRUCTURED FIELD INTRODUCER.**

**Explanation**

All structured fields are preceded by a record length that specifies the entire length of the record, including 4 bytes in the record length and a 1-byte control character. However, the record length that is specified does not match the sum of the LENGTH parameter in the structured field introducer and the five other bytes.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, ensure that the record length that is specified is valid for the structured field , and resubmit the print request. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK116S** **DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: PADDING LENGTH OR EXTENSION LENGTH IS INCORRECT FOR STRUCTURED FIELD.**

**Explanation**

The length of padding or extension that is specified in the LENGTH or EXTENSION parameter in the structured-field introducer indicates more data than was found in the structured field.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, ensure that the Extension Indicator flag is set correctly and that the LENGTH parameter in the structured-field introducer specifies the actual length of padding for the structured field that is not valid. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured-field introducer. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK117S** **DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: LENGTH INDICATED IN THE STRUCTURED FIELD INTRODUCER IS INCORRECT FOR *structuredfield* STRUCTURED FIELD.**

**Explanation**

The length indicated by the structured-field introducer specifies an incorrect number of bytes for the structured field that is identified in this message. This error is caused by one of these:

- The Extension or Padding Indicator flags in the structured-field introducer are set incorrectly.
- One or more of the parameters in the structured field that is not valid contain too many bytes of data.

In some cases, the length of a structured field is specified in a parameter in another structured field. For example, the length of Fixed Data Text (FDX) structured field is specified in the SIZE parameter of the Fixed Data Size (FDS) structured field.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set or resource, ensure that the LENGTH parameter in the structured-field introducer specifies a valid length for the structured field. Also, ensure that the number of bytes in the structured-field parameter matches the length that is specified in the structured-field introducer. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured-field introducer.

If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK118W UNSUPPORTED STRUCTURED FIELD *code* WAS IGNORED, AND, IF IT BEGAN AN OBJECT, THE OBJECT WAS IGNORED.**

### Explanation

The IDENTIFIER parameter in the structured-field introducer for the incorrect structured field specified a structured-field code that was not recognized as a valid structured-field code.

### System action

If the structured field began an object, the object was ignored. Otherwise, only the structured field was ignored, and processing of the rest of the data set continues as usual.

ACIF issues a message that identifies the position of the structured field in the input data stream or containing resource. ACIF issues additional messages that identify the processing environment when the error was found.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If the printed output was unacceptable, and you created the structured fields for the print data set or resource, give the incorrect structured field a valid code for its structured-field type. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for a list of valid structured-field types.

If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured field for the print data set or resource, contact your system programmer.

**APK120S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: *structuredfield1* STRUCTURED FIELD CONTAINS AN INCORRECT VALUE FOR THE SIZE OF THE *structuredfield2* REPEATING GROUP.**

### Explanation

*Structuredfield1* specifies the length of each repeating group that is found in *structuredfield2*. Either the value that is specified in *structuredfield1* for the size of the repeating group is too small, or the actual length of the repeating-group data is not a multiple of the size specified.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

None.

### User response

Use the accompanying messages to determine whether the structured field that is causing the error is in the print data set or in a resource. Correct the process that is used to create the print data set or resource. If you used an IBM licensed program to create the data stream with the error, use local problem-reporting procedures to report this message.

**APK130S DATA IN AN INPUT RECORD IS INVALID: *structuredfield* STRUCTURED FIELD IS NOT ACCEPTABLE AT THE START OF A DATA STREAM.**

### Explanation

The structured-field type that is identified in this message is not valid at the start of the data stream. Subsequent error messages give additional information about the processing environment when the error occurred.

### System action

ACIF stops processing the print data set.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set, contact your system programmer.

**APK135I DATA IN A FORMDEF RESOURCE IS INVALID: DUPLICATE OVERLAY LOCAL IDENTIFIER WAS FOUND IN THE *structuredfield* STRUCTURED FIELD.**

### Explanation

The same local identifier was found assigned to more than one OVERLAY LOCAL IDENTIFIER parameter in the Map Medium Overlay (MMO) or Map Page Overlay (MPO) structured field repeating groups. The MMO structured field is contained in the form definition. The MPO is contained in the page definition or the print data set.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK138S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: OVERLAY LOCAL IDENTIFIER VALUE IS NOT ACCEPTABLE IN THE *structuredfield* STRUCTURED FIELD.**

### Explanation

An incorrect OVERLAY LOCAL IDENTIFIER was encountered in the Map Medium Overlay (MMO), Map Page Overlay (MPO), or Medium Modification Control (MMC) structured field repeating groups. The MMO and MMC structured fields are contained in the form definition. The MPO is contained in the page definition or the print data set.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK139S DATA IN A FORMDEF RESOURCE IS INVALID: SUPPRESSION LOCAL IDENTIFIER VALUE IS NOT ACCEPTABLE IN THE MSU STRUCTURED FIELD.**

**Explanation**

The SUPPRESSION LOCAL IDENTIFIER parameter in the Map Suppression (MSU) structured field is not valid. The MSU structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK140S DATA IN A FORMDEF RESOURCE IS INVALID: TWO MMC STRUCTURED FIELDS ARE DEFINED WITH THE SAME IDENTIFIER, *identifier*.**

**Explanation**

Two Medium Modification Control (MMC) structured fields in a single form environment group have the same value in their MEDIUM MODIFICATION CONTROL IDENTIFIER parameters. The MMC structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MMC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK141S DATA IN A FORMDEF RESOURCE IS INVALID: MEDIUM SUPPRESSION TOKEN NAME IS REPEATED IN MSU STRUCTURED FIELD.**

**Explanation**

The TOKEN NAME parameters in two repeating groups in a Map Suppression (MSU) structured field have the same value. The MSU structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference

for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK143S DATA IN A FORMDEF RESOURCE IS INVALID: COPY SPECIFICATIONS IN THE MCC STRUCTURED FIELD ARE NOT ACCEPTABLE.**

**Explanation**

Either a gap or an overlap exists in the Starting and Stopping Copy Numbers, or the maximum number of copies for one set of modifications is exceeded. The COPY NUMBER parameters are specified in the Medium Copy Count (MCC) structured field. The MCC structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, ensure that the Starting Copy Number and Stopping Copy Number parameters in a repeating group in an MCC structured field have valid values that correlate. Also, verify that fewer than 255 copies are requested. If 255 or more copies with the same modifications are needed, define two or more MCC structured fields. See *Mixed Object Document Content Architecture Reference* for more information on the MCC structured field. If the MCC has no errors, the error might be an ACIF logic error.

If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK145S DATA IN A FORMDEF RESOURCE IS INVALID: THE FORMS-FLASH VALUE IN MMC STRUCTURED FIELD, ID *identifier*, IS NOT ACCEPTABLE.**

**Explanation**

The Medium Modification Control (MMC) structured field contains an incorrect value for the repeating group that contains forms-flash modification. The MMC structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MMC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK146S DATA IN A FORMDEF RESOURCE IS INVALID: MORE THAN 8 OVERLAYS ARE SPECIFIED IN MMC STRUCTURED FIELD, ID *identifier*.**

**Explanation**

In a Medium Modification Control (MMC) structured field, the maximum number of overlays that are allowed in one set of modifications is exceeded. The MMC structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MMC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK147S DATA IN A FORMDEF RESOURCE IS INVALID: MORE THAN 8 SUPPRESSIONS ARE SPECIFIED IN MMC STRUCTURED FIELD, ID *identifier*.**

**Explanation**

In a Medium Modification Control (MMC) structured field, the maximum number of suppressions that are allowed in one set of modifications is exceeded. The MMC structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MMC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK152S DATA IN A FORMDEF RESOURCE IS INVALID: MMC STRUCTURED FIELD WAS NOT FOUND TO COMPARE WITH IDENTIFIER *identifier* IN MCC STRUCTURED FIELD.**

**Explanation**

The MEDIUM MODIFICATION CONTROL IDENTIFIER parameter in the Medium Copy Count (MCC) structured field contains a value that did not match the MEDIUM MODIFICATION CONTROL IDENTIFIER parameter in any Medium Modification Control (MMC) structured field in the Form Environment Group. The MCC and MMC structured fields are contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MCC or MMC structured field. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MCC and MMC have no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK154S DATA IN A FORMDEF RESOURCE IS INVALID: OVERLAY LOCAL IDENTIFIER IN MMC STRUCTURED FIELD, ID *identifier*, WAS NOT FOUND IN MMO STRUCTURED FIELD.**

**Explanation**

The overlay modification in the Medium Modification Control (MMC) structured field was not present in the Map Medium Overlay (MMO) structured field. The MMC and MMO structured fields are contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK155S DATA IN A FORMDEF RESOURCE IS INVALID: TOO MANY COPY CONTROLS WERE SPECIFIED FOR THE CURRENT FORM ENVIRONMENT GROUP.**

**Explanation**

For a given physical page, up to 256 bytes of data can be specified for the printer command that describes the copies and modifications to be made. The current Form Environment Group causes the data for the command to exceed 256 bytes. ACIF builds the printer command from data that is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, either reduce the number of copy groups in the Medium Copy Count (MCC) structured field or reduce the number of modifications that are specified in the Medium Modification Control (MMC) structured field. Otherwise, split these functions between two or more form environment groups in two or more medium maps. Then, include in your input two or more identical copies of the same page that each select an appropriate copy group by use of the Invoke Medium Map (IMM) structured field. See *Mixed Object Document Content Architecture Reference* for more information about the MMC and MMO structured fields.

If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK156S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: NULL NAME IS NOT ACCEPTABLE IN *structuredfield* STRUCTURED FIELD.**

**Explanation**

All Begin-type and End-type structured fields can include an 8-byte token name. A null token name is not allowed for the listed structured field.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK157S MISMATCH BETWEEN PRINT DATA SET AND FORMDEF RESOURCE: MEDIUM MAP "*mediummap*" SPECIFIED IN IMM STRUCTURED FIELD WAS NOT FOUND IN FORMDEF "*formdefinition*".**

**Explanation**

The TOKEN NAME parameter in the Invoke Medium Map (IMM) structured field specifies the token name that is used to locate a medium map in the form definition. This parameter must match the TOKEN NAME parameter specified in bytes 0–7 in one of the Begin Medium Map (BMM) structured fields in the current form definition. The IMM structured field is contained in the print data set.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

No response is necessary.

**User response**

Ensure that the correct form definition was specified. If it was, and if you added the Invoke Medium Map structured field to the print data set, change the TOKEN NAME in the IMM structured field and run ACIF. See *Mixed Object Document Content Architecture Reference* for more information about the BMM and IMM structured fields. If the correct form definition was specified, and if you used a program to embed the IMM structured field in the print data set, verify that the copy group name that you gave the program is valid for the form definition you specified.

**APK158I PAGEDEF PARAMETER MUST BE SPECIFIED IN ORDER TO PRINT THIS DATA SET. DETERMINE THE PERMISSIBLE VALUES USED IN YOUR INSTALLATION FOR THE PAGEDEF PARAMETER.**

**Explanation**

The current data set contains line data, XML data, or structured fields that do not form a MO:DCA-P page. This kind of data set cannot be printed without an active page definition. No PAGEDEF keyword was provided for this job.

This error can also occur if MO:DCA-P data in the print data set contains a record without the required X'5A' control character that precedes the structured-field introducer. The missing control character makes the record appear to be line data. A page definition is necessary to process line data. Therefore, ACIF detects an error.

**System action**

ACIF stops processing the print data set.

**System programmer response**

No response is necessary.

**User response**

If you intended to print line data or XML data, you must specify the PAGEDEF keyword when you start ACIF.

If you did not intend to print line data or XML data, and you used a program to create the structured fields for the print data set, ensure that all MO:DCA-P data records begin with the X'5A' control character and then contact your system programmer.

**APK159S THE END OF THE DATA STREAM WAS ENCOUNTERED BEFORE THE LOGICAL END OF AN OBJECT WITHIN THE DATA STREAM.**

**Explanation**

ACIF was processing an object that began with a Begin-type structured field. However, the input data stream ended before a corresponding End-type structured field was found. For example, if a Begin Print File (BPF) structured field is found, an End Print File (EPF) structured field must follow it. The message can also occur if the system operator prematurely interrupts or ends a print request by issuing an INTERRUPT, RESTART, or CANCEL Job Entry Subsystem (JES) command.

**System action**

ACIF stops processing the print data set.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis

reference for assistance in determining the source of the problem.

#### User response

If you created the structured fields for the print data set, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set, contact your system programmer.

### APK162S MISMATCH BETWEEN PRINT DATA SET AND PAGEDEF RESOURCE: DATA MAP "*datamap*" SPECIFIED IN IDM STRUCTURED FIELD WAS NOT FOUND IN PAGEDEF "*pagedefinition*".

#### Explanation

The TOKEN NAME parameter in the Invoke Data Map (IDM) structured field specifies the token name that is used to locate a data map in the page definition. The name must match the value that is specified in the TOKEN NAME parameter in the Begin Data Map (BDM) structured field in the current page definition. The IDM structured field is contained in the print data set.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

No response is necessary.

#### User response

Ensure that the correct page definition was specified. If it was, and if you added the Invoke Data Map structured field to the print data set, change the TOKEN NAME in the IDM structured field and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the BDM and IDM structured fields. If the correct page definition was specified, and if you used a program to embed the IDM structured field in the print data set, verify that the data map name that you supplied the program is one that is valid for the page definition you specified.

### APK163I DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: THE SCALE FACTOR VALUE IN THE IOC STRUCTURED FIELD IS NOT ACCEPTABLE.

#### Explanation

The IMAGE BLOCK SCALE FACTOR parameter in the Image Output Control (IOC) structured field is not valid. The image block or image cell might be contained in an overlay, a page segment, or a composed-text print data set. It might also be embedded in a data set containing line data by using a Begin Image (BIM) structured field.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

If you created the structured fields for the resource or print data set containing the image, correct the error in the referenced structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the resource or print data set containing the image, contact your system programmer.

### APK166S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: AN ENTRY IN A MCF STRUCTURED FIELD CONTAINS AMBIGUOUS IDENTIFICATION.

#### Explanation

A font in the Map Coded Font (MCF) structured field can be identified with a CODED FONT NAME parameter, with a combination of the FONT CHARACTER SET NAME parameter and the CODE PAGE NAME parameter, or with a CODED FONT parameter (also known as a GRID parameter). One of the repeating groups in an MCF structured field specified more than one of these ways to specify a font or specified a CODED FONT (GRID) and a section number other than 0. The MCF structured field is in the MO:DCA-P data, an overlay, or a page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK167S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: AN ENTRY IN AN MCF STRUCTURED FIELD CONTAINS INCOMPLETE IDENTIFICATION.**

**Explanation**

One of the repeating groups in a Map Coded Font (MCF) structured field does not contain enough information to identify a coded font. Two ways to identify a font in the Map Coded Font (MCF) structured field are either with a CODED FONT NAME parameter or with a combination of the FONT CHARACTER SET NAME parameter and the CODE PAGE NAME parameter. An entry contains only a FONT CHARACTER SET NAME parameter or a CODE PAGE NAME parameter. The MCF structured field is contained in a composed-text print data set, an overlay, or a page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK169S INSUFFICIENT VIRTUAL STORAGE PREVENTED FURTHER PROCESSING. INCREASE REGION SIZE, AND RESUBMIT THE PRINT REQUEST.**

**Explanation**

Insufficient storage is available in the ACIF address space to contain the internal control block that is needed to read an object.

**System action**

ACIF stops processing the print data set.

**System programmer response**

The value of the REGION parameter that is used for the ACIF job must be increased.

**User response**

Inform your system programmer that this error occurred.

**APK170S DATA IN A FORMDEF RESOURCE IS INVALID: THE SIMPLEX/ DUPLEX VALUE IN MMC STRUCTURED FIELD, ID *identifier*, IS NOT ACCEPTABLE.**

**Explanation**

In the Medium Modification Control (MMC) structured field with the specified identifier, either the simplex or the duplex keyword-parameter value is not valid. The

MMC structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MMC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK171S** **DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: FONT LOCAL IDENTIFIER VALUE IS NOT ACCEPTABLE IN THE *structuredfield* STRUCTURED FIELD.**

**Explanation**

The Map Coded Font (MCF) structured field consists of repeating groups. In one of the groups, the value of the CODED FONT LOCAL IDENTIFIER parameter for the font (section) being mapped is not valid. The MCF structured field is contained in a composed-text print data set, an overlay, or a page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK172S** **DATA IN A FORMDEF RESOURCE IS INVALID: THE SET OF MODIFICATIONS SPECIFIED IN THE MCC STRUCTURED FIELD INCLUDES BOTH NORMAL AND TUMBLE DUPLEX.**

**Explanation**

The Medium Copy Count (MCC) structured field refers to one or more Medium Modification Control (MMC) structured fields , which include requests for both normal duplex and tumble duplex. You cannot request both normal duplex and tumble duplex within the same medium map. The MCC and MMC structured fields are contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MCC or MMC structured field. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MCC and MMC have no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK178S** **DATA IN A FORMDEF RESOURCE IS INVALID: THE MCC STRUCTURED FIELD HAS AN ODD**

**NUMBER OF COPY GROUPS, BUT SPECIFIES DUPLEX.**

**Explanation**

The Medium Copy Count (MCC) structured field specifies an odd number of copy groups, but the copy group modifications that are specified in the Medium Modification Control (MMC) structured field include duplex, which requires an even number of copy groups. The MCC and MMC structured fields are contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MCC or MMC structured field. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MCC and MMC have no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK179S** **DATA IN A FORMDEF RESOURCE IS INVALID: THE SET OF MODIFICATIONS SPECIFIED IN THE MCC STRUCTURED FIELD INCLUDES BOTH SIMPLEX AND DUPLEX.**

**Explanation**

The Medium Copy Count (MCC) structured field refers to two or more Medium Modification Control (MMC) structured fields, which include requests for both simplex and duplex printing. You cannot specify both simplex and duplex printing within the same medium map. The MCC and MMC structured fields are contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MCC or MMC structured field. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MCC and MMC have no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK181S** **DATA IN A FORMDEF RESOURCE IS INVALID: UNEQUAL COPY COUNTS FOR DUPLEX SHEETS ARE SPECIFIED IN THE MCC STRUCTURED FIELD.**

**Explanation**

The set of modifications that are referred to by the Medium Copy Count (MCC) structured field includes duplexing, but the numbers of copies in two corresponding repeating groups are not equal. The repeating groups are defined in the Medium Map Control structured field (MMC). The MCC and MMC structured fields are contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the MCC or MMC structured field. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MCC and MMC have no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

## APK190S DATA IN A FORMDEF RESOURCE IS INVALID: THE BIN-SELECTION VALUE IN MMC STRUCTURED FIELD, ID *identifier*, IS NOT ACCEPTABLE.

### Explanation

In the Medium Modification Control (MMC) structured field with the identifier that is specified in the message text, the bin-selection parameter value was not valid. The MMC structured field is contained in the form definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MMC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

## APK191S DATA IN A FORMDEF RESOURCE IS INVALID: THE SUPPRESSION LOCAL IDENTIFIER VALUE IN MMC STRUCTURED FIELD, ID *identifier*, IS NOT ACCEPTABLE.

### Explanation

The MEDIUM MODIFICATION CONTROL IDENTIFIER parameter in a Medium Modification Control (MMC) structured field is not valid. The MMC structured field is contained in the form definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MMC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

## APK210S DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A REQUIRED TRIPLET OR SELF-DEFINING PARAMETER WITH ID *identifier* WAS MISSING FROM A *structuredfield* STRUCTURED FIELD.

### Explanation

The triplet or self-defining parameter that is specified in the message was not found in the structured field indicated. This is a required triplet or self-defining parameter.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured field with the error, verify that the input to that program is valid.

**User response**

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields, contact your system programmer.

**APK212S DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE UNIT BASE PARAMETER IN THE *structuredfield* STRUCTURED FIELD IS NOT VALID.**

**Explanation**

An incorrect Unit Base value was encountered in the structured field that is identified in this message.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

None.

**User response**

Correct the process that is used to create the image object. If you used an IBM licensed program to create the image object with the error, use local problem-reporting procedures to report this message.

**APK217S DATA IN AN INPUT RECORD IS INVALID: PARAMETER IN A BR STRUCTURED FIELD CONTAINS UNACCEPTABLE DATA.**

**Explanation**

One of the parameters in the Begin Resource (BRS or BR) structured field is not valid. The BRS structured field is contained in the print data set.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to place the BRS structured field in the print data set, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you placed the BRS structured field in the print data set, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If you used a program to place the BRS structured field in the print data set, contact your system programmer.

**APK221S DATA IN A FORMDEF RESOURCE IS INVALID: THE ORIENTATION VALUE *value* IN THE MDD STRUCTURED FIELD IS UNACCEPTABLE.**

**Explanation**

The Medium Descriptor (MDD) structured field has an incorrect orientation value. The MDD structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK223I A FORMDEF RESOURCE REQUIRED ENHANCED N_UP AND A CONFLICTING VALUE FOR THE DUPLEX PARAMETER WAS SPECIFIED.**

**Explanation**

When enhanced N_UP is requested, the DUPLEX parameter cannot be used to change from duplex (specified in the form definition) to simplex or vice versa. The reason is that with enhanced N_UP, the Page Position (PGP) Format 2 structured field specified the partition number and sheet side for each page placed on a sheet. If the duplex value is changed from duplex to simplex or vice versa, ACIF does not have the information that it needs to place the pages.

The only valid options for the DUPLEX parameter when enhanced N_UP is specified in the form definition are:

- If the form definition requests normal or tumble duplex, you can specify either NORMAL or TUMBLE on the DUPLEX parameter.
- If the form definition requests simplex, you can specify NO on the DUPLEX parameter.

**System action**

ACIF stops processing the input file and issues a message that identifies the position of the structured field in the file or resource.

**System programmer response**

No response is necessary.

**User response**

Resubmit the job without specifying the DUPLEX parameter.

**APK244I** **DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE *structuredfield* STRUCTURED FIELD CONTAINS TOO MANY REPEATING GROUPS.**

**Explanation**

The structured field contains more repeating groups than are allowed. The structured field in which the error appears can be in a Resource Environment Group, a composed text page, an overlay, or a page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK245I** **A COMPLEX IM IMAGE OBJECT CONTAINS INVALID OR INCORRECT DATA. THE COMPLEX IM IMAGE OBJECT CANNOT BE CONVERTED TO AN IO IMAGE OBJECT.**

**Explanation**

This message is issued when ACIF converts a complex IM image object to an IO image object and the image size is not large enough to contain the image raster data from the IRD structured fields. This message is issued when the default IMAGEOUT=IOCA parameter is specified. This message is issued if either of these are true:

- The XCSize or YCSize parameter value of the ICP structured field is larger than the calculated image X size or Y size.
- The XCOset plus XFilSize parameter values or the YCOset plus YFilSize parameter values of the ICP structured field are larger than the calculated image X size or Y size.

When ACIF converts a complex IM image object to an IO image object, ACIF calculates the image size by subtracting the X and Y image origins from the X and Y page sizes. The X and Y image origins are from the Xoa0set and Yoa0set parameter values of the IOC structured field. The X and Y page sizes are from the XpgSize and YpgSize parameter values of the PGD structured field, if the image object is contained in a MO:DCA-P file or overlay, or is embedded in a file that contains line data. For an image object in a page segment, the page sizes that are used by ACIF are 2040 for X and 2640 for Y. The IOC and ICP structured fields are contained in a MO:DCA-P file, overlay, or page segment, or are embedded in a file that contains line data. The PGD structured field is contained in a MO:DCA-P file, overlay, or page definition.

**System action**

ACIF stops.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

Specify EXTENSIONS=CELLED and IMAGEOUT=ASIS to see whether the error is corrected. Otherwise, if you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK250S** **DATA IN A PAGE OR RESOURCE IS MISSING: THE REQUIRED STRUCTURED FIELD *structuredfield* COULD NOT BE FOUND TO COMPLETE THE PROCESSING OF A PAGE OR RESOURCE.**

**Explanation**

The structured field identified in this message is required to complete the processing of a page or resource. This structured field was not found before the end of the page or resource was encountered.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK251S** **DATA IN A FORMDEF RESOURCE IS MISSING: THE FORMDEF DOES NOT CONTAIN ANY MEDIUM MAPS.**

**Explanation**

The form definition did not specify any medium maps; however, a medium map is required to print a page.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK253S** **DATA IN A FORMDEF RESOURCE IS INVALID: THE PRINT QUALITY VALUE IN MMC STRUCTURED FIELD, ID *identifier*, IS NOT ACCEPTABLE.**

**Explanation**

The Medium Modification Control (MMC) structured field specified a print quality value of 0, which is outside the valid range. The MMC structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MMC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK254S DATA IN A FORMDEF RESOURCE IS INVALID: THE OFFSET STACKING VALUE IN MMC STRUCTURED FIELD, ID *identifier*, IS NOT ACCEPTABLE.**

**Explanation**

The Medium Modification Control (MMC) structured field specified an offset stacking value other than 0 or 1. The MMC structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MMC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK258I DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: *structuredfield* STRUCTURED FIELD IS NOT ALLOWED BETWEEN OBJECTS.**

**Explanation**

The structured field identified in this message is not allowed at the point in the input data stream or resource at which it was found.

**Note:** If the structured field is “EOF”, ACIF read the entire print data set without finding an expected structured field.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured fields are in the correct order, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK259I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE X-DIRECTION AND Y-DIRECTION L-UNITS PER UNIT BASE VALUES SPECIFIED IN THE *structuredfield***

**STRUCTURED FIELD DO NOT MATCH.**

**Explanation**

The X-direction and Y-direction L-Units per Unit Base values in the structured field identified in the message are not identical.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

None.

**User response**

Use the accompanying messages to determine whether the structured field causing the error is in the print data set or in a resource. Correct the process that is used to create the print data set or resource. If you used an IBM licensed program to create the data stream with the error, use local problem-reporting procedures to report this message.

**APK261S** **DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: STRUCTURED FIELD *structuredfield* CONTAINED A FONT LOCAL IDENTIFIER VALUE THAT WAS USED IN A PREVIOUS FONT MAPPING STRUCTURED FIELD.**

**Explanation**

One or more font mapping structured fields in the same Active Environment Group or Object Environment Group used the same font local identifier for different fonts. Fonts can be mapped in a Map Coded Font (MCF) and a Map Data Resource (MDR) structured field. Each font that is mapped must have a unique font local identifier. The MCF and MDR structured fields can be in the MO:DCA print data set, an overlay, a graphics object, a bar code object, or a page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

None.

**User response**

If you created the structured fields in the object that is containing the error, check the font local identifiers in the MCF and MDR structured field for duplicates. If the MCF and MDR structured fields have no error, the error might be an ACIF logic error. If you used a program to create the structured fields in the object that is containing the error, contact your system programmer.

**APK262S** **DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: STRUCTURED FIELD *structuredfield* CONTAINS AN INVALID ROTATION VALUE.**

**Explanation**

The rotation value that is specified in the named structured field was not valid.

**System action**

ACIF stops processing the print data set. ACIF issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK263S** **OVERLAY *overlayname* NAMED IN AN IPO STRUCTURED FIELD IS NOT NAMED IN AN MPO STRUCTURED FIELD.**

**Explanation**

An Include Page Overlay (IPO) structured field names a page overlay, but the overlay was not previously defined in the Map Page Overlay (MPO) structured field in the Active Environment Group (AEG) of the page, which contains the IPO. The MPO might be contained in the AEG of a composed-text page or a page definition.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

If the MPO indicates that this overlay is for annotation only, create another MPO structured field in the AEG that defines the page overlay. If you are using the input data to define the name of your page overlay and your input data is ASCII, this error can occur because the resource name in the MPO is EBCDIC. If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you use a program to create the structured fields for the print data set or the resource, contact your system programmer.

### APK264S DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A RESOURCE MAPPED BY A *structuredfield* STRUCTURED FIELD IN AN OBJECT ENVIRONMENT GROUP IS NOT NAMED IN THE ACTIVE ENVIRONMENT GROUP OF THE PAGE OR RESOURCE.

#### Explanation

A structured field in an Object Environment Group names a resource. However, that resource is not defined in the structured field in the Active Environment Group of the page or resource that contains the Object Environment Group.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

Make sure that any resources that are mapped in an included object are also mapped in the Page Environment Group. If an MCF structured field is inside the object, it also needs to be in the Page Environment Group with the identical characteristics it has in the object, such as point size for an outline font. If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

### APK267S EITHER NO ENVIRONMENT GROUP WAS SPECIFIED FOR THE PAGE OR AN ERROR OCCURRED IN THE ENVIRONMENT GROUP.

#### Explanation

Either no environment group was specified, or an error occurred in one of the structured fields in the environment group. If an environment group was present but contained an error, a previous ACIF message identifies the error. The environment group that causes this error might be contained in an overlay, a page definition, or a composed-text print data set.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK268S WARNING: AN ENTRY IN AN MCF STRUCTURED FIELD DOES NOT CONTAIN CODE PAGE INFORMATION.**

**Explanation**

One of the repeating groups in a Map Coded Font Format 2 (MCF-2) structured field specifies a font character set but no code page information. This error was detected while ACIF was processing a graphics object within a page or overlay.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the object with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the object, correct the error and resubmit the print request. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the object, contact your system programmer.

**APK269S A VALUE OF ZERO WAS SPECIFIED AS THE L-UNITS PER UNIT BASE IN THE *structuredfield* STRUCTURED FIELD.**

**Explanation**

Several structured fields specify an L-Units per Unit Base value: Medium Descriptor (MDD), Page Descriptor (PGD), Presentation Text Descriptor (PTD-2), Object Area Descriptor (OBD), Graphics Data Descriptor (GDD), Image Data Descriptor (IDD), Barcode Data Descriptor (BDD), Image Input Descriptor (IID), Include Object (IOB), and Preprocess Presentation Object (PPO). The ACIF arithmetic equation and a value of zero can result in an abend (divide by zero error). The value of zero is not valid.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

None.

**User response**

Use the accompanying messages to determine whether the structured field causing the error is in the print data set or in a resource. Correct the process that is used to create the print data set or resource. If you used an IBM licensed program to create the data stream with the error, use local problem-reporting procedures to report this message.

**APK270S DATA IN A PAGEDEF RESOURCE IS MISSING: THE PAGEDEF DOES NOT CONTAIN ANY DATA MAPS.**

**Explanation**

The page definition did not specify any data maps and a data map is required to print a data set containing line data.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an

ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK271S DATA IN A FORMDEF RESOURCE IS INVALID: THE DUPLEX SPECIFICATION IN THE PGP STRUCTURED FIELD IS NOT ACCEPTABLE.**

### Explanation

The duplex specification value in the Page Position (PGP) structured field is not acceptable. The PGP structured field is contained in the form definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK272S DATA IN A FORMDEF RESOURCE IS INVALID: THE PGP STRUCTURED FIELD DOES NOT CONTAIN A PAGE ORIGIN POSITION FOR THE FRONT SIDE OF A SHEET.**

### Explanation

The Page Position format-2 (PGP) structured field must contain a repeating group that defines the Page Origin Position for the front side. This value is also used for the back side of a duplex sheet unless the PGP structured field contains a repeating group that specifies the Page Origin Position for the back side of the sheet. The PGP structured field is contained in the form definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK273S DATA IN A FORMDEF RESOURCE IS INVALID: THE CONSTANT FORMS CONTROL VALUE IN THE MMC STRUCTURED FIELD ID *identifier* IS NOT ACCEPTABLE.**

### Explanation

The Constant Forms Control modification in the Medium Modification Control (MMC) structured field contained an unsupported value. The MMC structured field is contained in the form definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK274S DATA IN A FORMDEF RESOURCE IS INVALID: THE MODIFICATIONS SPECIFIED IN THE MCC STRUCTURED FIELD INCLUDE CONFLICTING CONSTANT FORMS CONTROL VALUES FOR THE SAME SIDE OF THE SHEET.**

### Explanation

All Medium Modification Control (MMC) structured fields referenced by the Medium Copy Count (MCC) structured field must use the same Constant Forms Control value for the same side of a sheet. The MMC and MCC structured fields are contained in the form definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK275S DATA IN A FORMDEF RESOURCE IS INVALID: A MEDIUM MAP SPECIFIES ONLY CONSTANT DATA FOR A PAGE.**

### Explanation

An attempt was made to process a page that uses a medium map that specifies Constant Forms Control for both the front and back sides of a duplexed page or for the front side of a simplexed page. Another medium map must be invoked to allow processing of the remaining line or page data. The Constant Forms Control is contained in a Medium Modification Control (MMC) structured field. The MMC structured field is contained in the form definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK278S DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE MAPPING OPTION SPECIFIED IN THE *structuredfield* STRUCTURED FIELD IS INCORRECT OR UNSUPPORTED.**

### Explanation

The structured field in error contained an incorrect Mapping Option value. The structured field might be contained in a bar code object, graphics object, image object, presentation text object with OEG, or object container object. Alternatively, it might be an Include Object (IOB) structured field or a Preprocess Presentation Object (PPO) structured field with an incorrect mapping option triplet.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

Correct the process that is used to create the object. If you used an IBM licensed program to create the object with the error, use the local problem-reporting procedures to report this message.

**APK289I** **DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE FONT SCALING SIZE VALUE SPECIFIED IN AN MCF STRUCTURED FIELD IS NOT ACCEPTABLE.**

**Explanation**

The value that is specified for either the font vertical scale factor, the horizontal scale factor, or the font width is not within the acceptable range of 0 - 32767.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK290I** **THE REGISTERED OBJECT TYPE ID OF AN OBJECT CONTAINER RESOURCE, NAMED *name* DOES NOT MATCH THE OBJECT CLASS *objectclass* IN THE OBJECT CLASSIFICATION TRIPLET ON A *structuredfield* STRUCTURED FIELD.**

**Explanation**

The registered object type OID does not match the object class that is specified on the X'10' Object Classification triplet that is on the identified structured field. Object containers and their registered object type identifiers are only supported by certain object classes. For more information about the structured field and triplet, see *Mixed Object Document Content Architecture Reference*.

**System action**

The resource is skipped and processing of the data set continues.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured field, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If you used a program to create the structured field, contact your system programmer.

**APK291I** **THE METADATA OBJECT NAMED *name* IS OUT OF SEQUENCE IN THE DATA SET. THE METADATA OBJECT IS IGNORED.**

**Explanation**

A metadata object is found out of sequence in the AFP data stream and is therefore ignored. Because metadata objects are not sent to the printer, the printed output is not affected. However, the skipped resource is not sent to the document that ACIF generates.

**System action**

The resource is skipped and processing of the data set continues.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis

reference for assistance in determining the source of the problem.

**User response**

If you created the structured field, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If you used a program to create the structured field, contact your system programmer.

**APK299I AN IM IMAGE OBJECT CONTAINS INVALID OR INCORRECT DATA. THE IM IMAGE OBJECT CANNOT BE CONVERTED TO AN IO IMAGE OBJECT.**

**Explanation**

This message is issued when ACIF converts an IM image object to an IO image object and one of the image size values is zero. For a simple IM image object, this message is issued if either the XSize or YSize parameter value of the Image Input Descriptor (IID) structured field is zero. For a complex IM image object, this message is issued if one of the XCSize, YCSize, XFilSize, or YFilSize parameter values of the Image Cell Position (ICP) structured field is zero.

When ACIF processes a page segment in an inline resource group, the resource is converted from an IM1 image to an IOCA image unless the IMAGEOUT=ASIS parameter is specified. This message is issued if the application later includes the page segment in a page or overlay with a nonzero orientation or with L-units other than 1440 per inch.

**System action**

ACIF stops processing the print data set.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

Correct the error and resubmit the request. You might need to do one of these to correct the error:

- Specify IMAGEOUT=ASIS to avoid the IM1 conversion.
- Specify EXTENSIONS=RESORDER so the image is not converted until it is used in the document.
- Do not put the page segments inline.

**APK300I DATA IN A PAGEDEF RESOURCE IS INVALID: THE NEXT LINE DESCRIPTOR IF SKIPPING PARAMETER VALUE IN LND STRUCTURED FIELD NUMBER *number* IS 0.**

**Explanation**

The current record contains a control character that indicates a skip to a Line Descriptor (LND) structured field with a specific channel control. However, the LND structured field identified in this message had a value of 0 in its NEXT LINE DESCRIPTOR IF SKIPPING parameter. The LND structured field is contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK301S DATA IN A PAGEDEF RESOURCE IS INVALID: THE NEXT LINE DESCRIPTOR IF SKIPPING PARAMETER VALUE IN LND STRUCTURED FIELD NUMBER *number* IS *parametervalue*. THIS EXCEEDS THE LNC STRUCTURED FIELD COUNT VALUE OF *parametervalue*.**

**Explanation**

In the Line Descriptor (LND) structured field identified in this message, the value of the next LND IF

SKIPPING parameter is greater than the total number of LND structured fields in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK307S DATA IN A PAGEDEF RESOURCE IS INVALID: IN LND STRUCTURED FIELD NUMBER *number*, THE REUSE RECORD FLAG WAS SET BUT THE NEXT LINE DESCRIPTOR IF REUSING DATA PARAMETER WAS 0.**

### Explanation

In the Line Descriptor (LND) structured field identified in this message, the Reuse Record flag has a value of B'1', indicating that the data that is processed in this LND structured field is reused and processed. The NEXT LINE DESCRIPTOR IF REUSING DATA parameter must point to the LND structured field used to continue processing. However, the value for the REUSING DATA parameter was X'0000', indicating the end of the chain. The LND structured field is contained in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK309S DATA IN A PAGEDEF RESOURCE IS INVALID: THE REPEATING GROUP LENGTH PARAMETER VALUE IN CCP STRUCTURED FIELD *ccpidentifier* IS INVALID.**

### Explanation

The Conditional Processing Control (CCP) structured field has an incorrect value. Either the LENGTH OF REPEATING GROUPS parameter is zero, or the length of the repeating group data is not a multiple of the size that is specified in that parameter. The CCP structured field is contained in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK310S DATA IN A PAGEDEF RESOURCE IS INVALID: THE COUNT PARAMETER VALUE IN THE LNC STRUCTURED FIELD WAS 0.**

**Explanation**

The COUNT parameter in the Line Descriptor Count (LNC) structured field had a value of zero. The LNC structured field is contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK312S DATA IN A PAGEDEF RESOURCE IS INVALID: THE SIZE PARAMETER VALUE IN THE FDS STRUCTURED FIELD WAS 0.**

**Explanation**

The SIZE parameter in the Fixed Data Size (FDS) structured field has a value of 0. The FDS structured field is contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK314S DATA IN A PAGEDEF RESOURCE IS INVALID: THE NUMBER OF REPEATING GROUPS PARAMETER VALUE IN CCP STRUCTURED FIELD *ccpidentifier* IS INVALID.**

**Explanation**

The Conditional Processing Control (CCP) structured field has an incorrect value. Either the NUMBER OF REPEATING GROUPS parameter that is contained in the CCP structured field is zero, or the number of repeating groups does not match the number that is specified in the parameter. The CCP structured field is contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an

ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK315S DATA IN A PAGEDEF RESOURCE IS INVALID: THE NEXT LINE DESCRIPTOR IF SPACING PARAMETER VALUE IN LND STRUCTURED FIELD NUMBER *number* IS 0.**

#### Explanation

The logical-record control character indicates that the NEXT LINE DESCRIPTOR IF SPACING parameter must be followed. However, in the Line Descriptor (LND) structured field identified in this message, the NEXT LINE DESCRIPTOR IF SPACING parameter value was zero. The LND structured field is contained in the page definition.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK316S DATA IN A PAGEDEF RESOURCE IS INVALID: THE NEXT LINE DESCRIPTOR IF SPACING PARAMETER IN LND STRUCTURED FIELD NUMBER *number* IS *parametervalue*. THIS VALUE IS TOO LARGE.**

#### Explanation

The logical record control character indicates that the NEXT LINE DESCRIPTOR IF SPACING parameter in the Line Descriptor (LND) structured field must be followed. However, in the Line Descriptor (LND) structured field identified in this message, the NEXT LINE DESCRIPTOR IF SPACING parameter value was greater than the total number of line descriptors in the data map. The LND structured field is contained in the page definition.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK317S DATA IN A PAGEDEF RESOURCE IS INVALID: THE LENGTH OF COMPARISON STRING PARAMETER VALUE IN CCP STRUCTURED FIELD *ccpidentifier* IS INVALID.**

#### Explanation

The Conditional Processing Control (CCP) structured field has an incorrect value. Either the LENGTH OF COMPARISON STRING parameter is zero, or the length of the comparison string data does not match the length of a repeating group minus the fixed lengths of the remaining fields of the repeating group. The CCP structured field is contained in the page definition.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK319I** **DATA IN A PAGEDEF RESOURCE IS NOT VALID: LND, RCD, OR XMD STRUCTURED FIELD NUMBER *number* HAS A NULL VALUE SPECIFIED IN THE SUPPRESSION TOKEN NAME PARAMETER. A NULL VALUE IS NOT VALID.**

**Explanation**

The SUPPRESSION TOKEN NAME parameter in the Line Descriptor (LND), Record Descriptor (RCD), or XML Descriptor (XMD) structured field in the page definition has a null value. A null value is any value that contains X'FFFF' in the first 2 bytes.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK320S** **DATA IN A PAGEDEF RESOURCE IS INVALID: THE IDENTIFIER *identifier1* SPECIFIED IN THE NEXT CCP IDENTIFIER PARAMETER IN CCP STRUCTURED FIELD *identifier2* WAS NOT FOUND.**

**Explanation**

The Conditional Processing Control (CCP) structured field has an incorrect value. The NEXT CONDITIONAL PROCESSING CONTROL IDENTIFIER parameter in the CCP structured field specifies the identifier that is used to locate a CCP, if the CCP structured fields are chained. The identifier must match a value that is specified in the CCP IDENTIFIER parameter of another CCP within the same page definition. The identifier that is specified in the NEXT CCP IDENTIFIER parameter did not match the CCP IDENTIFIER of any CCPs in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK321S** **DATA IN A PAGEDEF RESOURCE IS INVALID: THE TIMING OF ACTION PARAMETER VALUE *value* IN CCP STRUCTURED FIELD *ccpidentifier* IS INVALID.**

### Explanation

The Conditional Processing Control (CCP) structured field has an incorrect value. The TIMING OF ACTION parameter in one of the repeating groups of the CCP structured field contains an incorrect value. The CCP structured field is contained in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK322S** **DATA IN A PAGEDEF RESOURCE IS INVALID: THE MEDIUM MAP ACTION PARAMETER VALUE *value* IN CCP STRUCTURED FIELD *ccpidentifier* IS INVALID.**

### Explanation

The Conditional Processing Control (CCP) structured field has an incorrect value. The MEDIUM MAP ACTION parameter in one of the repeating groups of the CCP structured field contains an incorrect value. The CCP structured field is contained in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK323S** **DATA IN A PAGEDEF RESOURCE IS INVALID: THE DATA MAP ACTION PARAMETER VALUE *value* IN CCP STRUCTURED FIELD *ccpidentifier* IS INVALID.**

### Explanation

The Conditional Processing Control (CCP) structured field has an incorrect value. The DATA MAP ACTION parameter in one of the repeating groups of the CCP structured field contains an incorrect value. The CCP structured field is contained in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK324S** **DATA IN A PAGEDEF RESOURCE IS INVALID: THE COMPARISON PARAMETER VALUE *value* IN CCP**

**STRUCTURED FIELD *ccpidentifier* IS INVALID.**

**Explanation**

The Conditional Processing Control (CCP) structured field has an incorrect value. The COMPARISON parameter in one of the repeating groups of the CCP structured field contains an incorrect value. The CCP structured field is contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK326S DATA IN A PAGEDEF RESOURCE IS INVALID: THE DATA MAP "*datamapname*" SPECIFIED IN THE DATA MAP NAME PARAMETER OF CCP STRUCTURED FIELD *ccpidentifier* WAS NOT FOUND.**

**Explanation**

The Conditional Processing Control (CCP) structured field has an incorrect value. The DATA MAP NAME parameter in one of the repeating groups of the CCP structured field specifies the token name of a data map that is used to locate a data map in the page definition. The name must match the value that is specified in the TOKEN NAME parameter in one of the Begin Data Map (BDM) structured fields in the current page definition. No data map with name *datamapname* was found in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK327S DATA IN A PAGEDEF RESOURCE IS INVALID: THE NEXT LINE DESCRIPTOR IF REUSING DATA PARAMETER VALUE IN LND STRUCTURED FIELD NUMBER *number* WILL CAUSE AN INFINITE LOOP.**

**Explanation**

The NEXT LINE DESCRIPTOR IF REUSING DATA parameter in the Line Descriptor (LND) structured field identified in this message caused an infinite-loop condition. The LND structured field is contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK329S DATA IN A PAGEDEF RESOURCE IS INVALID: THE NEXT LINE DESCRIPTOR IF REUSING DATA PARAMETER VALUE IN LND STRUCTURED FIELD NUMBER *number* IS *parametervalue1*. THIS EXCEEDS THE LNC STRUCTURED FIELD COUNT VALUE OF *parametervalue2*.**

**Explanation**

The NEXT LINE DESCRIPTOR IF REUSING DATA parameter in the Line Descriptor (LND) structured field identified in this message has an incorrect value. The value is greater than the COUNT parameter in the Line Descriptor Count (LNC) structured field in the current data map. The LNC and LND structured fields are contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK330I DATA IN A PAGEDEF RESOURCE IS NOT VALID: WHEN THE DATA START POSITION VALUE IS ADDED TO THE DATA LENGTH VALUE IN LND, RCD, OR XMD STRUCTURED FIELD NUMBER *number*, IT EXCEEDS THE FDS STRUCTURED FIELD SIZE VALUE OF *parametervalue*.**

**Explanation**

The Use Fixed Data flag in byte 0 in the Line Descriptor (LND) structured field, in byte 11 in the Record Descriptor (RCD) structured field, or in byte 1 in the XML Descriptor (XMD) structured field was set to B'1'. This indicates that data from Fixed Data Text (FDX) structured fields is to be added to the data placed within the page by the LND, RCD, or XMD structured field. The FDX, XMD, RCD, and LND structured fields are in the page definition.

The DATA START POSITION parameter in the LND, RCD, or XMD structured field indicates the offset of the first byte of data. The DATA LENGTH parameter specifies how many bytes of FDX are to be placed within the page. This error was caused when these two parameters specified more data than the FDX structured fields contain. The number of bytes of data in the FDX structured fields can be found in the SIZE parameter of the Fixed Data Size (FDS) structured field.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK334S DATA IN A PAGEDEF RESOURCE IS INVALID: THE AMOUNT OF FIXED DATA RECEIVED DID NOT AGREE WITH THE VALUE SPECIFIED IN THE FDS STRUCTURED FIELD SIZE PARAMETER.**

### Explanation

The Fixed Data Text (FDX) structured field contained more bytes of data than what was indicated in the SIZE parameter of the Fixed Data Size (FDS) structured field. The FDS and FDX structured fields are contained in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK335S DATA IN A PAGEDEF RESOURCE IS INVALID: THE MEDIUM MAP "*mediummapname*" SPECIFIED IN THE MEDIUM MAP NAME PARAMETER OF CCP STRUCTURED FIELD *ccpidentifier* WAS NOT FOUND.**

### Explanation

The Conditional Processing Control (CCP) structured field has an incorrect value. The MEDIUM MAP NAME parameter in one of the repeating groups of the CCP structured field specifies the token name of a medium map that is used to locate a medium map in the form definition. The name must match the value that is specified in the TOKEN NAME parameter in one of the Begin Medium Map (BMM) structured fields in the current form definition. No medium map with name *mediummapname* was found in the form definition. The CCP structured field is contained in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK337I DATA IN A PAGEDEF RESOURCE IS NOT VALID: IN LND, RCD, OR XMD STRUCTURED FIELD NUMBER *number*, THE CONDITIONAL PROCESSING FLAG WAS SET BUT THE CONDITIONAL PROCESSING CONTROL IDENTIFIER WAS ZERO.**

### Explanation

In the Line Descriptor (LND), Record Descriptor (RCD), or XML Descriptor (XMD) structured field, the Conditional Processing flag had a value of B'1', indicating that the line data to be processed by this LND, RCD, or XMD structured field is to be compared with a value specified in a Conditional Processing Control (CCP) structured field. The CCP IDENTIFIER parameter in the LND, RCD, or XMD structured field is used to find one of the CCP structured fields in the current page definition. This parameter was set to 0, which is not a valid value if the Conditional Processing flag is on. The LND, RCD, XMD, and CCP structured fields are in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK339I DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE IDENTIFIER *identifier* SPECIFIED IN THE CONDITIONAL PROCESSING CONTROL IDENTIFIER PARAMETER IN LND, RCD OR XMD STRUCTURED FIELD NUMBER *number* WAS NOT FOUND.**

**Explanation**

In the Line Descriptor (LND), Record Descriptor (RCD), or XML Descriptor (XMD) structured field, the Conditional Processing flag had a value of B'1', indicating that the line data to be processed by this LND, RCD, or XMD structured field is to be compared with a value that is specified in a Conditional Processing Control (CCP) structured field. The CCP IDENTIFIER parameter in the LND, RCD, or XMD structured field is used to find one of the CCP structured fields in the current page definition. However, the identifier that is specified in the LND, RCD, or XMD structured field that is identified in this message does not match the value that is specified in the CCP IDENTIFIER parameter in any of the CCP structured fields in the current page definition. The LND, RCD, XMD, and CCP structured fields are in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK340I DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE NEXT LINE DESCRIPTOR IF CONDITIONAL PROCESSING PARAMETER VALUE IN LND, RCD OR XMD STRUCTURED FIELD NUMBER *number* IS *value1*. THIS EXCEEDS THE LNC STRUCTURED FIELD COUNT VALUE OF *value2*.**

**Explanation**

The NEXT LINE DESCRIPTOR IF CONDITIONAL PROCESSING parameter in the Line Descriptor (LND), Record Format Descriptor (RCD), or XML Descriptor (XMD) structured field has an incorrect value. The value is greater than the COUNT parameter in the Line Descriptor Count (LNC) structured field in the current data map. The LNC, LND, RCD, and XMD structured fields are contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK342I DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE NEXT LINE DESCRIPTOR IF CONDITIONAL PROCESSING PARAMETER VALUE IN LND, RCD OR XMD STRUCTURED FIELD NUMBER *number* WILL CAUSE AN INFINITE LOOP.**

**Explanation**

The NEXT LINE DESCRIPTOR IF CONDITIONAL PROCESSING parameter in the Line Descriptor (LND), Record Format Descriptor (RCD), or XML Descriptor (XMD) structured field caused an infinite-loop condition. The LND, RCD, and XMD structured fields are in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK343I DATA IN AN INPUT RECORD OR PAGEDEF RESOURCE IS NOT VALID: RELATIVE POSITIONING PLACED DATA OUTSIDE THE LOGICAL PAGE IN THE NEGATIVE Y DIRECTION. THE PRIOR AND CURRENT LND, RCD OR XMD STRUCTURED FIELD NUMBERS ARE *priornumber* AND *currentnumber*.**

**Explanation**

When relative positioning is being used on a Line Descriptor (LND), Record Descriptor (RCD), or XML Descriptor (XMD) structured field, the relative position that is specified for the Y direction can be a negative value. The current LND, RCD, or XMD position (*priornumber*) defines the baseline position from which the relative offset of the current LND, RCD, or XMD is measured.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK344S DATA IN A PAGEDEF RESOURCE IS INVALID: THE NUMBER OF LND OR RCD STRUCTURED FIELDS DOES NOT MATCH THE VALUE SPECIFIED IN THE LNC STRUCTURED FIELD.**

**Explanation**

The number of Line Descriptor (LND) or Record Descriptor (RCD) structured fields that are found in a page definition is either greater than or less than the value specified in the Line Descriptor Count (LNC) structured field. The LND, RDC, and LNC structured fields are in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK346W DATA IN AN INPUT RECORD OR PAGEDEF RESOURCE IS INVALID: A SKIP TO A NONEXISTENT CHANNEL = *channel* ON RECORD NUMBER = *recordnumber* WAS DETECTED WITHIN THE LND STRUCTURED FIELDS. OUTPUT WAS FORCED TO SINGLE SPACING, WHICH MAY CAUSE BLANK PAGES.**

**Explanation**

An attempt was made to skip to a channel not defined in the current data map. The Line Descriptor (LND) structured fields in the page definition are incorrect. During scanning, the entire NEXT LINE DESCRIPTOR IF SKIPPING parameter was not followed because an LND had the End Page If Skipping flag set. This created an infinite loop on the same input record. The LND structured field is contained in the page definition.

**System action**

The record that contains the error was forced to single spacing. When forced single spacing occurs, the carriage control character on the record is ignored. The record is treated as if a X'09' machine control character or a X'40' ANSI control character was specified in the record that caused the error.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK350S DATA IN A PAGEDEF RESOURCE IS INVALID: IN LND STRUCTURED FIELD NUMBER *number*, THE SHIFT-OUT CODED FONT LOCAL IDENTIFIER WAS NON-ZERO BUT THE GENERATE FONT CHANGE FLAG WAS NOT SET.**

**Explanation**

In the Line Descriptor (LND) or Record Descriptor (RCD) structured field that is identified in this message, the Shift-Out Coded Font Identifier was nonzero. The Generate Font Change flag must be set to indicate that the Primary Coded Font Local Identifier is used whenever a shift-in code is processed. However, the Generate Font Change flag had a value of B'0'. The LND or RCD structured field is contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference

for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK353S DATA IN A PAGEDEF RESOURCE IS INVALID: THE DATA LENGTH PARAMETER VALUE IN LND STRUCTURED FIELD NUMBER *number* DOES NOT MATCH THE LENGTH OF COMPARISON STRING PARAMETER VALUE IN CCP STRUCTURED FIELD *ccpidentifier*.**

**Explanation**

In the Line Descriptor (LND) structured field, the value of the DATA LENGTH parameter is used in identifying the field of the current input record for which conditional processing is to be done. This field is to be compared with the Comparison String that is specified in the Conditional Processing Control (CCP) structured field. The length that is specified in the DATA LENGTH parameter in the LND structured field does not match the length that is specified in the LENGTH OF COMPARISON STRING parameter of the CCP structured field. The LND and CCP structured fields are contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK356S DATA IN A PAGEDEF RESOURCE IS INVALID: A PAGE SEGMENT OR OVERLAY WAS REQUESTED IN THE LND OR RCD STRUCTURED FIELD *structuredfield*, BUT THE INLINE OR BASELINE POSITION VALUES WERE SPECIFIED FOR THE LND OR RCD.**

**Explanation**

If any resource object-include triplets are specified in the LND structured field, bits 2 and 3 of bytes 0–1 in the LND structured field must both be set. If any resource object-include triplets are specified in the RCD structured field, bits 2 and 3 of bytes 11–13 in the RCD structured field must both be set.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

None.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK359I AN INLINE MEDIUM MAP WAS ENCOUNTERED IN THE DATA SET, BUT INLINE MEDIUM MAPS ARE NOT SUPPORTED.**

**Explanation**

A Begin Medium Map (BMM) structured field was encountered in the data stream after resources for the data set are processed. ACIF does not support inline medium maps between pages. The data set might be created by a program that creates inline medium maps, but a data set that contains inline medium maps cannot be printed.

**System action**

ACIF stops processing the print data set.

**System programmer response**

See the I/O error message to determine an appropriate action.

**User response**

Correct the error and resubmit the request.

**APK364I THE SET OF MODIFICATIONS SPECIFIED IN THE MCC STRUCTURED FIELD INDICATES DIFFERENT SELECT INPUT SOURCE VALUES FOR THE FRONT AND BACK SIDES OF A DUPLEX SHEET.**

**Explanation**

The Medium Modification Control (MMC) structured field, which is referenced by the Medium Copy Count (MCC) structured field repeating groups, specifies different input source or media type local ID values, along with either tumble or normal duplex. This is an attempt to print the front and back sides of a sheet from different input bins.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

None.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK366I DATA IN AN INPUT RECORD OR PAGEDEF RESOURCE IS NOT VALID: THE ORIENTATION USED WITH RELATIVE POSITIONING IS DIFFERENT THAN THE LAST ORIENTATION USED FOR PRINTING. THE PRIOR AND CURRENT LND, RCD OR XMD STRUCTURED FIELD NUMBERS ARE *priornumber* AND *currentnumber*.**

**Explanation**

When relative positioning is being used on a Line Descriptor (LND), Record Descriptor (RCD), or XML Descriptor (XMD) structured field, the text orientation field of the current LND, RCD, or XMD (*currentnumber*) must match the text orientation field of the LND, RCD, or XMD (*priornumber*) that was last used for positioning data. The prior LND, RCD, or XMD position defines the baseline position from which the relative offset of the current LND, RCD, or XMD is measured.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK367I DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE MAPPING OPTION SPECIFIED IN AN IOB STRUCTURED FIELD WITH LOCAL ID *identifier* IS NOT VALID OR UNSUPPORTED. THE IOB IS INCLUDED WITH LND, RCD, OR XMD STRUCTURED FIELD NUMBER *number*.**

**Explanation**

The Include Object (IOB) structured field in error contained an Output Option value that is not valid, or the printer does not support the Output Option value. The IOB is included by using the Line Descriptor (LND), Record Descriptor (RCD), or XML Descriptor (XMD) structured field identified in this message. The IOB, LND, RCD, and XMD structured fields are contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK368S** **DATA IN A PAGEDEF RESOURCE IS INVALID: THE RESOURCE LOCAL ID *identifier* SPECIFIED IN THE EXTENDED RESOURCE LOCAL ID TRIPLET ON LND OR RCD STRUCTURED FIELD NUMBER *number* WAS NOT FOUND.**

**Explanation**

In the Line Descriptor (LND) or Record Descriptor (RCD) structured field, and Extended Resource Local Identifier triplet specifies a local ID (*identifier*) of an Include Object (IOB) structured field that is to be used to include an object when this LND or RCD is used for printing. The identifier that is specified on the LND or RCD does not match any of the IOB structured fields in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK369S** **DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: STRUCTURED FIELD *structuredfield* HAS AN INCORRECT OBJECT CLASS VALUE IN AN OBJECT CLASSIFICATION TRIPLET.**

**Explanation**

The Object Classification (X'10') triplet in the structured field that is specified in the message has an incorrect object class value. Possible incorrect class values for each structured field are:

- Map Data Resource (MDR)
  - Non-presentation object container is included in a repeating group.
  - Object container or IOCA embedded in a page or overlay has a data object font that is mapped in the Object Environment Group.
- Include Object (IOB) or Preprocess Presentation Object (PPO)

  Non-presentation object container, data object font (DOF), or non-DOF secondary resource is specified.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK380S THE REGISTRATION ID (*identifier*) OF AN OBJECT CONTAINER RESOURCE, NAME *resourcename*, DOES NOT MATCH THE CORRESPONDING REGISTRATION ID FOR THE INVOKING JCL KEYWORD OR STRUCTURED FIELD.**

**Explanation**

An object container resource was requested through a JCL keyword, or an Include Object (IOB) or Map Data Resource (MDR) structured field, but the Object Classification triplet in the Begin Object Container (BOC) structured field did not match the corresponding registration ID. For a list of registration IDs and their assumed functions, see *Mixed Object Document Content Architecture Reference*.

**System action**

ACIF stops processing the input file and issues a message that identifies the position of the structured field in the file or resource.

**System programmer response**

If a licensed program was used to create the structured fields for the object container that contains the error, verify that the input to that program is valid.

**User response**

If you created the structured fields for the object container resource, ensure that the registration ID corresponds either to the keyword used to call the resource or to the registration ID specified in the Object Classification triplet that is specified on the IOB or MDR structured field.

**APK381S DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE REGISTERED OBJECT ID IN THE OBJECT CLASSIFICATION TRIPLET ON A *structuredfield* STRUCTURED FIELD IS NOT SPECIFIED.**

**Explanation**

The registered object ID is 0 in the Object Classification triplet. Object containers require a registered ID to be specified.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured field with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields, contact your system programmer.

**APK384S DATA IN A FORMDEF RESOURCE IS INVALID: THE SET OF MODIFICATIONS SPECIFIED IN THE MCC STRUCTURED FIELD INCLUDES CONFLICTING PRESENTATION SYSTEM SETUP ID VALUES.**

**Explanation**

Multiple MMC structured fields that are referenced by the MCC structured field do not use the exact same set of Presentation System Setup ID values.

**System action**

ACIF stops processing the print data set.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the MCC structured field. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the MCC has no errors, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK385S** **DATA IN A FORMDEF RESOURCE IS INVALID: THE MODIFICATIONS SPECIFIED IN THE MMC STRUCTURED FIELD *structuredfield* INCLUDE UNPAIRED *keyword1* AND *keyword2* KEYWORDS.**

**Explanation**

The keywords must be paired in the Medium Modification Control (MMC) structured field. This form definition has one or the other keyword but not both, or the keyword pairs are not adjacent. The MMC structured field is contained in the form definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK386I** **DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A REQUIRED TRIPLET WITH ID *identifier* WAS MISSING FROM AN *structuredfield* STRUCTURED FIELD.**

**Explanation**

When the message specifies a triplet identifier of X'18', the structured field contains at least one Function Set triplet (X'8F'), but does not contain a X'18' interchange triplet with a Presentation Type of X'01'.

When the structured field is an Include Object (IOB) and the identifier is X'22', the Extended Resource Local Identifier (X'22') triplet is required when the IOB structured field is contained in a page definition.

When the structured field is an IOB or Preprocess Presentation Object (PPO) and the identifier is X'4B', the X- or Y-axis origin for object content or an object area size (X'4C') triplet was specified on the IOB or PPO, but no measurement unit (X'4B') triplet was specified. The structured field is contained in a print data set if it is a PPO. The structured field is contained in a print data set, overlay, or page definition if it is an IOB. When the structured field is an IOB and the identifier is X'22', the Extended Resource Local Identifier (X'22') triplet is required when the IOB structured field is contained in a page definition.

When the triplet identifier is X'8F', the Function Set (X'8F') triplet is missing when the Interchange Set (X'18') triplet specifies function set support on the structured field in a print data set.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to place the IOB, PPO, Begin Document (BDT), or Begin Print File (BPF) structured field in the print data set or resource, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you placed the IOB, PPO, BDT, or BPF structured field in the print data set or resource, correct the error and resubmit the print request. See *Mixed Object*

*Document Content Architecture Reference* for more information about the structured field. If you used a program to place the IOB, PPO, BDT, or BPF structured field in the print data set or resource, contact your system programmer.

**APK387S** **DATA IN AN INPUT RECORD IS NOT VALID: A PARAMETER IN AN *structuredfield* STRUCTURED FIELD CONTAINS UNACCEPTABLE DATA.**

### Explanation

One of the parameters in the structured field is not valid. If the structured field is an Include Object (IOB), one of these caused the problem:

- The specified object type is not valid.
- The x or y offset of the object area or the rotation value are not explicitly specified when the reference coordinate system is set to X'00'.

If the structured field is a Preprocess Presentation Object (PPO), one of these caused the problem:

- The specified object type is not valid.
- The x or y offset of the object area is not valid.

If the structured field is a Presentation Text Data Descriptor (PTD), the x or y text presentation extent is not valid.

### System action

ACIF stops processing the input data set.

### System programmer response

No response is necessary.

### User response

If you placed the IOB structured field in the input data set or overlay, correct the error and resubmit the ACIF job. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If you used a program to place the IOB structured field in the print data set or overlay, contact your system programmer.

**APK388S** **DATA IN A PAGE SEGMENT IS INVALID: *structuredfield* STRUCTURED FIELD IS NOT ALLOWED IN A PAGE SEGMENT INCLUDED WITH AN IOB.**

### Explanation

Only MO:DCA-P page segments are allowed to be included with an Include Object (IOB) structured field. MO:DCA-P page segments cannot contain IM1 image or PTOCA data.

### System action

ACIF stops processing the input data set.

### System programmer response

No response is necessary.

### User response

If you placed the IOB structured field in the input data set or overlay, correct the error and resubmit the ACIF job. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If you used a program to place the IOB structured field in the print data set or overlay, contact your system programmer.

**APK389S** **DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: THE FONT RESOLUTION AND METRIC TECHNOLOGY TRIPLET SPECIFIES AN INCORRECT VALUE.**

### Explanation

An incorrect value is specified for the metric technology, the unit base, or the units per unit base field in the Font Resolution and Metric Technology triplet (X'84'). The triplet is specified on a Map Coded Font (MCF) structured field, which can be in a print data set or overlay.

### System action

ACIF stops processing the print data set.

### System programmer response

If an IBM licensed program was used to create the structured fields with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set or the resource, correct the error and resubmit the job to ACIF. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK390S** **DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: THE *structuredfield* STRUCTURED FIELD CONTAINS A *triplet* TRIPLET THAT HAS AN INVALID VALUE. THE INVALID VALUE STARTS IN BYTE *byte* OF THE TRIPLET.**

**Explanation**

An incorrect value was specified for a field that starts in byte offset of the triplet that is identified in this message. The triplet is specified on the structured field that is identified in this message.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the object, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* or *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the object, contact your system programmer.

**APK392I** **DATA IN A FORMDEF RESOURCE IS NOT VALID: THE SCOPE VALUE IN THE MFC IS NOT VALID. EITHER DOCUMENT LEVEL OR PRINT FILE LEVEL FINISHING WAS SPECIFIED IN THE MEDIUM MAP OR MEDIUM LEVEL FINISHING WAS SPECIFIED IN THE DEG.**

**Explanation**

Either a Document Environment Group (DEG) or a medium map in the current form definition contains a Medium Finishing Control (MFC) structured field with an incorrect value that is specified for the scope.

**System action**

The MFC is ignored and processing continues. ACIF might issue more messages that identify the processing environment in which the error occurred.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, report the problem to your service representative.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the problem might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK395I** **A FORMDEF RESOURCE REQUESTED A MEDIA EJECT CONTROL TO THE NEXT BACK-SIDE AND DUPLEX=NO WAS SPECIFIED ON THE OUTPUT STATEMENT.**

**Explanation**

When a media eject control to the next back-side is specified in a form definition, the DUPLEX=NO keyword on the OUTPUT statement cannot be used to change from duplex (specified in the form definition) to simplex. The reason is that an incompatible request is being made; you cannot eject to the next back-side when simplexing.

When a media eject control to the next back-side is specified in the form definition and the form definition requests normal or tumble duplex, the only valid option for the duplex keyword is to specify either DUPLEX=NORMAL or DUPLEX=TUMBLE on the OUTPUT statement.

**System action**

ACIF stops processing the current data set and issues more messages that identify the processing environment when the error was found.

**System programmer response**

None.

#### User response

Resubmit the job without requesting the duplex keyword on the OUTPUT statement.

**APK396I DATA IN A FORMDEF RESOURCE IS INVALID: THE OUTPUT BIN SELECTION VALUE IN MMC STRUCTURED FIELD, ID *identifier*, IS NOT ACCEPTABLE.**

#### Explanation

In the Medium Modification Control (MMC) structured field whose identifier is specified in the message text, the output bin selection parameter value was not valid. The MMC structured field is contained in the form definition.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK397I THE SET OF MODIFICATIONS SPECIFIED IN THE MCC STRUCTURED FIELD INDICATES DIFFERENT OUTPUT BIN VALUES FOR THE FRONT AND BACK SIDES OF A DUPLEX SHEET.**

#### Explanation

The Medium Modification Control (MMC) structured fields, which are referenced by the Medium Copy Count (MCC) structured field repeating groups, specify different output bin values along with either tumble or normal duplex. This is an attempt to place the front and back sides of a sheet into different output bins.

#### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

If the error involves separator pages or the message data set, use the information that is provided in the User Response section to correct the error.

#### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK398I DATA IN A FORMDEF RESOURCE IS INVALID: THE SET OF MODIFICATIONS SPECIFIED IN THE MMC STRUCTURED FIELD, ID *identifier*, INCLUDES DUPLICATE CONFLICTING VALUES FOR THE *keyword* KEYWORD.**

#### Explanation

The Medium Modification Control (MMC) structured field contains duplicate conflicting values for the keyword that is identified in the message text. The MMC structured field is in the form definition.

#### System action

ACIF issues this message and continues processing, ignoring the duplicate keyword.

#### System programmer response

If an IBM licensed program was used to create the structured fields for the object with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

If you created the structured fields for the form definition, correct the MMC structured field and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the MMC has no errors, the error might be an

ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK400S THE *parameter* NUMBER VALUE IS NOT NUMERIC.**

**Explanation**

A numeric value must be specified after the parameter.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Use a numeric value after the parameter and resubmit the job.

**APK401S THE *parameter* NAME MUST BE DELIMITED WITH QUOTES.**

**Explanation**

The attribute name of the parameter must begin and end with single quotation marks.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Use single quotation marks before and after the attribute name in the parameter.

**APK402S THE PARAMETER "*parameter*" IS INVALID.**

**Explanation**

A parameter that is not valid for ACIF was specified.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the parameter and resubmit the job.

**APK403S THE REQUESTED RESOURCE *number* IS UNKNOWN.**

**Explanation**

A resource I/O is requested, but the resource type is unknown to ACIF. This condition is caused by an ACIF logic error. The resource type codes are:

| **Type** | **Resource** |
|---|---|
| **1** | Print input file |
| **2** | FORMDEF file |
| **3** | PAGEDEF file |
| **4** | OVERLAY file |
| **5** | SEGMENT file |
| **6** | Coded FONT file |
| **7** | Coded PAGE file |
| **8** | FONT Character Set file |
| **9** | FONT Metric file |
| **10** | FONT Shape file |
| **20** | Print output file |
| **21** | Messages output file |
| **22** | SPOOL file |
| **23** | Dummy input file |
| **24** | Dummy output file |
| **25** | Parameter file |
| **26** | Resource Object file |

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Contact your service representative.

**APK404S THE ATTRIBUTE NAME USED IN *indexn* HAS AN IMPROPER USE OF QUOTES.**

**Explanation**

An unpaired set of quotation marks was found in the attribute name for an INDEX*n* parameter.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the INDEX*n* parameter and resubmit the job.

**APK405S A VALUE OF "*value*" IS INVALID FOR PARAMETER "*parameter*".**

**Explanation**

The value that is supplied for a parameter is not valid.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the parameter value and resubmit the job.

**APK406S PARAMETER "*parameter*" HAS TOO MANY DATA SETS SPECIFIED.**

**Explanation**

More than eight data sets are supplied for the parameter.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the number of data sets and resubmit the job.

**APK407S A RESTYPE PARAMETER OF "*value*" IS NOT VALID.**

**Explanation**

A resource type of NONE was found with another value in the RESTYPE parameter. Examples of other values are FONT, OVLY, FDEF, or PSEG. A resource type of NONE cannot be specified with another value.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the RESTYPE parameter and resubmit the job.

**APK408S A VIRTUAL STORAGE REQUEST WAS UNSUCCESSFUL - REQUEST SIZE *storagerequestsize*, RETURN CODE *returncode*.**

**Explanation**

ACIF made an unsuccessful attempt to obtain virtual storage. This message indicates the storage size and the return code from the system macro.

**System action**

ACIF stops.

**System programmer response**

To interpret the return code, see the documents about application development macros for your operating system.

**User response**

On z/OS operating systems, increase the REGION size and resubmit the job.

**APK409I A DDNAME FOR *parameter* WAS NOT SUPPLIED. "*default*" WAS USED.**

### Explanation

No DD name was specified for either the MSGDD or the PARMDD parameter.

### System action

If the missing DD name was MSGDD, the DD name assigned to SYSPRINT was used. If the missing DD name was PARMDD, the DD name assigned to SYSIN was used.

### System programmer response

No response is necessary.

### User response

If the DD name used was not acceptable, specify a DD name for the parameter and submit the job again.

## APK410S AN ACIF STORAGE REQUEST WAS UNSUCCESSFUL - REQUEST SIZE *storagerequestsize*, *requesttype* RETURN CODE *returncode*.

### Explanation

An unsuccessful attempt was made to obtain or free ACIF subpool storage. If you requested indexing on values that do not occur in the data, ACIF often runs out of storage while it is trying to find the second page. For example, if you specify TRIGGER1=*,1,X'F1' but your data does not contain any X'F1' carriage controls, ACIF can run out of storage. This error message returns the following information:

- Storage request size
- Request type
- Return code

### System action

ACIF stops.

### System programmer response

Use the information that is provided in the message to correct the error and resubmit the job.

### User response

If you requested indexing, verify that your data matches the values that you specified on the TRIGGER parameter.

## APK411S AN ERROR OCCURRED WHILE ATTEMPTING TO *action* THE DDNAME *ddname*, RETURN CODE *returncode*.

### Explanation

The file I/O macro made an unsuccessful attempt to read from, write to, or close the named DD. The return codes are:

| Code | Description |
|---|---|
| 0 | Successful. |
| 8 | Data record longer than LRECL or buffer. |
| 10 | Storage allocation/deallocation failed. |
| 12 | End of file detected. |
| 13 | Disk or PDS directory is full. |
| 28 | File not found. |
| 310 | File format not valid. |

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Use the information that is provided in the return code to correct the problem. If the message displays a return code that is not listed in the explanation, contact your service representative.

## APK412I MODULE *modulename* HAS RETURNED WITH RETURN CODE *returncode.*

### Explanation

A nonzero return code is returned from the called module. This message indicates that an abnormal occurrence took place in the called module. This message is informational and further action takes place in higher-level modules if required.

**Note:** A return code of 999 indicates that the user's input exit returned a zero length record.

### System action

None; this message is for information only.

**System programmer response**

No response is necessary.

**User response**

See the accompanying message to determine a response.

**APK413S ATTEMPTED *action* RESOURCE FILE "*ddname*", RESOURCE MEMBER NAME "*membername*" FAILED, RETURN CODE *returncode*.**

**Explanation**

An attempt to open, close, read, or write a resource failed. This message indicates that an abnormal occurrence took place in the called module. This message is informational and further action takes place in higher-level modules if required. If you received this message for a Data Object Font (DOF) Descriptor triplet, the resource name is not a typical member name and the name is translated to ASCII or EBCDIC for display purposes. If the resource name cannot be translated, it is presented as a hexadecimal value. The return codes are:

| Code | Description |
|---|---|
| **0** | Successful. |
| **8** | Data record longer than LRECL or buffer. |
| **9** | File is not supported type. |
| **10** | Storage allocation/deallocation failed. |
| **12** | End of file detected. |
| **13** | Disk or PDS directory is full. |
| **14** | RECFM not valid. |
| **28** | File not found. |
| **310** | File format not valid. |

**System action**

None; this message is for information only.

**System programmer response**

No response is necessary.

**User response**

See the accompanying message to determine a response. If the message displays a return code that is not listed in the explanation, contact your service representative.

**APK414I THE FOLLOWING PARAMETERS WILL BE USED FOR THIS RUN:**

**Explanation**

This message is issued before APK415I to begin the listing of the parameters to be used for this run.

**System action**

None.

**System programmer response**

No response is necessary.

**User response**

No response is necessary.

**APK415I *parameter value***

**Explanation**

For this run, the parameter that is listed is used with the associated value.

**System action**

None.

**System programmer response**

No response is necessary.

**User response**

No response is necessary.

**APK417I REQUEST FOR UNKNOWN MESSAGE *number*.**

**Explanation**

ACIF tried to display an undefined message.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

### User response

Report the problem to your service representative.

**APK418S THE MAXIMUM RECORD ID WAS EXCEEDED.**

### Explanation

The current job contains more than 999999999 documents.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Break up the job into a smaller number of documents.

**APK419S USER *exittype* EXIT *programname* RETURNED CODE *returncode*.**

### Explanation

An input, output, or resource user exit program returned a nonzero return code.

**Note:** A return code of 999 indicates that the user's input exit returned a zero length record.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Correct the error in the exit program and resubmit the job.

**APK420S AN ERROR OCCURRED WHILE ATTEMPTING TO OPEN "*dataset*". RETURN CODE *returncode*.**

### Explanation

An attempt to open a data set failed. This message is informational and further action takes place in higher-level modules if required. If you received this message for a Data Object Font (DOF) Descriptor triplet, the resource name is not a typical member name and the name is translated to ASCII or EBCDIC for display purposes. If the resource name cannot be translated, it is presented as a hexadecimal value. The return codes are:

| Code | Description |
|---|---|
| **0** | Successful. |
| **8** | Data record longer than LRECL or buffer. |
| **10** | Storage allocation/deallocation failed. |
| **12** | End of file detected. |
| **13** | Disk or PDS directory is full. |
| **28** | File not found. |
| **32** | ACIF message catalog not found in paths specified by NLSPATH environment variable. ACIF uses default message catalog file `/usr/lib/nls/msg/en_US/acif.cat`. |
| **36** | Default message catalog not accessible. Check permissions. |
| **200** | Resource access table (RAT) not valid. For example, RAT uploaded as a text file instead of a binary file. |
| **310** | File format not valid. |

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Use the information that is provided in the return code to correct the problem. If the message displays a return code that is not listed in the explanation, contact your service representative.

**APK421S AN ERROR OCCURRED WHILE ATTEMPTING TO CLOSE "*dataset*". RETURN CODE *returncode*.**

### Explanation

An attempt to close a data set failed. This message is informational and further action takes place in higher-level modules if required. The return codes are:

**Code**
: **Description**

**0**
: Successful.

**8**
: Data record longer than LRECL or buffer.

**10**
: Storage allocation/deallocation failed.

**12**
: End of file detected.

**13**
: Disk or PDS directory is full.

**28**
: File not found.

**32**
: ACIF message catalog not found in paths specified by NLSPATH environment variable. ACIF uses default message catalog file `/usr/lib/nls/msg/en_US/acif.cat`.

**36**
: Default message catalog not accessible. Check permissions.

**310**
: File format not valid.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Use the information that is provided in the return code to correct the problem. If the message displays a return code that is not listed in the explanation, contact your service representative.

## APK422S AN ERROR OCCURRED WHILE ATTEMPTING TO READ "*dataset*". RETURN CODE *returncode*.

### Explanation

An attempt to read a data set failed. This message is informational and further action takes place in higher-level modules if required. The return codes are:

**Code**
: **Description**

**0**
: Successful.

**8**
: Data record longer than LRECL or buffer.

**10**
: Storage allocation/deallocation failed.

**12**
: End of file detected.

**13**
: Disk or PDS directory is full.

**28**
: File not found.

**32**
: ACIF message catalog not found in paths specified by NLSPATH environment variable. ACIF uses default message catalog file `/usr/lib/nls/msg/en_US/acif.cat`.

**36**
: Default message catalog not accessible. Check permissions.

**64**
: Empty input file (specified with INPUTDD).

**310**
: File format not valid.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Use the information that is provided in the return code to correct the problem. If the message displays a return code that is not listed in the explanation, contact your service representative.

## APK423S AN ERROR OCCURRED WHILE ATTEMPTING TO WRITE "*dataset*". RETURN CODE *returncode*.

### Explanation

An attempt to write a data set failed. This message is informational and further action takes place in higher-level modules if required. The return codes are:

**Code**
: **Description**

**0**
: Successful.

**8**
: Data record longer than LRECL or buffer.

**10**
: Storage allocation/deallocation failed.

**12**
: End of file detected.

**13**
: Disk or PDS directory is full.

**28**
: File not found.

**32**
: ACIF message catalog not found in paths specified by NLSPATH environment variable. ACIF uses default message catalog file `/usr/lib/nls/msg/en_US/acif.cat`.

**36**
: Default message catalog not accessible. Check permissions.

**310**
: File format not valid.

#### System action

ACIF stops.

#### System programmer response

No response is necessary.

#### User response

Use the information that is provided in the return code to correct the problem. If the message displays a return code that is not listed in the explanation, contact your service representative.

---

**APK424I PARAMETER "RESFILE=PDS" IS ONLY VALID UNDER MVS, DEFAULTING TO "RESFILE=SEQ".**

#### Explanation

The supplied value for the RESFILE parameter is valid only for z/OS; it is incorrect for other operating systems.

#### System action

ACIF produces a sequential resource file.

#### System programmer response

No response is necessary.

#### User response

No response is necessary.

---

**APK425S USER *type* EXIT "*program*" WAS NOT LOADED.**

#### Explanation

The user exit program that is named on the exit's DD parameter was not loaded. Either it does not exist or system API calls in the exit were not resolved at run time.

#### System action

ACIF stops.

#### System programmer response

No response is necessary.

#### User response

Correct your exit program and rerun ACIF.

---

**APK426S PARAMETER MISMATCH: RESTYPE *type* SPECIFIED = YES, BUT NO SUPPORTING LIBRARY DEFINITIONS WERE SUPPLIED.**

#### Explanation

The resource type *type* was specified on the RESTYPE parameter, but no DD parameter for that resource type was supplied in the ACIF parameter file.

#### System action

ACIF stops.

#### System programmer response

No response is necessary.

#### User response

Correct the parameters and resubmit the job.

---

**APK427I AN ERROR OCCURRED WITH FILEDEF "*filename*", RETURN CODE= *rc*, THE DEFAULT OF "*filename*" "*filetype*" "*filemode*" FOR "*ddname*" WILL BE USED.**

#### Explanation

An incorrect *filename* was supplied. The defaults that are listed are used instead.

#### System action

ACIF continues.

#### System programmer response

No response is necessary.

#### User response

No response is necessary.

**APK428S** **A "*resource*" HAS BEEN REQUESTED, BUT NO NAME WAS GIVEN.**

**Explanation**

The resource that is listed in the message was requested to be handled by ACIF, but the name to get was not passed to ACIF. This condition is caused by an ACIF logic error. If you received this message for a Data Object Font (DOF) Descriptor triplet, the resource name is not a typical member name and the name is translated to ASCII or EBCDIC for display purposes. If the resource name cannot be translated, it is presented as a hexadecimal value.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Contact your service representative.

**APK431I** **INDEXING WITH MASK PARAMETER IS NOT SUPPORTED WITH UNICODE CODE PAGE *codepage*.**

**Explanation**

The user specified the MASK parameter for indexing and also specified Unicode code page *codepage* with the CPGID parameter. However, indexing with a MASK and Unicode data is not supported.

**System action**

ACIF stops processing.

**System programmer response**

No response is necessary.

**User response**

Specify indexing without the MASK parameter or use an ASCII or EBCDIC code page instead of a double-byte code page. These Unicode code pages cannot be specified on the CPGID parameter when masking data:

- 1200
- 1232
- 13488
- 17584

**Note:** This might also require a change to your application data.

**APK432I** **INCORRECT VALUE SPECIFIED FOR TRIGGER COLUMN RANGE.**

**Explanation**

When a column range is specified in the TRIGGER parameter, the column values must be in the range 1 - 32756. The columns cannot be zero, and the ending column must be greater than the beginning column.

**System action**

ACIF stops processing.

**System programmer response**

No response is necessary.

**User response**

Correct the parameter and run ACIF again.

**APK435W** **THE *ddname* DD STATEMENT SPECIFIED FOR *parameter* IS MISSING.**

**Explanation**

An ACIF DD parameter specified a DD name that was not specified in the JCL (z/OS or VSE) or FILEDEF statement (VM).

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Ensure that the ACIF parameter specifies a DD name that is defined in the job commands.

**APK436S** **THE GROUPNAME VALUE "*value*" IS NOT WITHIN THE ALLOWABLE RANGE.**

**Explanation**

ACIF processing encountered the GROUPNAME parameter with a specified INDEX number that is not valid. The INDEX range is 1 - 128.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the resource and resubmit the job.

**APK437S (TYPE=FLOAT) MAY NOT BE SPECIFIED FOR TRIGGER1.**

**Explanation**

The 'TYPE=FLOAT' subparameter is not valid for TRIGGER1.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the parameter and rerun ACIF.

**APK438S THE VALUE SPECIFIED FOR *parameter1* CONFLICTS WITH THE VALUE SPECIFIED FOR *parameter2*.**

**Explanation**

The value that is specified for the first parameter conflicts with the value that is specified for the second parameter.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the parameters and rerun ACIF.

**APK440I ACIF AT *aparnumber* HAS COMPLETED NORMALLY WITH RETURN CODE *returncode*.**

**Explanation**

ACIF at the maintenance level that is indicated by the APAR number has completed with the return code shown.

**System action**

This message is for information only.

**System programmer response**

No response is necessary.

**User response**

See any accompanying messages to determine a response.

**APK441I ACIF AT *aparnumber* HAS COMPLETED ABNORMALLY WITH RETURN CODE *returncode*.**

**Explanation**

ACIF at the maintenance level that is indicated by the APAR number has completed with one of these return codes:

| Code | Description |
|---|---|
| 4 | Warning; processing continues. |
| 8 | Error; processing stops. Data might be missing from the output. |
| 12 | Severe error; processing stops. |
| 16 | Unrecoverable error; processing stops. |

**System action**

This message is for information only.

**System programmer response**

No response is necessary.

**User response**

See any preceding messages to determine a response. If TRACE=YES is specified on z/OS and Generalized Trace Facility (GTF) is running, you might receive a return code 4 with no other messages, which you can ignore.

**APK442S ACIF HAS BEEN INVOKED WITHOUT ANY PARAMETERS.**

**Explanation**

ACIF needs a minimum number of parameters to function.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Specify the INPUTDD, FORMDEF, CC, and PAGEDEF parameters.

**APK443S A BEGIN COLUMN SPECIFICATION FOR FIELD*n* IS <= 0. SUCH A SPECIFICATION IS ONLY VALID WHEN (BASE=TRIGGER) IS ALSO SPECIFIED.**

**Explanation**

FIELD*n* was specified with a column offset less than or equal to zero, but (BASE=TRIGGER) was not also specified. Negative column offsets in a FIELD specification are only valid when (BASE=TRIGGER) is also specified.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the ACIF FIELD*n* parameter specification and resubmit the job.

**APK444S MULTIPLE COLUMNS WERE SPECIFIED FOR FIELD*n* WHICH IS DEFINED WITH (BASE=TRIGGER). ONLY ONE COLUMN MAY BE SPECIFIED WHEN A FIELD IS DEFINED WITH (BASE=TRIGGER).**

**Explanation**

FIELD*n* was specified with multiple columns and (BASE=TRIGGER). Only one column can be specified for a field that is also specified with (BASE=TRIGGER).

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the ACIF FIELD*n* parameter specification and resubmit the job.

**APK445S INDEX*n* WHICH IS DEFINED AS EITHER (TYPE=PAGERANGE) OR (TYPE=GROUPRANGE) INCLUDES FIELD*n* WHICH IS DEFINED AS (BASE=TRIGGER). THIS COMBINATION IS INVALID.**

**Explanation**

INDEX*n* was specified as (TYPE=PAGERANGE) or (TYPE=GROUPRANGE) and with a FIELD*n* that was defined as (BASE=TRIGGER). This combination is not supported.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the ACIF parameters and resubmit the job.

**APK446S USE OF FIELD*n* BY INDEX*n* IS INVALID. ONLY ONE FIELD IS ALLOWED IN AN INDEX DEFINED AS (TYPE=PAGERANGE) OR (TYPE=GROUPRANGE).**

**Explanation**

More than one field was specified for INDEX*n*, which is defined as either (TYPE=PAGERANGE) or (TYPE=GROUPRANGE). This is not valid.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the ACIF parameters and resubmit the job.

**APK447S THE LENGTH, *length1*, OF OFFSET PAIR *pair* FOR FIELD*n* DOES NOT EQUAL THE LENGTH, *length2*, SPECIFIED FOR FIELD*n*.**

### Explanation

The length of a begin-end pair, which is specified by the offset keyword of a field, does not match the length of the field. This is not valid; the lengths must be equal.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Correct the ACIF parameters and resubmit the job.

---

**APK448S INDEXING WAS REQUESTED, BUT NO "TRIGGERn" NOR ANY "FIELD" BASED ON IT WAS SATISFIED WITHIN THE PAGE RANGE SPECIFIED BY THE INDEXSTARTBY PARAMETER.**

### Explanation

Indexing was requested, but the INDEX*n* satisfier was outside the range of pages that is specified in the INDEXSTARTBY parameter, which has a default value of 1. The INDEXSTARTBY condition is only satisfied by group triggers, not floating triggers.

**Note:** This message can also be issued if:

- The input file is empty and the INDEXSTARTBY value is greater than zero.
- The FIELD*n* parameter specifies a negative number but the trigger is found on the first record of the line data.
- An asterisk (*) is specified for the row value with any group TRIGGER*n* parameter other than TRIGGER1.

### System action

ACIF stops processing.

### System programmer response

No response is necessary.

### User response

Correct the INDEXSTARTBY parameter and resubmit the job. If you do not want ACIF to stop processing when it cannot find a group indexing field or when the input file is empty, you must set the parameter to INDEXSTARTBY=0 or specify EXTENSIONS=EMPTYOK.

---

**APK449S INDEX FIELDS REFERENCE OUTSIDE OF THE RECORD, FIELD# *number* INPUT RECORD# *number*.**

### Explanation

The FIELD*n* value that is specified on the INDEX*n* parameter references an area that is outside the length of the requested record.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Correct the parameters and resubmit the job.

---

**APK450S A REQUIRED ACIF PARAMETER *parametername* WAS NOT FOUND IN THE PARAMETER FILE.**

### Explanation

A required ACIF parameter was not found in the parameter file.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Add the missing parameter to the parameter file and resubmit.

---

**APK451S FILE *action* ERROR DURING *ddname* PROCESSING. SVC 99 ERROR *error* INFORMATION CODE *code*.**

### Explanation

An error occurred during the allocation, concatenation, or outadd of AFP resource libraries.

### System action

ACIF stops.

### System programmer response

Use the return code and reason code to determine the cause of the error and information code; then, determine the appropriate response. See your operating system's authorized assembly language programs document for information about the SVC 99.

### User response

Inform your system programmer that this error occurred.

**APK452S** **A *trigger* NUMBER OF *number* IS INVALID FOR *parameternumber*.**

### Explanation

The trigger or record number that is specified in the FIELD*n* or INDEX*n* parameter is not valid.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Triggers used in field definitions must be defined. Make sure that you specified a TRIGGER parameter before you use that trigger number on a FIELD parameter. After you correct the parameter, run ACIF again.

**APK453S** **THE *parameternumber* LENGTH OF *length* IS GREATER THAN THE ALLOWED MAXIMUM OF *maxlength*.**

### Explanation

The combined length of all of the FIELD*n* values on an INDEX*n* parameter is too long.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Check the FIELD*n* and INDEX*n* parameters to find where this happens. Correct the parameter and resubmit the job.

**APK454S** **A VALUE OF *value* IS INVALID FOR *parameternumber*.**

### Explanation

A FIELD*n* parameter value contains incorrect characters.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Correct the parameter value and resubmit the job.

**APK455S** **FIELD*n* USED BY INDEX*n* WAS NOT DEFINED.**

### Explanation

An INDEX*n* parameter referred to a FIELD*n* that was not defined in the parameter file.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Correct the parameters and resubmit the job.

**APK456S** **THE TRIGGER1 RELATIVE RECORD NUMBER IS NOT EQUAL TO ASTERISK.**

### Explanation

The record number that is associated with the TRIGGER1 parameter was not an asterisk.

### System action

ACIF stops.

### System programmer response

No response is necessary.

### User response

Correct the parameter and resubmit the job.

**APK457S TRIGGER1 WAS NOT DEFINED, BUT SECONDARY TRIGGERS ARE PRESENT.**

**Explanation**

TRIGGER1 must be specified when secondary TRIGGER*n* parameters are present.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

If no indexing is required, delete all TRIGGER*n* parameters from the parameter file; otherwise, supply a TRIGGER1 parameter for this run of ACIF.

**APK458S A NON-LITERAL VALUE OF *value* HAS BEEN SUPPLIED FOR *parameternumber*.**

**Explanation**

The supplied TRIGGER*n* value was not a literal.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the parameters and resubmit the job.

**APK459S INDEX NEEDED FOR THE GROUPNAME WAS NOT FOUND.**

**Explanation**

The index that is used for the GROUPNAME contained a field that was based on a floating trigger; however, the trigger was not found. Therefore, the GROUPNAME does not have a value. INDEX1 is used for the GROUPNAME by default.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Use the GROUPNAME parameter to specify an index that does not contain a field based on a floating trigger.

**APK460S TRIGGERS SATISFIED, BUT INDEXES WERE INCOMPLETE AT END-OF-FILE.**

**Explanation**

The TRIGGER*n* parameters that are specified in the parameter file were met, but the end of the file was reached before the INDEX*n* parameters were located.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the parameters and resubmit the job.

**APK461S TRIGGER SUPPLIED, BUT ALL INDEX VALUES WERE LITERALS.**

**Explanation**

A value for TRIGGER*n* was supplied, but all INDEX*n* values were literals.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the parameters and resubmit the job.

**APK462S A TRIGGER PARAMETER WAS SPECIFIED, BUT THE INPUT FILE IS ALREADY INDEXED.**

**Explanation**

The parameter file included a TRIGGER*n* parameter, but the input file contains indexing structured fields. ACIF cannot index a file that is already indexed.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

If you want to create an index object file for the input file, remove all TRIGGER*n* parameters from the ACIF parameter file and resubmit the job.

**APK463S INDEX*n* USED BY THE GROUPNAME PARAMETER WAS NOT DEFINED OR WAS INVALID.**

**Explanation**

The INDEX*n* specified by the GROUPNAME parameter was not defined or the index contained a field that was based on a floating trigger. When the GROUPNAME parameter is not used, INDEX1 is used by default.

**System action**

ACIF stops.

**System programmer response**

No response is necessary.

**User response**

Correct the parameters and resubmit the job.

**APK464S "*token1*" WAS SPECIFIED WHEN "*token2*" EXPECTED.**

**Explanation**

The syntax of the parameter that is printed above this message was incorrect.

**System action**

ACIF continues processing the parameter file, but does not process the report file.

**System programmer response**

None.

**User response**

Correct the value of the parameter and rerun ACIF.

**APK465S INVALID TOKEN "*token*" RECEIVED.**

**Explanation**

The token that is identified in the message was not expected in the parameter that is listed before the message.

**System action**

ACIF continues processing the parameter file, but does not process the report file.

**System programmer response**

None.

**User response**

Correct the value of the parameter and rerun ACIF.

**APK466S A SUB-PARAMETER OF "*subparameter*" IS INVALID FOR PARAMETER "*parameter*".**

**Explanation**

The named subparameter is not supported on the parameter that is listed in the message.

**System action**

ACIF continues processing the parameter file, but does not process the report file.

**System programmer response**

None.

**User response**

Correct the value of the parameter and rerun ACIF.

**APK467S THE NUMBER "*number*" IS NOT SUPPORTED FOR *parameter*.**

**Explanation**

An incorrect number was specified on a FIELD*n*, INDEX*n*, or TRIGGER*n* parameter keyword.

**System action**

ACIF continues processing the parameter file, but does not process the report file.

**System programmer response**

None.

**User response**

Correct the parameter keyword so that the number is within the allowed range for that parameter and rerun ACIF.

**APK468S THE INPUT BUFFER IS TOO SMALL FOR THE PARAMETER VALUE "*value*".**

**Explanation**

The named value was too long for the ACIF internal input buffer.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Use your local problem reporting system to report the error.

**APK469S** **THE LENGTH OF THE VALUE "*value*" EXCEEDS THE MAXIMUM ALLOWED LENGTH FOR THE PARAMETER *parameter* OR THE LENGTH IS ZERO.**

**Explanation**

The length of the named value either exceeds the maximum length or is zero.

**System action**

ACIF continues processing the parameter file, but does not process the report file.

**System programmer response**

None.

**User response**

Correct the value so that its length is greater than zero and within the maximum for that parameter, and then rerun ACIF.

**APK470S** **WHICH BEGINS AT OFFSET *offset* FOR A LENGTH OF *length*.**

**Explanation**

This message is issued following a message that contains the cause of the error.

**System action**

ACIF continues processing the parameter file, but does not process the report file.

**System programmer response**

None.

**User response**

Correct the value so that its length is within the maximum for that parameter and rerun ACIF.

**APK471S** **THE NUMBER OF FIELD VALUES ON THE INDEX PARAMETER EXCEEDED THE MAXIMUM ALLOWED.**

**Explanation**

Too many FIELD*n* values were specified for the INDEX*n* parameter that is printed above this message.

**System action**

ACIF continues processing the parameter file, but does not process the report file.

**System programmer response**

None.

**User response**

Remove the extra FIELD*n* values from the INDEX*n* parameter and rerun ACIF.

**APK472S** **THE NUMBER OF VALUES SPECIFIED FOR THE *parameter* PARAMETER EXCEEDED THE MAXIMUM ALLOWED.**

**Explanation**

Too many values were specified for the named parameter.

**System action**

ACIF continues processing the parameter file, but does not process the report file.

**System programmer response**

None.

**User response**

Consult the ACIF User's Guide for the maximum number of values for this parameter, correct the parameter, and rerun ACIF.

**APK473S** **RECORDRANGE SUB-PARAMETER ALLOWED ONLY IF RECORD VALUE IS '*'.**

#### Explanation

The RECORDRANGE subparameter is only valid on a TRIGGER*n* parameter if the record value was specified as '*'.

#### System action

ACIF stops.

#### System programmer response

None.

#### User response

Either specify an '*' for the record value or remove the RECORDRANGE from the TRIGGER parameter.

### APK474S END-OF-FILE ENCOUNTERED BEFORE CLOSING QUOTE FOUND FOR "*value*".

#### Explanation

The end of the parameter file was found before the closing quotation mark for a literal value.

#### System action

ACIF stops.

#### System programmer response

None.

#### User response

Ensure that the literal value is enclosed in quotation marks and rerun ACIF.

### APK475S THE HEX STRING "*hexstring*" IS NOT VALID.

#### Explanation

The value specified was not a valid hex string.

#### System action

ACIF continues processing the parameter file, but does not process the report file.

#### System programmer response

None.

#### User response

Correct the hex string and rerun ACIF.

### APK476S THE LENGTH OF THE NUMERIC VALUE "*value*" IS INVALID.

#### Explanation

ACIF attempted to write a message that is not defined in the message catalog.

#### System action

ACIF processing continues depending upon the significance of undefined message.

#### System programmer response

None.

#### User response

Inform your service representative that ACIF attempted to write an undefined message, which needs to be corrected.

### APK478I UNABLE TO SAVE DATA OBJECT *filename* TO RESOURCE FILE.

#### Explanation

Data objects resources, such as color management resources (CMRs), or font resources are being saved, but the object that is shown in the message has the embed flag set "off" in the resource access table (RAT). Objects with an embed flag set "off" cannot be placed inline or saved in the output resource library.

#### System action

ACIF skips the specified data object and continues processing the page.

#### System programmer response

In the resource installer product, find the specified object in its library. Select "embed" for the object, and then rerun the resource installer to update the RAT. If embed was already selected for the object, make sure that the RAT is updated in the directory where ACIF is searching for fonts or objects. If the data object is still not saved to the resource file, contact your service representative for assistance.

#### User response

This message is informational and is based on the embed flag setting in the RAT that is created when the data object is installed. If you need to save this object in the resource file, contact your system programmer to set the embed flag "on".

## APK479S REQUESTED DATA OBJECT *filename* NOT FOUND, RETURN CODE *returncode*.

### Explanation

A data object was requested with a Map Data Resource (MDR) structured field in the input file or page definition, but the object cannot be accessed by the resource access table (RAT).

### System action

ACIF stops processing.

### System programmer response

Make sure that both the object and the RAT are installed in the correct directory. If not, use a resource installer product to install the data object in the correct directory and build the RAT entry. If the data object files and the RAT are installed correctly, contact your service representative for assistance.

### User response

The requested data object needs to be installed on the system in one of the directories that is specified with the USERPATH, FONTPATH, or OBJCPATH parameter. The return code indicates why the object was not found and gives the action that the user can do:

**Code**
: **Description and Action**

**10**
: Attempt to assign storage failed.

**20**
: No RAT was found in the paths that are specified with the USERPATH, FONTPATH, or OBJCPATH parameter. Make sure that a correct set of paths is specified for these parameters. Contact your system programmer to verify that the object is installed on your system.

**30**
: RAU handle is null. Contact your service representative.

**40**
: Font is not found. No entry was present for the requested font in the RAT. Make sure that you specified the correct set of paths to search. If the correct paths are specified, contact your system programmer to install the font in the correct directory and update the RAT.

**50**
: Conversion information is missing. The object might not be found if the MDR structured field specifies the object encoding by CPGID/GCSGID names that cannot be mapped to a CCSID, or if the object file name cannot be converted to ASCII or EBCDIC for access on your system. If the object name cannot be converted or mapped, the name is presented as a hexadecimal string. Contact your system programmer for assistance in analyzing this return code.

**70**
: Unable to convert code page or character set to CCSID. Same action as return code 50.

**90**
: RAU handle is missing. Contact your service representative.

**100**
: Path name is missing on AddPath. Contact your service representative.

**110**
: RAT contains incorrect entries. Contact your service representative.

**120**
: ICONV open request has an error. Same action as return code 50.

**130**
: ICONV conversion has an error. Same action as return code 50.

**140**
: RAT type does not match the Find call. Contact your service representative.

**150**
: RAT type is incorrect. Contact your service representative.

**160**
: Requested color management resource (CMR) is not found in the RAT. Make sure that you specified the correct set of paths to search. If the correct paths are specified, contact your system programmer to install the CMR into the correct directory and update the RAT.

**170**
: Requested data object is not found in the RAT. Make sure that you specified the correct set of paths to search. If the correct paths are specified, contact your system programmer to install the object into the correct directory and update the RAT.

**180**
: CMR name is incorrect. Contact your service representative.

**190**
: RAT contains incorrect entries. Contact your service representative.

**200**
Resource access table (RAT) not valid. For example, RAT uploaded as a text file instead of a binary file.

**210**
Font not found inline. An MDR setting requires that the requested data object font is inline in the input file resource group (RESTYPE=ALL or RESTYPE=FONTS). The MDR repeating group flag does not apply to any code page named on a Fully Qualified Name (FQN) triplet with an FQNType of X'85' that is used with the data object font (such as T1V10500). ACIF does not search external libraries when the MDR repeating group flag requires that the data object font is inline.

**APK484S** **INVALID REGULAR EXPRESSION *regularexpression*, OFFSET *offset*, RETURN CODE *returncode*.**

**Explanation**

ACIF failed while it was compiling the regular expression. The offset indicates the location of the error in the regular expression.

| Code | Description |
|---|---|
| x10301 | Syntax error in pattern. |
| x10302 | Invalid state for requested operation. |
| x10303 | Unrecognized escape sequence. |
| x10304 | Incorrect Unicode property. |
| x10305 | Use of feature not yet implemented. |
| x10306 | Incorrectly nested parentheses. |
| x10307 | Decimal number too large. |
| x10308 | Error in {*min*,*max*} interval. |
| x10309 | In {*min*,*max*}, *max* is less than *min*. |
| x1030F | Missing closing bracket. |
| x10310 | In a character range [*x*-*y*], *x* is greater than *y*. |
| x10312 | Maximum allowed match time exceeded. |

For other return codes, contact your service representative.

**System action**

ACIF stops processing.

**System programmer response**

None.

**User response**

Correct the regular expression that is in error and rerun ACIF.

**APK485S** **UREGEX_FIND FAILED, RETURN CODE *returncode*.**

**Explanation**

ACIF failed while it was using a regular expression to match text.

**System action**

See return codes for message APK484S.

**System programmer response**

None.

**User response**

Correct the regular expression and rerun ACIF.

**APK486S** **SEARCHABLE LENGTH OF *length* OF RECORD NUMBER *number* IS GREATER THAN MAXIMUM ALLOWED SIZE OF *size*.**

**Explanation**

ACIF failed while it was using a regular expression trigger to match text. The maximum allowed length to search is 2048 bytes for regular expressions.

**System action**

ACIF stops processing.

**System programmer response**

None.

**User response**

Use a trigger column range.

**APK487S** **MASK AND REGEX CANNOT BOTH BE SPECIFIED FOR A FIELD.**

**Explanation**

ACIF failed while processing a field parameter. The MASK and REGEX subkeywords cannot both be specified on a field parameter.

**System action**

ACIF stops processing.

**System programmer response**

None.

**User response**

Correct the field parameter to use either MASK or REGEX subkeywords and rerun ACIF.

**APK488S FIELD NOT FOUND, FIELD# *number*, INPUT RECORD# *number*.**

**Explanation**

ACIF failed while trying to collect a field based on a group trigger because the field did not match the regular expression; fields based on group triggers must be found.

**System action**

ACIF stops processing.

**System programmer response**

None.

**User response**

Correct the field location, change the regular expression, base the field on a floating trigger, or specify a default value for the field.

**APK489S MASK OR REGULAR EXPRESSION IS REQUIRED FOR FIELD# *number*.**

**Explanation**

ACIF failed while trying to collect a field for an index, which was defined as a GROUPRANGE or PAGERANGE. A field for a GROUPRANGE or PAGERANGE index must use a mask or regular expression.

**System action**

ACIF stops processing.

**System programmer response**

None.

**User response**

Add a mask or regular expression to the FIELD parameter and rerun ACIF.

**APK490S THE ASPRINTED VALUE FOR THE LINEOFFSET PARAMETER CAN ONLY BE USED WITH INPUT DATA THAT CONTAINS ANSI CARRIAGE CONTROLS.**

**Explanation**

ACIF failed while trying to process the LINEOFFSET parameter. The ASPRINTED value for the LINEOFFSET parameter can only be used with input data that contains ANSI carriage controls. To indicate ANSI carriage controls, specify the ACIF parameters CC=YES and CCTYPE=A or CCTYPE=Z.

**System action**

ACIF stops processing.

**System programmer response**

None.

**User response**

Correct the CCTYPE parameter.

**APK491S ATTEMPT TO INDEX A NON-EXISTENT RECORD ASSOCIATED WITH INPUT RECORD# *number* IS NOT ALLOWED, FIELD# *number*.**

**Explanation**

ACIF failed while trying to collect an index field. The relative record number in the FIELD parameter referenced a record that does not exist in the input file, but is only used for line spacing. When the ASPRINTED value for the LINEOFFSET parameter is specified, the relative record numbers in the FIELD parameters must refer to real records in the input file.

**System action**

ACIF stops processing.

**System programmer response**

None.

**User response**

Correct the FIELD parameter.

**APK492I SYSTEM FUNCTION DEREGISTER SERVICE (IFAEDDRG) FAILED, RETURN CODE *returncode*.**

**Explanation**

A call to IFAEDDRG was unsuccessful. The return codes are:

| Code | Description |
|---|---|
| 8 | Environmental error: The deregister service is not available on this system. |
| 12 | User error: The product that is identified by the Prodtoken parameter was not registered. |
| 16 | User error: The service was not called in task mode. |
| 20 | User error: The service was called in cross-memory mode but required PASN=HASN=SASN. |
| 24 | User error: A caller that is running in problem state tried to deregister a product that is registered by an authorized caller (a program that is running in supervisor state or under a system key). |
| 36 | User error: The service was called while holding a system lock. |
| 40 | User error: The service was called while establishing a functional recover routine (FRR). |

**System action**

ACIF processing continues.

**System programmer response**

None.

**User response**

Inform your service representative that you received this error.

**APK494I AN INLINE RESOURCE GROUP WAS FOUND OUT OF SEQUENCE IN THIS DATA SET AND IGNORED. IF THE RESOURCE NAMED IN A FOLLOWING MESSAGE IS IN THE SKIPPED RESOURCE GROUP, FIX THE DATA STREAM AND RESUBMIT THE JOB.**

**Explanation**

An out of sequence inline resource group was encountered in the data stream and ignored. An inline resource group is supported only at the beginning of a data set before any pages. This message is issued because an APK532S message that a resource was not found was issued. The missing resource might be in this ignored inline resource group.

**System action**

ACIF continues.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the object with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured field, correct the error and resubmit the print request. Refer to message APK532S and ensure that only one resource group exists at the beginning of the AFP input file that ACIF is processing. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If you used a program to create the structured field, contact your system programmer.

**APK498S THE AFP INPUT FILES USE MORE *resource* RESOURCES THAN ACIF CAN PROCESS. THE MAXIMUM NUMBER ALLOWED IS *number*.**

**Explanation**

ACIF cannot process the resources that are specified in the message because the maximum number of resources is exceeded.

**System action**

ACIF stops processing the resources that are specified in the message.

**System programmer response**

None.

**User response**

Reduce the number of resources in the data stream to the maximum number allowed or less.

**APK499I INTERNAL ERROR IN MODULE *module* AT FUNCTION *function*.**

### Explanation

An internal error occurred.

### System action

ACIF stops.

### System programmer response

None.

### User response

Contact your service representative for assistance.

**APK532S A *resource* WITH A MEMBER NAME (*membername*) WAS NOT FOUND OR WAS INVALID - RETURN CODE *returncode*.**

### Explanation

The requested form definition, page definition, page segment, medium overlay, or setup file does not exist in any of the available paths. If the form definition member name is blank, the default is DUMMY.

| Return Code | Description |
|---|---|
| **0** | Successful |
| **1** | Permanent I/O error. |
| **2** | Specified number of bytes is zero. |
| **3** | Incorrect data buffer address. |
| **4** | Address not word aligned. |
| **6** | Incorrect FILE_CB@. |
| **7** | Incorrect MODE parameter. |
| **8** | Data record longer than LRECL or buffer. |
| **9** | File is not supported type. |
| **10** | Storage allocation/deallocation failed. |
| **11** | Incorrect record number. |
| **12** | End of file detected. |
| **13** | Disk or PDS directory is full. |
| **14** | RECFM not valid. |
| **15** | Incorrect or unparseable data in a resource or data object file. |
| **20** | Incorrect file ID. |
| **28** | File not found. |
| **51** | Length exceeds maximum. |
| **310** | File format not valid. |

| Reason Code | Description |
|---|---|
| **1** | Resource name is missing. |
| **2** | File system open error. |
| **3** | File system close error. |
| **4** | File system read error. |
| **6** | Resource type error. |
| **7** | File system write error. |
| **8** | Indexer error. |
| **9** | Message write error. |

### System action

ACIF stops.

### System programmer response

None.

### User response

Correct the parameters and run ACIF again.

**APK900S MISSING DAT POINTER IN CCM.**

### Explanation

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK901S MISSING FORMDEF POINTER IN CCM.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK902S MISSING PAGEDEF POINTER IN CCM.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK903S MISSING OBJECT STACK POINTER IN CCM.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK904S MISSING CODE PAGE POINTER IN CCM.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK905S MISSING FONT METRIC POINTER IN CCM.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK906S UNEXPECTED OTHERWISE STATEMENT ENCOUNTERED.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK907S CCM CANNOT FIND REQUESTED MEDIUM MAP.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK908S CCM CANNOT FIND REQUESTED DATA MAP.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK909S CCM CANNOT FIND REQUESTED MEG.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK910S INPUT BIN LIST CHANGED DURING PROCESSING.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK911S DAT DID NOT SPECIFY ANY INPUT BIN INFORMATION.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK912S OVERLAY LOCAL ID HAS BEEN CHANGED IN LIST.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK913S STARTING COPY COUNT EXCEEDS TOTAL COPIES IN MM.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK914S CONDITIONAL PROCESSING INFORMATION PASSED TO CCM AT DOCUMENT INTERFACE, BUT PAGEDEF DOES NOT REQUEST CONDITIONAL PROCESSING.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK915S ACIF REQUESTED CODE PAGE DEALLOCATION AS WELL AS CODE PAGE PROCESSING.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK916S ACIF REQUESTED ACTIVATION OF AN OUTLINE FONT CHARACTER SET, BUT DOES NOT SUPPORT OUTLINE FONTS.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK917S ACIF REQUESTED ACTIVATION OF A FONT RESOURCE, BUT THE GLOBAL NAME WAS NOT PROVIDED OR HAD AN INCORRECT LENGTH.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK918S NO FREQUENT FONT TABLE OR FGID LOOK ASIDE TABLE WAS PROVIDED TO *modulename*.**

**Explanation**

An internal error occurred in ACIF.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Inform your service representative that you received this message that indicates an internal error.

**APK919S THE CCM COMPONENT OF ACIF HAS USED UP ITS OBJECT STACK AREA IN *modulename*.**

**Explanation**

The common conversion machine (CCM) component of ACIF ran out of its object stack area. This might be a data stream error or a logic error. A begin structured field must have a matching end structured field that follows it in the data stream. If this requirement is not met, the CCM can run out of its object stack area.

**System action**

ACIF stops.

**System programmer response**

None.

**User response**

Check the data stream to make sure each begin structured field has a matching end structured field that follows it. If this is not true, correct the data stream and resubmit the job to ACIF. If the data stream meets the begin structured field requirement, this message indicates an internal logic error. Inform your service representative that you received this message that indicates an internal error.

**APK921S NO RECORD LENGTH WAS PASSED TO CCM WHEN PROCESSING AN OBJECT CONTAINER RESOURCE.**

**Explanation**

This abend is issued by module APRMSGEX. No record length was passed to common conversion maching (CCM) when an object container resource was processed. This is a logic error.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

This ACIF abend reason code indicates a logic error. Contact your service representative for assistance with this error code.

**User response**

None.

**APK2003S DATA IN AN INPUT RECORD OR RESOURCE IS INVALID: STRUCTURED FIELD *structuredfield* CONTAINED AN EXTENDED RESOURCE LOCAL IDENTIFIER VALUE THAT WAS USED IN A PREVIOUS STRUCTURED FIELD OF THE SAME TYPE.**

**Explanation**

More than one structured field used the same Extended Resource Local Identifier value for different resources of the same type. The Extended Resource Local Identifier is specified by using the Extended Resource Local Identifier (X'22') triplet on the structured field. The structured field that attempted to use the same Extended Resource Local Identifier value is identified in the message.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2004S DATA IN A FORMDEF RESOURCE IS INVALID: MEDIA TYPE LOCAL IDENTIFIER IN MMC STRUCTURED FIELD, ID *identifier* WAS NOT FOUND IN THE STRUCTURED FIELD.**

### Explanation

The Media Type local ID in the Medium Modification Control (MMC) structured field was not present in the Map Media Type (MMT) structured field. The MMC and MMT structured fields are in the form definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK2005S DATA IN AN INPUT RECORD OR PAGEDEF RESOURCE IS NOT VALID: RECORD IDENTIFIER *identifier* COULD NOT BE FOUND WITHIN THE RCD STRUCTURED FIELDS.**

### Explanation

The record identifier that is specified in an input record cannot be matched to a Record Descriptor (RCD) structured field in the current data map. The RCD structured field is in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2007S DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE FIELD RCD POINTER VALUE IN RCD STRUCTURED FIELD NUMBER *number* WILL CAUSE AN INFINITE LOOP.**

### Explanation

The FIELD RECORD DESCRIPTOR POINTER parameter in the Record Descriptor (RCD) structured field that is identified in this message caused an infinite-loop condition. The RCD structured field is contained in the page definition.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2008I DATA IN A PAGEDEF RESOURCE IS NOT VALID: RCD OR XMD STRUCTURED FIELD NUMBER *number* SPECIFIES A VALUE THAT IS NOT VALID AS A POINTER TO A FIELD RCD OR XMD. THE VALUE *rcdvalue* EXCEEDS THE LNC STRUCTURED FIELD COUNT VALUE OF *lncvalue*.**

**Explanation**

The Record Descriptor (RCD) or XML Descriptor (XMD) structured field that is identified in this message specifies a value as a pointer to a Field RCD or XMD. The value that is specified is not valid. The value is greater than the COUNT value in the Line Descriptor Count (LNC) structured field in the current data map. The LNC, RCD, and XMD structured fields are in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2010S RECORD FORMATTING WAS REQUESTED BY THE PAGE DEFINITION BUT THAT FUNCTION IS NOT SUPPORTED BY THIS RELEASE OF ACIF.**

**Explanation**

The record formatting function is not supported by this release of ACIF.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

Select a page definition that does not use the record formatting function.

**User response**

To use the record formatting function, submit this job to a version of ACIF that supports record formatting.

**APK2011I DATA IN A PAGEDEF RESOURCE IS NOT VALID: DATA MAP *datamap1* AND DATA MAP *datamap2* ARE FOR PROCESSING DIFFERENT TYPES OF DATA. ALL DATA MAPS IN THE PAGE DEFINITION MUST SPECIFY THE SAME DATA FORMATTING.**

**Explanation**

A page definition can be used for only one type of data. A single page definition cannot be used to mix the processing of traditional line data, record-format line data, and XML data.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2012S DATA IN A PAGEDEF RESOURCE IS NOT VALID: A NON-ZERO RECORD IDENTIFIER PARAMETER VALUE *value* WAS SPECIFIED IN RCD STRUCTURED FIELD NUMBER *number*.**

**Explanation**

For Record Descriptor (RCD) structured fields that are marked as either a field or a conditional processing RCD, the RECORD IDENTIFIER parameter value must be all zeros. The RCD structured fields are in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2013S DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE SAME RECORD IDENTIFIER *identifier* WAS SPECIFIED IN RCD STRUCTURED FIELD NUMBERS *number1* AND *number2*. ALL RECORD IDENTIFIERS MUST BE UNIQUE IN THE SAME DATA MAP.**

**Explanation**

Except for the default Page Header Record Descriptor (RCD) structured field, the default Page Trailer RCD structured field, Field RCD structured fields, and Conditional Processing RCD structured fields, all other RCD structured fields in a data map must specify a unique record identifier parameter value.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2014I DATA IN AN INPUT RECORD OR PAGEDEF RESOURCE IS NOT VALID: THE PAGE SIZE IS NOT LARGE ENOUGH TO PLACE THE FIRST RECORD OF THE PAGE BY USING RCD OR XMD STRUCTURED FIELD NUMBER *number* AND ITS ASSOCIATED FIELD RCD OR XMD STRUCTURED FIELDS.**

**Explanation**

The Body Record Descriptor (RCD) or XML Descriptor (XMD) structured field that is selected for placing the first body record of the page does not fit within the area of the page that is defined by the bottom margin. If Field RCD or XMD structured fields are being used, one of the Field RCD or XMD structured fields might be positioning data beyond the bottom margin. This error prevents PSF from being able to place the record and continuing.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2015S** **DATA IN A PAGEDEF RESOURCE IS NOT VALID: AN RCD STRUCTURED FIELD SPECIFIED A GRAPHICS DESCRIPTOR TRIPLET TO END ALL STARTED GRAPHICS DESCRIPTOR TRIPLETS THAT HAVE A MATCHING GRAPHIC PARAMETER VALUE *value*, BUT A MATCH COULD NOT BE FOUND.**

**Explanation**

A graphics object can be started by one Record Descriptor (RCD) structured field and ended with another RCD structured field. When this is done, the Graphics Descriptor triplets that start and end a graphics object must have matching GRAPHID parameter values specified and the RCD structured fields must have matching orientations. ACIF cannot find a match between the start and end Graphics Descriptor triplets by using the GRAPHID parameter from the end Graphics Descriptor triplet and the TEXT ORIENTATION parameter value from the RCD structured field.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2016S** **DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE USE RECORD IDENTIFIER FLAG WAS SET BUT THE SUM OF THE DATA START POSITION AND THE DATA LENGTH PARAMETER VALUES IN RCD STRUCTURED FIELD NUMBER *number* SELECTS DATA BEYOND THE RECORD IDENTIFIER FIELD.**

**Explanation**

For Record Descriptor (RCD) structured fields that are marked to use only the record identifier portion of an input record, only the record identifier can be accessed by the RCD. The DATA START parameter plus the DATA LENGTH parameter of this RCD accesses data beyond the 10-byte record identifier area of the input record.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference

for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2017S** **DATA IN A PAGEDEF RESOURCE IS NOT VALID: A FONT IS NEEDED FOR THE *structuredfield* STRUCTURED FIELD IN DATA MAP *datamap* BUT NO FONTS WERE MAPPED IN THE DATA MAP.**

**Explanation**

Fonts that are needed for printing record-format line data or XML data must be selected in the data map. The CHARS JCL parameter cannot be used to select fonts. The data map identified in this message contained a Record Descriptor (RCD) or an XML Descriptor (XMD) structured field that requires a font, but no fonts were specified in the data map.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2018S** **DATA IN A PAGEDEF RESOURCE IS NOT VALID: RCD STRUCTURED FIELD *structuredfield* REQUESTED THAT THE PAGE NUMBER BE RESET, BUT THE PAGE NUMBER PARAMETER CONTAINS ZERO.**

**Explanation**

The PAGE NUMBER parameter in a Record Descriptor (RCD) structured field cannot be zero when the RCD requests that ACIF reset the page number.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2019I** **ADATA IN A PAGEDEF RESOURCE IS NOT VALID: THE FONT SELECTED FOR PRINTING THE PAGE NUMBER ON RCD OR XMD STRUCTURED FIELD NUMBER *number* CANNOT BE A DOUBLE-BYTE FONT WHEN USING THE ASCII ENCODING SCHEME.**

**Explanation**

ACIF cannot determine the correct code points to generate when a double-byte font is used to print the page number by using the ASCII encoding scheme. The structured field that is identified in this message selected a double-byte ASCII font for printing the page number. This is not allowed.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2020I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE OBJECT OID SPECIFIED IN A FULLY QUALIFIED NAME TRIPLET ON AN *structuredfield* STRUCTURED FIELD IS INCORRECT.**

**Explanation**

An object OID being specified in a Fully Qualified Name triplet must not contain all zeros and must be less than 130 bytes.

**System action**

ACIF stops processing the input file and issues a message that identifies the position of the structured field in the file or resource.

**System programmer response**

If a licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid.

**User response**

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2021I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE *structuredfield* STRUCTURED FIELD CONTAINS UNPAIRED FQN X'BE' AND FQN X'DE' TRIPLETS.**

**Explanation**

If this is an Include Object (IOB) or Preprocess Presentation Object (PPO) structured field, the Fully Qualified Name (FQN) triplet with an FQNType of Data Object Internal Resource Reference (X'BE') must immediately follow an FQN triplet with an FQNType of Data Object External Resource Reference (X'DE'). If this is a Map Data Resource (MDR) structured field, a repeating group with an FQN triplet type X'BE' must also include an FQN triplet type X'DE'.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK2022I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A SECONDARY RESOURCE IDENTIFIED ON STRUCTURED**

**FIELD *structuredfield* IS NOT NAMED IN THE ACTIVE ENVIRONMENT GROUP.**

**Explanation**

An Include Object (IOB), Line Descriptor (LND), Record Descriptor (RCD), or XML Descriptor (XMD) structured field calls for a secondary resource. This secondary resource must be named in a Map Data Resource (MDR) in the Active Environment Group (AEG) of the page, overlay, or data map containing the structured field. A color management resource (CMR) is a secondary resource that must be mapped in the AEG. If the CMR name is mapped but the scope or processing mode on the MDR does not match the IOB, LND, RCD, or XMD structured field, this message is issued.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If the error involves separator pages or the message data set, use the information that is provided in the User Response section to correct the error. If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields, contact your system programmer.

**APK2023I** **DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE FORMAT SPECIFIED IN AN FQN TRIPLET IS NOT VALID. The STRUCTURED FIELD *structuredfield* is in error.**

**Explanation**

The FQNFmt specified in a Fully Qualified Name (FQN) triplet on the structured field that is specified in the message is not valid.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields, contact your system programmer.

**APK2024I** **DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A FULLY QUALIFIED NAME TRIPLET MAPPED AN OBJECT THAT IS NOT ALLOWED IN AN MDR STRUCTURED FIELD IN AN OBJECT ENVIRONMENT GROUP.**

**Explanation**

A Fully Qualified Name (FQN) triplet with an FQNType of Begin Resource Object Reference (X'84') or Other Object Data Reference (X'CE') is not allowed on a Map Data Resource (MDR) structured field in an Object Environment Group (OEG).

In addition, an FQN triplet with an FQNType of Data Object External Resource Reference (X'DE') can map only a data object font or a color management resource (CMR) in a bar code object, a graphics object, or a presentation text object with OEG.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2025I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: AN ERROR WAS FOUND IN A FULLY QUALIFIED NAME TRIPLET SPECIFIED IN A REPEATING GROUP ON AN *structuredfield* STRUCTURED FIELD.**

### Explanation

One of these errors was found:

- More than one Fully Qualified Name (FQN) triplet with one of these FQNTypes was found in a repeating group on a Map Data Resource (MDR) structured field:
  - Begin Resource Object Reference (X'84')
  - Other Object Data Reference (X'CE')
  - Data Object External Resource Reference (X'DE')
  - Code Page Name Reference (X'85')
- More than one FQN triplet with one of these FQNTypes was found in a repeating group on a Preprocess Presentation Object (PPO) structured field:
  - Begin Resource Object Reference (X'84')
  - Other Object Data Reference (X'CE')
- An FQNType that is not valid was specified on an FQN triplet on an MDR.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2026I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE OBJECT CLASS SPECIFIED IN AN OBJECT CLASSIFICATION TRIPLET ON AN MDR STRUCTURED FIELD IS NOT VALID.**

### Explanation

The ObjClass specified in an Object Classification triplet on a Map Data Resource (MDR) structured field must be X'40' or X'41' if the Fully Qualified Name (FQN) triplet type in the repeating group is a Data Object External Resource Reference (X'DE'). The ObjClass specified must be X'01' if the FQN triplet type in the repeating group is an Other Object Data Reference (X'CE').

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content*

*Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2027I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: AN MDR STRUCTURED FIELD SPECIFIES THE SAME RESOURCE REFERENCE MORE THAN ONCE IN AN ENVIRONMENT GROUP.**

**Explanation**

The same resource reference cannot be made in a Map Data Resource (MDR) structured field in an environment group.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2029I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: OBJECT OID *objectoid1* DOES NOT MATCH THE OBJECT OID *objectoid2* SPECIFIED ON THE *structuredfield* STRUCTURED FIELD.**

**Explanation**

The object OID specified on a structured field must match the object OID specified on the Map Data Resource (MDR) or Include Object (IOB) structured field that referenced it. A value of *** indicates that an OID was not specified.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2030I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A SECONDARY RESOURCE THAT IS NOT A CMR IS SPECIFIED ON AN IOB STRUCTURED FIELD THAT INCLUDES A BAR CODE, GRAPHICS, OR PRESENTATION TEXT WITH OEG OBJECT.**

**Explanation**

A Fully Qualified Name (FQN) triplet of type Data Object External Resource Reference (X'DE') is specified in an Include Object (IOB) structured field that has a bar code, graphics, or presentation text with OEG object. Only color management resources (CMRs) are allowed as secondary resources for these objects.

**System action**

The secondary resource reference that is not a CMR is ignored and processing continues.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis

reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2033I THE BAR CODE DATA OR BAR CODE DATA PLUS THE ADDITIONAL 2D BAR CODE PARAMETERS EXCEED THE OUTPUT COMMAND BUFFER.**

**Explanation**

Either the bar code data itself or the bar code data plus the macro control block data that is specified for a 2D bar code exceeds the size of the output command buffer. The macro control block data is specified in your page definition as part of the BCXPARMS (additional bar code parameters).

**System action**

ACIF issues this message and continues processing.

**System programmer response**

None.

**User response**

Change the amount of data that is specified for your bar code or reduce the amount of data in the macro control block.

**APK2034S DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE *stucturedfield* STRUCTURED FIELD HAS TOO MANY *identifier* TRIPLETS.**

**Explanation**

The triplet that is specified in the message was found multiple times in the indicated structured field. However, this triplet can occur only once.

**System action**

ACIF stops processing the print data set and issues a message that identifies the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK2035S DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE INTERCHANGE SET IDENTIFIER *identifier* IN THE INTERCHANGE SET X'18' TRIPLET ON A *structuredfield* STRUCTURED FIELD IS NOT VALID.**

**Explanation**

The interchange set identifier in X'18' triplet is not valid.

**System action**

ACIF stops processing the print data set and issues a message that identifies the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or the resource, correct the error and resubmit the print request. See *Mixed Object Document Content*

*Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or the resource, contact your system programmer.

**APK2039I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A DUPLICATE FINISHING OPERATION WAS FOUND IN THE *mapname* MEDIUM MAP.**

**Explanation**

The same finishing operation was specified more than once in a medium map. This nesting of the same finishing operation is not allowed. The Media Finishing Control (MFC) structured field is in a form definition or an internal medium map in the print data set.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

None.

**User response**

If you created the structured fields for the form definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK2040I THE NUMBER OF MEDIA COLLECTION FINISHING NESTING LEVELS IS MORE THAN 4.**

**Explanation**

A maximum of four levels of nesting is allowed for media collection finishing. The Medium Finishing Control (MFC) structured field can be contained in a form definition or internal medium map in a page.

**System action**

ACIF stops processing the data set.

**System programmer response**

None.

**User response**

If you created the form definition or internal medium map, you must remove one or more levels of media collection finishing operations. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. Resubmit the print request. If the total number of nesting levels is less than or equal to four, the error might be an ACIF logic error.

**APK2041I DATA IN AN INPUT RECORD OR PAGEDEF IS NOT VALID: INPUT DATA BEING USED FOR A VARIABLE RESOURCE NAME IN LND OR RCD STRUCTURED *number* IS DOUBLE BYTE DATA.**

**Explanation**

A Resource Object Include triplet or an Extended Resource Local ID triplet on a Line Descriptor (LND) or Record Descriptor (RCD) structured field requests that the input data for the resource name is included. This input data cannot be double-byte data.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* and *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2042I DATA IN A PAGEDEF RESOURCE IS NOT VALID: AN XML PAGE**

**DEFINITION REQUESTED THAT THE INPUT DATA BE USED FOR A RESOURCE NAME ON XMD STRUCTURED FIELD NUMBER *number*.**

**Explanation**

An Object Reference Qualifier (ORQ) triplet is specified on an XML Descriptor (XMD) structured field. This function is not supported when an XML page definition is used.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the resource, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* and *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the resource, contact your system programmer.

**APK2044I DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE FIELD XMD POINTER VALUE IN XMD STRUCTURED FIELD NUMBER *number* WILL CAUSE AN INFINITE LOOP.**

**Explanation**

The Field XML Descriptor Pointer value in the XML Descriptor (XMD) structured field that is identified in this message caused an infinite loop condition. The XMD structured field is contained in the page definition.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* and *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2045I THE ENCODING SCHEME SPECIFIED IN A PAGE DEFINITION USED TO PROCESS XML DATA IS NOT SUPPORTED BY ACIF.**

**Explanation**

The encoding scheme that is specified is not supported by ACIF.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

You must use an encoding scheme that is supported by ACIF for XML data processing. See *Advanced Function Presentation: Programming Guide and Line Data Reference* and *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2046I XML DATA FORMATTING WAS REQUESTED BY THE PAGE DEFINITION BUT THAT FUNCTION IS NOT SUPPORTED BY THIS RELEASE OF ACIF.**

**Explanation**

The XML data formatting function is not supported by this release of ACIF.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

None.

**User response**

To use the XML data formatting function, submit this job to a version of ACIF that supports XML data formatting.

**APK2047I DATA IN A PAGEDEF RESOURCE IS NOT VALID: DATA MAP *datamapname1* AND DATA MAP *datamapname2* HAVE DIFFERENT ENCODING SCHEMES SPECIFIED FOR THE USER DATA. ALL DATA MAPS IN THE PAGE DEFINITION MUST SPECIFY THE SAME ENCODING SCHEME.**

**Explanation**

All the data maps in a page definition that is used to process XML data must use the same encoding scheme for the user data.

**System action**

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* and *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2048I DATA IN AN INPUT RECORD IS NOT VALID: A DTD DECLARATION AT CHARACTER COUNT NUMBER *number* IS SPECIFIED OUTSIDE OF A DTD.**

**Explanation**

A document type definition (DTD) declaration is only allowed inside a DTD. The character count number that is specified in this message is relative to the start of the record.

**System action**

ACIF stops processing the current data set and issues a message that identifies the position of the error in the data stream.

**System programmer response**

If an IBM licensed program was used to create the XML data with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the XML data, correct the error and resubmit the print request. See the XML specification, Extensible Markup Language (XML) 1.0, on the World Wide Web Consortium website. If the XML data does not have an error, the error might be an ACIF logic error. If you used a program to create the XML data, contact your system programmer.

**APK2049I DATA IN AN INPUT RECORD IS NOT VALID: THE XML COMMENT SYNTAX AT CHARACTER COUNT NUMBER *number* IS NOT VALID.**

**Explanation**

After an XML comment is started, you can use only two dashes in a row when you are ending a comment. The character count number that is specified in the message is relative to the start of the record.

**System action**

ACIF stops processing the current data set and issues a message that identifies the position of the error in the data stream.

**System programmer response**

If an IBM licensed program was used to create the XML data with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the XML data, correct the error and resubmit the print request. See the XML specification, Extensible Markup Language (XML) 1.0, on the World Wide Web Consortium website. If the XML data does not have an error, the error might be an ACIF logic error. If you used a program to create the XML data, contact your system programmer.

**APK2050I** **DATA IN AN INPUT RECORD IS NOT VALID: THE XML END TAG AT CHARACTER COUNT NUMBER *number* DOES NOT MATCH THE LAST START TAG.**

**Explanation**

An XML end tag must exactly match its start tag. The character count number that is specified in this message is relative to the start of the record.

**System action**

ACIF stops processing the current data set and issues a message that identifies the position of the error in the data stream.

**System programmer response**

If an IBM licensed program was used to create the XML data with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the XML data, correct the error and resubmit the print request. See the XML specification, Extensible Markup Language (XML) 1.0, on the World Wide Web Consortium website. If the XML data does not have an error, the error might be an ACIF logic error. If you used a program to create the XML data, contact your system programmer.

**APK2051I** **DATA IN AN INPUT RECORD IS NOT VALID: THE END OF A DOCUMENT TYPE DECLARATION AT CHARACTER COUNT NUMBER *number* IS NOT THE CORRECT SYNTAX.**

**Explanation**

The end of a document type declaration (DTD) did not have the correct syntax. The character count number that is specified in this message is relative to the start of the record.

**System action**

ACIF stops processing the current data set and issues a message that identifies the position of the error in the data stream.

**System programmer response**

If an IBM licensed program was used to create the XML data with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the XML data, correct the error and resubmit the print request. See the XML specification, Extensible Markup Language (XML) 1.0, on the World Wide Web Consortium website. If the XML data does not have an error, the error might be an ACIF logic error. If you used a program to create the XML data, contact your system programmer.

**APK2052I** **DATA IN AN INPUT RECORD IS NOT VALID: THE CHARACTER CODE AT CHARACTER COUNT NUMBER *number* IS NOT A VALID VALUE FOR A CHARACTER REFERENCE.**

**Explanation**

A character code inside a character reference is not one of the allowed values. The character count number that is specified in this message is relative to the start of the record.

**System action**

ACIF stops processing the current data set and issues a message that identifies the position of the error in the data stream.

### System programmer response

If an IBM licensed program was used to create the XML data with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the XML data, correct the error and resubmit the print request. See the XML specification, Extensible Markup Language (XML) 1.0, on the World Wide Web Consortium website. If the XML data does not have an error, the error might be an ACIF logic error. If you used a program to create the XML data, contact your system programmer.

**APK2053I DATA IN AN INPUT RECORD IS NOT VALID: THE ENTITY AT CHARACTER COUNT NUMBER *number* IS NOT DEFINED IN THE DOCUMENT TYPE DEFINITION.**

### Explanation

ACIF allows only internal general entity references, which must be defined in an internal document type definition (DTD). The character count number that is specified in this message is relative to the start of the record.

### System action

ACIF stops processing the current data set and issues a message that identifies the position of the error in the data stream.

### System programmer response

If an IBM licensed program was used to create the XML data with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the XML data, correct the error and resubmit the print request. See the XML specification, Extensible Markup Language (XML) 1.0, on the World Wide Web Consortium website. If the XML data does not have an error, the error might be an ACIF logic error. If you used a program to create the XML data, contact your system programmer.

**APK2054I DATA IN AN INPUT RECORD IS NOT VALID: THE CHARACTER IN A TAG NAME AT CHARACTER COUNT NUMBER *number* IS NOT VALID.**

### Explanation

A character in an XML tag name is not valid. The character count number that is specified in this message is relative to the start of the record.

### System action

ACIF stops processing the current data set and issues a message that identifies the position of the error in the data stream.

### System programmer response

If an IBM licensed program was used to create the XML data with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the XML data, correct the error and resubmit the print request. See the XML specification, Extensible Markup Language (XML) 1.0, on the World Wide Web Consortium website. If the XML data does not have an error, the error might be an ACIF logic error. If you used a program to create the XML data, contact your system programmer.

**APK2055I DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE ENCODING SCHEME IDENTIFIER FOR THE USER DATA IS NOT SPECIFIED IN THE ENCODING SCHEME TRIPLET ON THE BDM STRUCTURED FIELD.**

### Explanation

The Encoding Scheme Identifier for User Data (ESidUD) is missing on the Encoding Scheme triplet (X'50') on a Begin Data Map (BDM) structured field. This information is required when an XML page definition is processed.

### System action

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

You must provide the encoding scheme for the user data. See *Advanced Function Presentation: Programming Guide and Line Data Reference* and *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2056I DATA IN A PAGEDEF RESOURCE IS NOT VALID: THE SAME QUALIFIED TAG WAS SPECIFIED IN XMD STRUCTURED FIELD NUMBERS *number1* AND *number2*. ALL QUALIFIED TAGS MUST BE UNIQUE IN THE SAME DATA MAP.**

**Explanation**

All XML Descriptor (XMD) structured fields in a data map must specify a unique qualified tag, except for these types of XMD structured fields:

- Default Page Header
- Default Page Trailer
- Field
- Conditional Processing
- Attribute

**System action**

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* and *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2057I DATA IN A PAGEDEF RESOURCE IS NOT VALID: RELATIVE INLINE POSITIONING ON AN XMD STRUCTURED FIELD CAN ONLY BE USED TO PLACE TEXT DATA.**

**Explanation**

A Resource Object Include, Extended Resource Local ID, Bar Code Symbol Descriptor, or Graphics Descriptor triplet is specified on an XML Descriptor (XMD) structured field that uses relative inline positioning. You must use absolute inline positioning when you are including a page segment, overlay, or object with an XMD structured field. You must also use absolute inline positioning when you are generating a bar code or graphics object with an XMD structured field.

**System action**

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

You must change your inline positioning to an absolute value. See *Advanced Function Presentation: Programming Guide and Line Data Reference* and *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2072I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: AN INCORRECT COMBINATION OF TRIPLETS WAS SPECIFIED WHEN MAPPING A DATA OBJECT FONT IN AN MDR STRUCTURED FIELD.**

**Explanation**

When you are mapping a data object font (DOF) in a Map Data Resource (MDR) structured field, you must specify Fully Qualified Name (FQN) type X'DE', FQN type X'BE', and DOF Descriptor X'8B' triplets. In addition, the FQN type X'BE' triplet must specify a 1-byte local ID.

**System action**

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* and *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field has no error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2073I DATA IN AN INPUT RECORD IS NOT VALID: THE FULLY QUALIFIED TRIPLET TYPE AND THE OBJECT TYPE SPECIFIED IN A REPEATING GROUP ON A PREPROCESS PRESENTATION OBJECT STRUCTURED FIELD DO NOT AGREE.**

**Explanation**

When a repeating group in a Preprocess Presentation Object (PPO) structured field is mapping an object container, you must use a Fully Qualified Name (FQN) triplet of type X'CE'. When the repeating group is mapping an IOCA object or overlay, you must use an FQN triplet of type X'84'.

**System action**

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. It is possible that the problem is the object type OID specified in the X'10' Object Classification triplet. It might specify that a TrueType or OpenType collection is being mapped when a font is really mapped. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2074I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: AN MDR STRUCTURED FIELD IS MAPPING THE NAME OF A TRUETYPE OR OPENTYPE COLLECTION.**

**Explanation**

When you are mapping a data object font (DOF), you can specify only the name of a TrueType or OpenType font. This font might be in a collection, but the Map Data Resource (MDR) structured field needs the font name in the collection.

**System action**

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. It is possible that the problem is the object type OID specified in the X'10' Object Classification triplet. It might specify that a TrueType or OpenType collection is being mapped when a font is really mapped. See *Mixed Object Document Content*

*Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2075S** **TRCS ARE NOT ALLOWED WITH A PAGE THAT HAS FONTS MAPPED IN BOTH AN MCF AND AN MDR. THE DATA MAP BEING PROCESSED IS *datamap*.**

### Explanation

You can use table reference characters (TRCs) with fonts that are mapped in a Map Coded Font (MCF) structured field (FOCA fonts) or a Map Data Resource (MDR) structured field (TrueType and OpenType fonts). However, you cannot have a mixture of both types of fonts in a data map and use TRCs.

### System action

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

### System programmer response

If the error involves separator pages or the message data set, use the information that is provided in the User Response section to correct the error.

### User response

Change your page definition to use either all FOCA fonts (mapped in an MCF) or all TrueType or OpenType fonts (mapped in an MDR).

**APK2076I** **PAGE BASED SOSI PROCESSING HAS BEEN REQUESTED BUT A SINGLE BYTE FONT WITH A FONT ID OF 1 AND A DOUBLE BYTE FONT WITH A FONT ID OF 2 HAVE NOT BEEN MAPPED. THE DATA MAP BEING PROCESSED IS *datamap*.**

### Explanation

When you are doing page-based SOSI processing, you are switching back and forth between the same two fonts. As a result, two fonts must be mapped by using font IDs 1 and 2.

### System action

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

### System programmer response

If the error involves separator pages or the message data set, use the information that is provided in the User Response section to correct the error.

### User response

Change your page definition to map a single-byte font with font ID 1 and a double byte font with font ID 2. See the documentation for the application that you use to generate page definitions for information about how to map fonts to specific font IDs.

**APK2077I** **DATA IN AN INPUT RECORD IS NOT VALID: AN INLINE TRUETYPE OR OPENTYPE COLLECTION DOES NOT HAVE ANY BASE FONTS SPECIFIED.**

### Explanation

The Begin Resource (BRS) structured field must have Fully Qualified Name triplet of type X'6E' for each base font that is contained in the collection.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2078I DATA IN AN INPUT RECORD IS NOT VALID: AN INLINE RESOURCE HAS AN INCORRECT SPECIFICATION OF BASE FONTS, LINKED FONTS, OR MAPPED CMRS.**

### Explanation

A Begin Resource (BRS or BR) structured field has an error. Base fonts (Fully Qualified Name triplets of type X'6E') can only be specified for TrueType or OpenType collections. Linked fonts (Fully Qualified Name triplets of type X'7E') can only be specified for a TrueType or OpenType font or for a base font of a TrueType or OpenType collection. Mapped CMRs (Fully Qualified Name triplets of type X'41') can only be specified for color management resources (CMRs).

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields for the print data set, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2079I THE INFORMATION NEEDED TO DESCRIBE A TRUETYPE OR OPENTYPE FONT OR COLLECTION *name* EXCEEDS THE BEGIN OBJECT CONTAINER STRUCTURED FIELD.**

### Explanation

The number of names and linked fonts for a TrueType or OpenType font or the number of base fonts and linked fonts for a TrueType or OpenType collection exceeds the Begin Object Container structured field.

### System action

ACIF stops processing the object container.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

You cannot collect this TrueType or OpenType font or font collection.

**APK2080I INPUT DATA *inputdata* CANNOT BE CONVERTED TO AN ENCODING OF *ccsid*. RETURN CODE *returncode* AND REASON CODE *reasoncode* VALUES WERE RETURNED BY THE CONVERTER.**

### Explanation

ACIF must convert the input data to the specified encoding to continue processing. An error occurred during this conversion. If the input data is a resource name, the CCSID indicates that mixed single-byte or double-byte EBCDIC data is being converted to mixed single-byte or double-byte ASCII data for a Quick Response (QR) Code bar code. If the error occurs on data for a bar code, only the first 50 bytes of the data are shown in the message. The return codes and reason codes are returned by the system's conversion services (ICONV). See the system documentation for these conversion services for more information about the errors.

### System action

ACIF stops processing the input file and issues a message that identifies the position of the structured field in the file or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

Correct the error as described by the system documentation for the conversion service.

**APK2082I DATA IN AN INPUT RECORD IS NOT VALID. RESOURCE *resourcename* IS SPECIFIED ON A PREPROCESS PRESENTATION OBJECT (PPO) STRUCTURED FIELD BUT IS NOT MAPPED IN THE RESOURCE ENVIRONMENT GROUP.**

### Explanation

All resources that are specified on a PPO structured field must be mapped in the Resource Environment Group (REG). Overlays must be mapped with a Map Page Overlay (MPO) structured field. IOCA image and object containers must be mapped with a Map Data Resource (MDR) structured field.

### System action

ACIF stops processing the input file and issues a message that identifies the position of the structured field in the file or resource.

### System programmer response

If a licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid.

### User response

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2083I DATA IN A PAGEDEF RESOURCE IS NOT VALID: DATA MAP *data map name* HAS RECORD FORMAT IDS THAT ARE NOT THE SAME LENGTH.**

### Explanation

All the record format IDs for a data map in a page definition must be the same length. Blanks can be used in the record format ID to make it the required length.

### System action

ACIF stops processing the current data set and issues additional messages that identify the processing environment when the error was found.

### System programmer response

If a licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your systems's diagnosis reference for assistance in determining the source of the problem. If the error involves separator pages or the message data set, use the information in the User Response section to correct the error.

### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Advanced Function Presentation: Programming Guide and Line Data Reference* for more information about the structured field. If the structured field is correct, the error might be an ACIF or printer logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2084I DATA IN AN INPUT RECORD IS NOT VALID: THE LENGTH OF DATA IN RECORD NUMBER *record number* DOES NOT MATCH THE LENGTH REQUIRED FOR THE USER DATA TYPE SPECIFIED IN THE PAGE DEFINITION.**

### Explanation

The possible causes of this error depend on the type of user data that is specified in the page definition:

- If you specified UTF16 data, the record length must be a multiple of 2.
- If you specified UTF8 data, the length of each character can vary 1 - 4 bytes.

### System action

ACIF stops processing the current data set and issues a message that identifies the position of the error in the input data stream. ACIF issues additional messages that identify the processing environment when the error was found.

### System programmer response

If a licensed program was used to create the data with the error, verify that the input to that program is valid.

### User response

If you created the data, correct the data in the record to match the specified data type, and resubmit the print request. If the data has no error, the error might be an ACIF logic error. If you used a program to create the data, contact your system programmer.

**APK2088I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: STRUCTURED FIELD *structuredfield* HAS AN INCORRECT SCOPE VALUE ON A CMR DESCRIPTOR TRIPLET.**

### Explanation

The scope value is not correct on the Color Management Resource (CMR) Descriptor triplet, X'91', for the specified structured field.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields, contact your system programmer.

**APK2089I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE *structuredfield* STRUCTURED FIELD CONTAINS UNPAIRED FQN X'DE' AND CMR DESCRIPTOR TRIPLETS.**

### Explanation

When you are specifying a color management resource (CMR), the CMR Descriptor triplet (X'91') must immediately follow a Fully Qualified Name (FQN) triplet with an FQNType of Data Object External Resource Reference (X'DE').

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the file or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields, contact your system programmer.

**APK2090I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: STRUCTURED FIELD *structuredfield* HAS AN INCORRECT PROCESSING MODE VALUE ON A CMR DESCRIPTOR TRIPLET.**

### Explanation

The processing mode value is not correct on the Color Management Resource (CMR) Descriptor triplet, X'91', for the specified structured field. Only audit, instruction, or device link CMR modes are valid.

### System action

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the file or resource.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields, contact your system programmer.

**APK2093I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A REPEATING GROUP IN AN MDR STRUCTURED FIELD CONTAINS AN INCOMPLETE SPECIFICATION FOR A CMR.**

**Explanation**

A repeating group in a Map Data Resource (MDR) structured field for a color management resource (CMR) is missing a Fully Qualified Name (FQN) triplet (X'02') with an FQNType of Data Object External Resource Reference (X'DE'), a CMR Descriptor triplet (X'91'), or both.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the file or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields, contact your system programmer.

**APK2096I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A COLOR MANAGEMENT RESOURCE (CMR) NAME HAS AN ERROR.**

**Explanation**

A problem exists with the name of a color management resource (CMR) that is specified in a Map Data Resource (MDR) or a Begin Resource (BRS or BR) structured field. The possible problems are:

- A link (LK) CMR cannot be specified in an MDR.
- A generic CMR must have a type of tone transfer curve (TTC) or halftone (HT).
- A pass-through CMR must have a type of color conversion (CC).
- The CMR name length must be 73 bytes in single-byte encoding or 146 bytes in double-byte encoding.
- A device link (DL) CMR is device-specific and cannot be generic.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the file or resource.

**System programmer response**

If a licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields, contact your system programmer.

**APK2102S DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: STRUCTURED FIELD *structuredfield* HAS AN INCORRECT OBJECT TYPE IN AN OBJECT OFFSET TRIPLET.**

**Explanation**

The object type in an Object Offset triplet (X'5A') is not correct. The object type must be "document" if the selected object is a document type object and "page" if the selected object is a page or paginated object.

### System action

ACIF stops processing the print job.

### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

**APK2103I** **DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE *structuredfield* STRUCTURED FIELD IN A PAGE DEFINITION IS MISSING A CMR DESCRIPTOR TRIPLET.**

### Explanation

When you are specifying a color management resource (CMR), a CMR Descriptor triplet (X'91') must immediately follow a Fully Qualified Name (FQN) triplet with an FQNType of Data Object External Resource Reference (X'DE').

### System action

ACIF stops processing the data set.

### System programmer response

If an IBM licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK2104I** **TOO MANY CMRs HAVE BEEN SPECIFIED.**

### Explanation

One of these conditions occurred:

- Too many color management resources (CMRs) were specified in the data object resource access table (RAT) to fit on the Include Object (IOB) command or the Preprocess Presentation Object (PPO) command.
- Too many CMRs were specified on a Begin Image (BIM) or Begin Object Container (BOC) structured field to write the OID from the data object RAT on the BIM or BOC.

### System action

ACIF stops processing the data set.

### System programmer response

If an IBM licensed program was used to create the structured fields for the print data set or the resource with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

### User response

You must specify thousands of CMRs to create this condition. Contact the generator of your data stream to remove the extraneous CMRs.

**APK2105W** **THE DATA STREAM IS MISSING STRUCTURED FIELD *structuredfield*.**

### Explanation

A Begin Named Group (BNG) structured field must have a matching End Named Group (ENG) structured field. However, an ENG structured field was not found for at least one BNG. Therefore, the indexing that is created for the data set might not be valid.

### System action

ACIF builds the output document and index files as requested, but the output might not be what the user expects.

### System programmer response

If an IBM licensed program was used to create the data stream with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

Check the input data stream to ensure that each BNG structured field has a matching ENG structured field. If it does not meet this requirement, add the missing ENG structured fields.

### APK2108I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: A RESOURCE OTHER THAN A CMR HAS BEEN SPECIFIED IN AN MDR STRUCTURED FIELD FOR A FORM DEFINITION.

#### Explanation

Only color management resources (CMRs) can be specified in a Map Data Resource (MDR) structured field for a form definition.

#### System action

ACIF stops processing the print job.

#### System programmer response

If an IBM licensed program was used to create the structured fields for the form definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

If you created the structured fields, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the form definition, contact your system programmer.

### APK2116S DATA IN A PAGEDEF RESOURCE IS NOT VALID. CONFLICTING SEQUENCE NUMBER TYPES HAVE BEEN SPECIFIED FOR A CONCATENATED BAR CODE ON A *structuredfield* STRUCTURED FIELD.

#### Explanation

All segments of a given concatenated bar code must specify the same type of sequence numbering. All segments must specify either sequence numbers or no sequence numbers. Concatenated bar code sequence numbers are part of the Concatenate Bar Code Data triplet (X'93'), which is specified on a Line Descriptor (LND), Record Descriptor (RCD), or XML Descriptor (XMD) structured field in the page definition.

#### System action

ACIF stops processing the print job.

#### System programmer response

If a licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

#### User response

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

### APK2120I DATA IN AN INPUT RECORD OR RESOURCE IS NOT VALID: THE INITIAL TEXT CONDITIONS IN THE PTD STRUCTURED FIELD ARE INCORRECT.

#### Explanation

The Presentation Text Descriptor (PTD) structured field is in the Object Environment Group (OEG) of a PTOCA object. This object can be in a page, overlay, or a resource.

#### System action

ACIF stops processing the input file and issues another message that identifies the position of the structured field in the data stream or resource.

#### System programmer response

If a licensed program was used to create the structured fields for the object with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the print data set or resource, correct the error and resubmit the print request. See *Presentation Text Object Content Architecture Reference* for more information about the correct format of the referenced structured field. If the structured field is correct, the error might be an ACIF logic error. If you used a program to create the structured fields for the print data set or resource, contact your system programmer.

**APK2121I DATA WAS FOUND AFTER AN END PRINT FILE (EPF) STRUCTURED FIELD WHEN AN END OF FILE (EOF) WAS EXPECTED.**

**Explanation**

When ACIF finds a Begin Print File (BPF) and End Print File (EPF) structured field pair, an End of File (EOF) must immediately follow the EPF. However, ACIF found data other than an EOF after the EPF.

**System action**

ACIF stops processing the print job.

**System programmer response**

If a licensed program was used to create the structured fields for the page definition with the error, verify that the input to that program is valid. If the input is valid, see your system's diagnosis reference for assistance in determining the source of the problem.

**User response**

If you created the structured fields for the page definition, correct the error and resubmit the print request. See *Mixed Object Document Content Architecture Reference* for more information about the structured field. If the structured field does not have an error, the error might be an ACIF logic error. If you used a program to create the structured fields for the page definition, contact your system programmer.

**APK3506I DATA OBJECT RESOURCE TYPE *type*. OBJECT ID *objectid*, COULD NOT BE FOUND IN THE RESOURCE LIBRARY.**

**Explanation**

The registration ID (object-type OID) for the specified data object resource cannot be read from the resource library. Only objects with valid data object resource names or resource locator names are supported by ACIF. The registration ID is specified in the Object Classification triplet on an Include Object (IOB), Begin Object Container (BOC), Begin Resource (BRS or BR), or Map Data Resource (MDR) structured field. If the *objectid* specified in this message is ***, ACIF either does not support the registration ID or does not have enough information to identify the *objectid*.

**System action**

ACIF stops processing the print data set and issues a message that identifies the position of the structured field in the data stream or resource.

**System programmer response**

If an IBM licensed program was used to create the structured fields, verify that the input to that program is valid and the correct printer is being used.

**User response**

Modify the structured field that refers to the object to include a resource locator triplet.

**APK3507I RESIDENT COLOR PROFILE *type*, OBJECT ID *objectid*, COULD NOT BE FOUND IN THE RESOURCE LIBRARY.**

**Explanation**

The resident color profile with object ID (object-type OID) cannot be found because no resource locator name was specified. ACIF cannot access objects by OID name only.

**System action**

ACIF ignores the request for the resident color profile and because the profile is not necessary, continues processing.

**System programmer response**

None.

**User response**

Modify the structured field that refers to the object to include a resource locator triplet.

# Appendix A. Helpful hints for using ACIF

When you are using ACIF, these topics might prove helpful to you:

- Working with control statements that contain numbered lines
- Placing TLEs in named groups to avoid storage problems
- Understanding how ANSI and machine carriage controls are used
- Understanding common methods of transferring files into AIX or Windows from other systems:
  - Physical media such as tape
  - PC file transfer program
  - File Transfer Protocol (FTP)
  - Download for z/OS
  - Other considerations
- Creating Invoke Medium Map (IMM) structured fields
- Indexing considerations
- Using regular expressions
- Concatenating the resource file and the document file
- Processing inline resources
- Specifying the IMAGEOUT parameter
- Creating a MO:DCA-P object container
- Processing Unicode complex text

## Working with control statements that contain numbered lines

Because ACIF reads all columns of the control statements for processing purposes, you sometimes can receive unexpected results when data set names are continued and the control statements have line numbers in the last eight columns. (ACIF attempts to use the line number as a data set name, and issues message APK451S with a numeric value.) To resolve this problem, remove any line numbers from the control statements and rerun the job, or use a comment indicator ("/*") before each line number.

## Placing TLEs in named groups to avoid storage problems

Be aware that if you request INDEXOBJ=ALL for a job that has an input data set that contains composed (MO:DCA-P) pages, page-level TLEs (TLE records after the AEG), and no named groups (BNG/ENG), your job might end with message APK410S or message APK408S.

To avoid having ACIF end your job, IBM suggests that you place page-level Tag Logical Elements (TLEs) inside named groups by using one named group per page. This suggestion is because, when no named groups are present, the page-level TLE records must be collected in memory until the end of the input document or file. MO:DCA-P index structures contain the extent (size) of the object that is being indexed. Indexed objects are delimited by a named group or end document (EDT). If no named groups are present, ACIF continues to build the index in memory. If the input file is too large and the memory is not adequate, ACIF stops. The ACIF memory manager currently limits the number (but not the size) of memory blocks that can be allocated; therefore, increasing REGION size might not alleviate the problem.

## Understanding how ANSI and machine carriage controls are used

In many environments (including IBM mainframes and most minicomputers), printable data normally contains a carriage control character. The carriage control character acts as a vertical tab command to position the paper at the start of a new page, at a specified line on the page, or to control skipping to the next line. The characters can be one of two types: ANSI carriage control or machine carriage control.

- ANSI carriage control characters
  - The most universal carriage control is ANSI, which consists of a single character that is a prefix for the print line. The standard ANSI characters are:

    | ANSI | Command |
    |---|---|
    | **space** | Single space the line and print. |
    | **0** | Double space the line and print. |
    | **-** | Triple space the line and print. |
    | **+** | Do not space the line and print. |
    | **1** | Skip to channel 1 (the top of the form, by convention). |
    | **2–9** | Skip to hardware-defined position on the page. |
    | **A,B,C** | Defined by a vertical tab record or FCB. |

    All ANSI control characters do the required spacing before the line is printed. ANSI controls can be encoded in EBCDIC (CCTYPE=A) or in ASCII (CCTYPE=Z).
- Machine carriage control characters
  - Machine carriage controls were originally the actual hardware control commands for IBM printers and are often used on non-IBM systems. Machine controls are literal values, not symbols. Literal values are not represented as characters in any encoding; therefore, machine controls cannot be translated. Typical machine controls are:

    | Machine | Command |
    |---|---|
    | **X'09'** | Print the line and single space. |
    | **X'11'** | Print the line and double space. |
    | **X'19'** | Print the line and triple space. |
    | **X'01'** | Print the line and do not space. |
    | **X'0B'** | Space one line immediately (do not print). |
    | **X'89'** | Print the line and then skip to channel 1 (top of form, by convention). |
    | **X'8B'** | Skip to channel 1 immediately (do not print). |

Machine controls print before they do any required spacing. Many more machine control commands exist than ANSI. Carriage controls can be present in a print file or not, but every record in the file must contain a carriage control if the controls are to be used. If the file contains carriage controls, but CC=NO is specified to ACIF, the carriage controls are treated as printing characters. If no carriage controls are specified, the file is printed as though it is single-spaced.

## Understanding common methods of transferring files into AIX or Windows from other systems

You can use various methods to transfer files from other systems into AIX or Windows. Each method results in a different set of possible outputs. Some methods produce output that cannot be used by ACIF. These methods are commonly used to transfer files from other systems to AIX or Windows and produce output that ACIF can use:

- Physical media (such as tape)
- PC file transfer program
- File Transfer Program (FTP)
- Download for z/OS

Other considerations for transferring files are also listed in the following information.

### Physical media

Normally, you can copy fixed-length files without any transformation by using a physical media, such as tape. However, for variable-length files, either the creator of the tape or the copy program must include a 2-byte binary length as a prefix to each record.

### PC file transfer program

You can transfer files from other systems to AIX or Windows by using a PC file transfer program, such as `IND$FILE`. You can also transfer files from a host to a personal computer. The variety of possible parameters that can affect printing are host-dependent. IBM suggests that you use these settings:

- For z/OS and VM/CMS files, the default is binary.
- For CICS® and VSE, binary is preferred.
- For files with fixed-length records, binary is preferred (you must know the record length).
- For files with variable-length records that contain only printable characters and either ANSI carriage control characters, or no carriage control characters:
  - Use ASCII and CRLF.
  - Specify `INPEXIT=asciinpe` to remove the otherwise unprintable carriage return (X'0D') that is inserted in the file.
- For VSE files, more file transfer parameters are available.
- For files with machine carriage control, you can specify BINARY, CRLF, and CC. This specification provides an EBCDIC file with correct carriage controls separated by ASCII delimiters and carriage returns.

### FTP

From most systems, FTP works similarly to PC file transfer; most of the same options are provided. Also, when FTP is processed on an AIX or Windows system, you can omit the extraneous carriage return. However, you must test and check your implementation; some FTPs use IMAGE as a synonym for BINARY.

### Download for z/OS

The Download for z/OS feature of PSF for z/OS automatically transmits data from the JES spool to another system in the IBM Internet Protocol network. A print server, such as PSF for z/OS, receives the data sets for printing, or an archive server, such as Content Manager OnDemand, receives the data sets for archiving. Download for z/OS can supply the 2-byte record length prefix for each file that is downloaded from the JES spool.

### Other considerations

Conventional file transfer programs cannot correctly handle the combination of variable-length files, which contain bytes that cannot be translated from their original representation to ASCII, and might also contain machine control characters, mixed line data and structured fields, or special code points that have no standard mapping.[2] Your best solution is to either NFS-mount the file, or write a small filter program on the host system that appends the 2-byte record length to each record and transfer the file binary.

Generally, NFS-mounted files are not translated. However, NFS includes a 2-byte binary record length as a prefix for variable-length records. (Check your NFS implementation; you might have to use special parameters.)

**Note:** Some NFS systems do not supply the binary record length for fixed-length files.

ACIF treats a file that contains only structured fields (MO:DCA-P) as a special case. You can always transfer such a file as binary with no special record separator, and ACIF can always read it because structured fields are self-defining, containing their own length; ACIF handles print files and print resources (form definitions, fonts, page segments, overlays, and other resources) in the same way.

## Creating Invoke Medium Map (IMM) structured fields

To ensure that pages are reprinted (or viewed) by using the correct medium map, retrieval programs must be able to detect which medium map is active. To ensure that the correct medium map is used, use the Active Medium Map triplet and the Medium Map Page Number triplet (from the appropriate Index Element (IEL) structured field in the index object file), which designate the name of the last explicitly called IMM structured field and the number of pages that are produced since the IMM was called. The retrieval system can use this information to dynamically create IMM structured fields at the appropriate locations when it retrieves a group of pages from the archived document file.

If an ACIF input file consists of more than one document (determined by the BDT and EDT structured fields) and INDEXOBJ=BDTLY is not specified, ACIF removes all BDT and EDT structured fields when it processes the file. This action can cause a document to begin with an incorrect medium map. To prevent an incorrect medium map from being used, specify INSERTIMM=YES. ACIF inserts the appropriate IMM before the first page that was indicated by the BDT structured field that ACIF removed.

## Indexing considerations

The index object file contains Index Element (IEL) structured fields that identify the location of the tagged groups in the print file. The tags are contained in the Tag Logical Element (TLE) structured fields.

The structured field offset and byte offset values are accurate at the time ACIF creates the output document file. However, if you extract various pages or page groups for viewing or printing, you must dynamically create from the original a temporary index object file that contains the correct offset information for the new file. For example:

- ACIF processed all the bank statements for six branches by using the account number, statement date, and branch number.

[2] When ASCII is specified, for example, the file transfer program might destroy the data in translation. When binary is specified, the file transfer program might not be able to indicate record lengths.

- The resultant output files were archived with a system that lets these statements be retrieved based on any combination of these three indexing values.

If you wanted to view all the bank statements from Branch 1, your retrieval system must be able to extract all the statements from the print file ACIF created (possibly by using the IELs and TLEs in the index object file) and create another document for viewing. This new document would need its own index object file that contains the correct offset information.

Under some circumstances, the indexing that ACIF produces might not be what you expect, for example:

- If your page definition produces multiple-up output, and if the data values you are using for your indexing attributes appear on more than one of the multiple-up subpages, ACIF might produce two indexing tags for the same physical page of output. In this situation, only the first index attribute name appears as a group name, when you are using AFP Workbench Viewer. To avoid this situation, specify a page definition that formats your data without multiple-up when you submit the indexing job to ACIF.
- If your input file contains machine carriage control characters, and you use the new page carriage control character as a TRIGGER, the indexing tag created points to the page on which the carriage control character was found, not to the new page created by the carriage control character. This situation happens because machine controls write before they process any action; therefore, they are associated with the page or line on which they appear. Using machine carriage control characters for triggers is not a recommended practice.
- If your input file contains application-generated separator pages (for example, banner pages), and you want to use data values for your indexing attributes, you can write an Input Data exit program to remove the separator pages. Otherwise, the presence of those pages in the file makes the input data too unpredictable for ACIF to reliably locate the data values. As alternatives to writing an exit program, you can also change your application program to remove the separator pages from its output, or you can use the INDEXSTARTBY parameter to instruct ACIF to start indexing on the first page after the header pages.
- If you want to use data values for your indexing attributes, but none of the values appear on the first page of each logical document, you can cause ACIF to place an indexing tag on the first page by defining a FIELD parameter with a large enough negative relative record number from the anchor record to "page" backward to the first page. Without referencing this FIELD parameter in an INDEX parameter, the tag that is generated by any INDEX parameter is placed on the first page.
- If your input file contains Unicode data and you specify EXTENSIONS=IDXCPGID to process the code page identifiers, you must ensure that:
  - The CPGID parameter indicates the code page of the document and the extracted index values, which must be in the same code page.
  - The TRIGGER parameter value and INDEX parameter name are expressed in big endian format in the code page that is specified by the CPGID parameter.
  - The FIELD parameter values are extracted from the document in big endian format.
  - The mask field is not specified on the FIELD parameter unless you are using code page 1208 and only indexing single-byte characters. MASK does not support the multiple-byte characters of code page 1208 (UTF-8).

  Figure 29 on page 211 shows the ACIF parameters for a document with a code page of 1200.

```
CC=YES
CCTYPE=A
CPGID=1200
TRIGGER1=*,228,X'0050004100470045',(TYPE=GROUP)   /* P A G E */
FIELD1=0,246,10,(TRIGGER=1,BASE=0)
FIELD2=0,-76,16,(TRIGGER=1,BASE=TRIGGER)
INDEX1=X'0070006100670065',FIELD1,(TYPE=GROUP,BREAK=YES)   /* page */
INDEX2=X'006E0061006D0065',FIELD2,(TYPE=GROUP,BREAK=YES)  /* name */
EXTENSIONS=IDXCPGID
FORMDEF=F1IBMTU3
PAGEDEF=P1IBMTU3
```

*Figure 29: Example of ACIF parameters for processing documents with Unicode data*

In the example, on the first page, these 10 bytes are extracted in big endian format for FIELD1:

```
X’00200020002000200031’  /* 1 */
```

and these 16 bytes are extracted for FIELD2:

```
X’0020005000450 04C0053004800320032’  /* PELSH22 */
```

## Using regular expressions

A regular expression is a pattern that is used to match characters in a string. Here are examples of some of the most common regular expression patterns:

**Account**
Matches the characters "Account". By default, searches are case-sensitive.

**[A-Z]**
Matches one uppercase letter.

**[A-Z] {3}**
Matches for three consecutive uppercase letters.

**[0-9] {5}**
Matches five consecutive digits.

**[0-9]+**
Matches one or more digits.

**[^a-z]**
Matches everything except lowercase a to z.

**\s**
Matches one whitespace character, such as space or tab.

**\S**
Matches any character that is not whitespace.

ACIF can use a regular expression in the TRIGGER and FIELD parameters. In the TRIGGER parameter, the regular expression specifies the pattern to search for. In the FIELD parameter, the regular expression is applied to the characters that are extracted from the field in a way that is similar to using a mask. The regular expression must be specified in the code page indicated by the CPGID parameter.

If the CPGID of the document is EBCDIC, the regular expression can be specified as text. For example:

```
CPGID=037
TRIGGER1=*,*,'PAGE',(TYPE=GROUP)
TRIGGER2=*,25,REGEX='[A-Z]{3}-[A-Z]{6}',(TYPE=FLOAT)
FIELD1=0,9,2,(TRIGGER=1,BASE=TRIGGER)
FIELD2=0,38,10,(TRIGGER=2,BASE=0,REGEX='[A-Z] [0-9]{3}-\S+')
INDEX1='Page',FIELD1,(TYPE=GROUP,BREAK=YES)
INDEX2='Source-ID',FIELD2
```

In the example, TRIGGER2 uses a regular expression, which specifies a pattern of three uppercase letters, a hyphen, and six uppercase letters. The text "SUB-SOURCE" matches the pattern. FIELD2 uses a regular expression, which specifies one uppercase letter, a space, three numbers, a hyphen, and one or more non-whitespace characters. The character strings "Q 010-1", "I 000-RS", and "L 133-1B" match the regular expression pattern.

If the CPGID parameter of the document is not EBCDIC, the regular expression must be specified in hexadecimal in the code page that is indicated by the CPGID parameter. For example:

```
CPGID=850
TRIGGER1 = *,1,REGEX = X'5B302D395D7B337D' /* [0-9]{3} */
```

## Using a regular expression on the TRIGGER parameter

On the TRIGGER parameter, use the regular expression instead of a text string. A regular expression can be used on both a group trigger and a floating trigger. The maximum length of the regular expression is 250 bytes.

If an asterisk is specified for the column, ACIF searches the entire record for the string that matches the regular expression. If a column is specified, ACIF searches the text starting in that column for the string that matches the regular expression. The regular expression must match text that begins in that column. If a column range is specified, ACIF searches only the text within the column range for the string that matches the regular expression. The regular expression must match text that begins in one of the columns specified by the column range.

The maximum record length to which the regular expression can be applied is 2 KB (2048 bytes). If longer records are in the file, use a trigger column range to specify a subset of the record. When the regular expression matches the text in a record, ACIF looks for the next trigger, or, if all the group triggers are found, ACIF collects the fields.

## Using a regular expression on the FIELD parameter

On the FIELD parameter, use the regular expression instead of a mask. A mask and a regular expression cannot both be specified on the same FIELD parameter. The maximum length of the regular expression is 250 bytes.

The regular expression can be specified on a field based on a group trigger, a field based on a floating trigger, or a transaction field. Masks can be specified only on fields based on floating triggers and transaction fields. The maximum length of a field that can be specified in the FIELD parameter is 250 bytes.

ACIF extracts the text specified by the column and length values. After the field is extracted, ACIF applies the regular expression to the text. Any text that matches the regular expression is extracted for the field. If the matching text is shorter than the length specified in the FIELD parameter, it is padded with blanks until it equals the length. If the regular expression does not match any text in the field, one of these occurs:

- For a field based on a group trigger, the default value that is specified on the FIELD parameter is used. If no default value is specified, ACIF ends with error message APK488S.
- If the record is only long enough to contain part of the field, the regular expression is applied only to the portion of the record that is present.

## Using default values when regular expressions do not match

If the regular expression does not match any text in the field, a default value might be used. Whether a default value is used and which type is used, depends on one of these field types:

- GROUP field
  - If a regular expression does not match any text in the GROUP field, the default value that is specified on the FIELD parameter is used. If no default value is specified, ACIF ends processing with error message APK488S.
  - If the record is only long enough to contain part of the field, the regular expression is applied only to the portion of the record that is present.
  - If the record is not long enough to contain even the first byte of the field, the default value that is specified on the FIELD parameter is used. If no default value is specified, ACIF ends with error message APK449S.
- FLOAT field
  - If a regular expression does not match any text in the FLOAT field, no error exists, and the default value that is specified on the FIELD parameter is not used.
  - If the record is only long enough to contain part of the field, the regular expression is applied only to the portion of the record that is present.

- If the record is not long enough to contain even the first byte of the field, the default value that is specified on the FIELD parameter is used. If no default value is specified, ACIF ends processing with error message APK449S.
- Transaction fields (GROUPRANGE and PAGERANGE)
  - If the regular expression does not match any text in the transaction field, no error exists, and processing continues. A default value cannot be specified for a transaction field.
  - If the record is not long enough to contain the entire field, no error exists, and processing continues.

### Other considerations for using regular expressions

All text to which the regular expression is applied is converted to UTF-16. Keep in mind:

- Performance might be slower when you are using a regular expression than when you are using a text string.
- If the CPGID value is incorrect, the conversion might fail with error message APK2080I.

If the regular expression is not valid, ACIF fails with error message APK484S.

### Examples of using regular expressions

#### Using a regular expression for a trigger

```
TRIGGER1=*,1,REGEX='P[A-Z]{3} ',(TYPE=GROUP)
```

In this example, the regular expression matches text that begins in column 1 with the letter "P", three uppercase letters, and a space. For example, "PAGE ".

#### Using a regular expression to extract a date

```
TRIGGER1=*,1,'1'
FIELD1=0,13,18,( REGEX='[A-Z][a-z]+ [0-9]+, [0-9]{4}',DEFAULT='January 1, 1970')
INDEX1='Date',FIELD1
```

In this example, the regular expression matches a date in the form that begins with an uppercase letter, one or more lowercase letters, a space, one or more digits, a comma, a space, and four digits. For example, "July 4, 1956". If a date is not found that matches the regular expression pattern, a default of "January 1, 1970" is used.

#### Using a regular expression with a transaction field

```
TRIGGER1=*,1,'1'
FIELD1=0,30,3
FIELD2=*,*,12,(OFFSET=(59:70),ORDER=BYROW,REGEX='[0-9]{3}-[0-9]{2}-[0-9]{4}')
INDEX1='DEPT',FIELD1,(TYPE=GROUP)
INDEX2='SOCIAL SECURITY NUMBER',FIELD2,(TYPE=GROUPRANGE)
```

In this example, the regular expression is used to extract social security numbers that begin with three digits, a hyphen, two digits, a hyphen, and four digits.

## Concatenating the resource file and the document file

You can create a print file that contains all the required print resources by concatenating the output document file to the end of the resource file. Remember these considerations:

- Although AFP Workbench Viewer and the other PSF products support all types of inline resources, PSF/VSE supports only inline page definitions and form definitions.
- The offset information in the index object file applies to the document; that is, to the Begin Document (BDT) structured field. The offset information also applies to the file I/O level because a single

document is in the output document file. When you concatenate these two files, the offset information in the index object file no longer applies to the resultant file; that is, you cannot use this information to randomly access a specific page or page group without first determining the location of the BDT structured field. This situation is not a problem for AFP Workbench Viewer because it removes any inline objects before it uses the offset information.

## Processing inline resources

To process inline resources, do one of these tasks:

- Include the inline resources in the input file in the order in which they are used.

  **Note:** The input file cannot have inline resources in XML data.
- Specify EXTENSIONS=RESORDER (see "EXTENSIONS" on page 36).

ACIF does not look ahead in the inline resources. Therefore, if the inline resources are not in the correct order and EXTENSIONS=RESORDER is not specified, ACIF tries to read the referenced resource from a resource library. If the resource is not found, ACIF ends processing with an error.

Keep these considerations in mind:

- If EXTENSIONS=RESORDER is not specified, and a resource references another resource, the referenced resource must be included inline before the resource that references it. For example, if an overlay references a coded font that consists of the character set C0D0GT18 and code page T1D0BASE, the inline resources must be in this order:

```
code page T1D0BASE
character set C0D0GT18
coded font
overlay
```

- If a color management resource (CMR) associated with a data object is included inline, it must appear before the data object in the resource group. Otherwise, EXTENSIONS=RESORDER must be specified.
- When you are indexing and writing inline resources to the output file, the offsets in the index object file are the same as if you are doing regular resource collection to a resource file. This is because the offsets are calculated from the Begin Document (BDT) structured field, not from the beginning of the output document file. The offset from the BDT structured field to the indexed data is the same regardless of whether resources precede it.
- To determine how to write resources that are inline in the data file to the output file (OUTPUTDD), the resource file (RESOBJDD), or both, see "RESTYPE" on page 60.

## Specifying the IMAGEOUT parameter

ACIF converts IM1 format images in the input file, in overlays, and in page segments to uncompressed IOCA format, if IMAGEOUT=IOCA (the default) is specified. An uncompressed IOCA image can use a higher number of bytes than an IM1 image and can take more processing time to convert, especially for shaded or patterned areas.

Although IOCA is the MO:DCA-P standard for image data, and some data stream receivers might require it, all products cannot accept IOCA data. IBM suggests that you specify IMAGEOUT=ASIS, which produces all image data in the same format as in the input file, unless you have a specific requirement for IOCA images.

## Creating MO:DCA-P object containers

Object containers are MO:DCA-P resources that contain non-OCA objects, such as TIFF images, Encapsulated PostScript (EPS), JFIF, and microfilm setup. Object containers can be included in a data stream by using the Include Object (IOB) structured field. If you are including object containers from a page definition, see Appendix B, “Processing resources installed with resource access tables,” on page 217.

Not all presentation systems can present non-OCA objects, but ACIF includes them as part of the resource object if the RESTYPE parameter is set to ALL or includes OBJCON. When ACIF processes an IOB, it checks that the object type value is X'92' for OTHER, and the named object that is read from the resource library is not already a MO:DCA-P object. ACIF then creates a MO:DCA-P object container object by wrapping the raw object data in Object Container Data (OCD) structured fields and creating an Object Environment Group by using the values that are given by the IOB. The result is a MO:DCA-P object container that is saved in the resource object file. For information about the structure of object containers, see *Mixed Object Document Content Architecture Reference*.

## Processing Unicode complex text

ACIF supports input data sets that contain complex text, which is Unicode-encoded text that cannot be translated with the traditional one-code-point to one-glyph method; for example, bidirectional Arabic text or combined Hindi characters. Complex text requires:

- Extra processing.
- Identification with a PTOCA Unicode Complex Text or Glyph Layout Control (GLC) control sequence.
- A layout engine that examines runs of code points and maps the code points to runs of glyph indexes and their positions.
- TrueType and OpenType fonts.

Font layout tables contain script-specific information about glyph substitution, glyph positioning, justification, and baseline positioning, all of which are used by the layout engine to translate complex text.

For ACIF to correctly process GLC control sequences, the TrueType and OpenType fonts that are used must be placed inline in the print data set. ACIF looks in the inline resource group for the font that is referenced in the Map Data Resources (MDR) structured field. If ACIF cannot find the font inline, the complex text is not processed.

# Appendix B. Processing resources installed with resource access tables

Originally, ACIF supported only resource files that are installed as partitioned data set (PDS) members. This restriction meant that the resource names ACIF processed were limited to 8 characters. Now, with changes to MO:DCA and the use of resource access tables (RATs), ACIF no longer has this limitation on z/OS. For more information, see *Mixed Object Document Content Architecture Reference*.

A RAT maps a resource name that is specified in the MO:DCA-P data stream to information used to find and process the resource. The resources that are installed with a RAT include:

- TrueType and OpenType fonts
- Data object resources, such as color management resources (CMRs)

  For more information about using data objects and CMRs in color printing, see *PSF for z/OS: User's Guide*.

In order for ACIF to process resources installed with a RAT, you must:

1. Use an AFP resource installer to install the resources and create RATs in the appropriate resource directories on your system.
2. Run ACIF. ACIF searches in this order for object containers in these locations:
   a. Inline resources
   b. RAT entries in any directory that is specified with the USERPATH parameter
   c. File name that matches the object name in the paths (for each directory in the path, ACIF checks for a file with names in this order: 1) no extension 2) `.OBJ` 3) `.OBJECT`) or DD names that are specified with the USERLIB parameter
   d. RAT entries in any ACIF system paths that are specified with the OBJCPATH parameter for data objects or CMRs, or the FONTPATH parameter for TrueType and OpenType fonts
   e. File name in the system paths specified with the OBJCONLIB parameter.
3. Modify your application to include the RAT-installed resources in a page definition, form definition, or Map Data Resource (MDR) structured field. For more information about including resources, see *Page Printer Formatting Aid: User's Guide*.

**Note:** You can use the RESTYPE parameter to control what type of resources are included in the resource file.

# Appendix C. Structured fields that ACIF uses

General-use Programming Interface and Associated Guidance Information is contained in this information.

This information describes these structured fields: Tag Logical Element (TLE), Begin Resource Group (BRG), Begin Resource (BRS or BR), End Resource Group (ERG), End Resource (ERS or ER), Begin Print File (BPF), End Print File (EPF), and No Operation (NOP). It also describes the formats of the resource data sets.

**Note:** All MO:DCA-P data and resource files that are processed by ACIF must contain a X'5A' carriage control character at the start of each structured field.

## Tag Logical Element (TLE) structured field

ACIF can generate and process TLE structured fields, but not at the same time. If the input file contains TLEs, no indexing parameters are allowed with ACIF. TLEs in the input are only used to create an external index object (consisting of Index Element [IEL] structured fields). For the complete syntax of the TLE structured field, see *Mixed Object Document Content Architecture Reference*.

### TLEs generated by ACIF

ACIF generates TLEs from information that is provided with the TRIGGER, INDEX, and FIELD parameters. The attribute name comes from the INDEX parameter and the attribute value is extracted from the data by using the FIELD information. If EXTENSIONS=IDXCPGID is specified, the TLE and IEL structured fields that ACIF creates also contain encoding triplets (X'01') to identify which code page was used to encode the indexing data.

TLE structured fields can be associated with a group of pages or with individual pages. Consider a bank statement application. Each bank statement is a group of pages, and you might want to associate specific indexing information at the statement level (for example, account number, date, and customer name). You might also want to index (tag) a specific page within the statement, such as the summary page. The following example is a print file that contains TLEs at the group level and at the page level:

```
BDT
  BNG
    TLE Account #, 101030
    TLE Customer Name, Bob Smith
      BPG
        Page 1 data
      EPG
      BPG
        Page 2 data
      EPG
      ...
      ...
      BPG
        TLE Summary Page, n
        Page n data
      EPG
  ENG
  ...
EDT
```

### TLEs in MO:DCA-P input files

ACIF can accept input files that contain both group-level and page-level indexing tags. In the case where ACIF indexes the print file, it supports indexing specific pages if you are using enhanced ACIF indexing. See Chapter 4, “Enhanced indexing parameters,” on page 67.

You can also use the input record exit of ACIF to insert TLE structured fields into an AFP data stream (MO:DCA-P) file, where applicable. The indexing information in the TLE structured field applies to the page or group that contains them. In the case of groups, the TLE structured field can appear anywhere between a Begin Named Group (BNG) structured field and the first page (BPG structured field) in the group. In the case of composed-text pages, the TLE structured field can appear anywhere following the Active Environment Group, between the End Active Environment (EAG) and End Page (EPG) structured fields. Although ACIF does not limit the number of TLE structured fields that can be placed in a group or page, consider the performance and storage ramifications of the number included.

ACIF does not require the print file to be indexed in a uniform manner; that is, every page that contains TLE structured fields does not have to have the same number of tags as other pages or the same type of index attributes or tag values. This option allows a great deal of flexibility for the application. When ACIF completes processing a print file that contains TLE structured fields, the resultant indexing information file can contain records of variable length.

## TLEs in mixed-mode data input files

AFP does not explicitly allow TLE structured fields in mixed-mode documents (see the *Advanced Function Presentation: Programming Guide and Line Data Reference*). ACIF tolerates TLEs and passes them to the output file; however, because their use in line data is not architected, users must be aware that they might not get the results that they want. For example:

- No conditional processing is done on TLE structured fields; they are written where they are received.
- If a page is already started, the TLEs are stored in the page.
- If outside of a page, the TLEs are written between pages.
- The same processing applies to Link Logical Element (LLE) structured fields in a mixed-mode document.

The following examples illustrate the processing that is done on TLEs

**Example 1**

```
TLE
1Line data page 1
TLE
1Line Data page 2
```

The carriage control value of "1" at the start of the line data causes a new page. The example generates these output structured fields:

```
TLE - no page was started, so the TLE is before the BPG

BPG
BPT PTX EPT sequence with Line Data page 1 in PTX
TLE - when the TLE was encountered, CCM was still working on page 1
EPG

BPG
BPT PTX EPT sequence with Line Data Page 2 in the PTX
EPG
```

**Example 2**

```
TLE
1Line Data page 1
IMM
TLE
1Line Data page 2
```

The example generates:

```
TLE - no page was started, so the TLE is before the BPG

BPG
BPT PTX EPT sequence with Line Data page 1 in PTX
EPG
```

```
IMM
TLE - when the TLE was encountered, ACIF was between pages because the IMM
      caused a page boundary and page 1 was ended before ACIF encountered the TLE

BPG
BPT PTX EPT sequence with Line Data Page 2 in the PTX
EPG
```

This same scenario occurs when any structured field that causes a page boundary is encountered.

**Example 3**

```
TLE
1Line Data page 1  (this line of data has conditional processing applied,
                    which causes a switch to a medium map or data map AFTER LINE)
TLE
1Line Data page 2
```

The example generates:

```
TLE - no page was started, so the TLE is before the BPG

BPG
BPT PTX EPT sequence with Line Data page 1 in PTX
EPG

IMM - because condiitonal processing invoked a medium map
TLE - when the TLE was encountered, CCM was between pages because conditional
      processing caused an IMM to be inserted after the line data for page 1,
      which caused page 1 to end

BPG
BPT PTX EPT sequence with Line Data Page 2 in the PTX
EPG
```

## Begin Resource Group (BRG) structured field

ACIF assigns a null token name (X'FFFF') to this structured field and also creates several more triplets, including a Fully Qualified Name (FQN) type X'01' triplet, an Object Date and Time Stamp triplet, and an FQN type X'83' triplet. The FQN type X'01' triplet contains the data set name that is identified in the DDname statement for RESOBJDD. The Object Date and Time Stamp triplet contains date and time information from the operating system on which ACIF runs. The date and time values reflect when ACIF was called to process the print file. The FQN type X'83' triplet contains the MO:DCA-P output print file name that is identified by the DDname specified in the OUTPUTDD parameter.

## Begin Resource (BRS) structured field

ACIF uses this structured field to delimit the resources in the file. ACIF also uses the X'21' triplet on the BRS structured field (also called the BR structured field) to identify the type of resource that follows this structured field. For more information, see *Mixed Object Document Content Architecture Reference*.

For TrueType and OpenType fonts, the 8-character name on the BRS structured field is always DOFFONT. The actual full font name is stored in an FQN triplet on the BRS structured field and is used to match the font to the Map Data Resources (MDR) structured field. For more information, see *Using OpenType Fonts in an AFP System*.

## End Resource (ERS) and End Resource Group (ERG) structured fields

ACIF always assigns a null token name (X'FFFF') to the ERS and ERG structured fields it creates. The null name forces a match with the corresponding BRS and BRG structured fields. The ERS structured field is also called the ER structured field.

## Begin Print File (BPF) and End Print File (EPF) structured fields

MO:DCA-P data that ACIF processes might contain BPF and EPF structured fields, which define the boundaries of a print file. The BPF structured field is at the beginning of the MO:DCA-P input file and the EPF structured field is at the end of the file.

Some products concatenate the ACIF resource file (RESOBJDD) to the front of the output file (OUTPUTDD). However, if any data, such as a resource group, is found before the BPF structured field or after the EPF structured field in the ACIF output file, the MO:DCA-P data stream is not valid. By default, ACIF removes the BPF and EPF structured fields from the MO:DCA-P input file before it processes the file. Also, if the input file contains an index object, ACIF ignores it and does not pass it to the output file.

The EXTENSION=PASSPF parameter indicates that ACIF passes the BPF and EPF structured fields to the output file when they are found in the input file. This parameter also controls whether a BPF/EPF structured field pair that the input record exit tries to insert is actually inserted. If PASSPF is not specified and the input record tries to insert a BPF/EPF pair, the attempt fails and the pair is discarded.

**Notes:**

1. Be careful when you use PASSPF. If the output file contains BPF and EPF structured fields and it is concatenated with the resource file, the resulting MO:DCA-P data stream is not valid.
2. When PASSPF is specified and a BPF and EPF structured field pair exists in the input file, ACIF passes all Begin Document (BDT) and End Document (EDT) structured field pairs from the MO:DCA-P input file to the output data stream without adding the normal comment and time stamp triplets.
3. ACIF issues an error message if PASSPF is specified with the IDXCPGID parameter. If EXTENSIONS=ALL is specified, PASSPF is ignored and IDXCPGID is used.
4. ACIF does not verify whether the input file is MO:DCA interchange set IS/3 compliant.

Before ACIF discards or passes the BPF and EPF structured fields, it checks the placement and format of the pair in the input file; for example, if the input file contains a BPF structured field, it must also contain an EPF structured field. If the BPF/EPF pair is incorrect, ACIF issues an error message. If the placement and format is correct, ACIF discards or passes the pair.

## No Operation (NOP) structured field

An NOP structured field causes an application to move to the next instruction for processing without taking any other action.

NOP structured fields found *inside* inline resources are copied to the output resource library. NOP structured fields that are found *between* inline resources appear in the output AFP document after the Begin Document (BDT) structured fields (see "Begin Document (BDT) structured field" on page 231). NOP structured fields found *within* the line data or AFP input file are copied to the output file.

When an input file is mixed mode data and the page definition contains CONDITION statements, ACIF does conditional processing where the input records are buffered until the output page format is determined by the CONDITION. Originally, input records with NOP structured fields were not buffered with the other input records, which resulted in the NOP records changing position relative to the other input records. With PSF for z/OS, NOP records are buffered for CONDITION processing and maintain their position relative to the other input records. Therefore, any application that relies on NOPs appearing in a particular place in the output file might be affected.

**Keep in mind:** The use of an NOP structured field to carry comments or associate semantic data is not recommended because, by definition, the contents of NOP structured fields are ignored and not processed. For more information, see *Mixed Object Document Content Architecture Reference*.

## Format of the resources file

ACIF retrieves referenced AFP resources from specified libraries and creates a single file that contains these resources. With ACIF, you can control the number of resources and the type of resources in the file by using a combination of RESTYPE values and processing in the resource exit.

ACIF can retrieve all the resources that are used by the print file and can place them in a separate resource file. The resource file contains a resource group structure with this syntax:

```
BRG
  BRS
    AFP Resource 1
  ERS
  BRS
    AFP Resource 2
  ERS
  ..
  BRS
    AFP Resource n
  ERS
ERG
```

ACIF does not limit the number of resources that can be included in this object, but available storage is certainly a limiting factor.

# Appendix D. Format of the index object file

General-use Programming Interface and Associated Guidance Information is contained in this information.

One of the optional files ACIF can produce contains indexing, offset, and size information. The purpose of this index object file is to enable applications such as archival and retrieval applications to selectively determine the location of a page group or page within the AFP data stream print file, which is based on its index (tag) values.

This example shows the general internal format of an index object file:

```
BDI
  IEL GroupName=G1
    TLE (INDEX1)
    ...
    TLE (INDEXn)
      IEL PageName=G1P1
        TLE (INDEX1)
        ...
        TLE (INDEXn)
      ...
      IEL PageName=G1Pn
  ...
  IEL GroupName=Gn
    TLE (INDEX1)
    ...
    TLE (INDEXn)
      IEL PageName=GnP1
        TLE (INDEX1)
        ...
        TLE (INDEXn)
      ...
      IEL PageName=GnPn
EDI
```

The example illustrates an index object file that contains both page-level and group-level Index Element (IEL) structured fields.

## Group-Level Index Element (IEL) structured field

If INDEXOBJ=GROUP is specified, ACIF creates an index object file with this format:

```
BDI
  IEL Groupname=G1
    TLE
    ...
    TLE
  ...
  IEL Groupname=Gn
    TLE
    ...
    TLE
EDI
```

This format is useful to reduce the size of the index object file, but it allows manipulation only at the group level; that is, you cannot obtain the offset and size information for individual pages. You also lose any indexing information (TLEs) for pages; however, the TLE structured fields for the pages still exist in the output print file.

## Page-Level Index Element (IEL) structured field

If INDEXOBJ=ALL is specified, ACIF creates an index object file with this format:

```
BDI
  IEL Groupname=G1
    TLE
    ...
      IEL Pagename=G1P1
        TLE
        ...
      ...
      IEL Pagename=G1Pn....
  ...
  IEL Groupname=Gn
    TLE
    ...
      IEL Pagename=GnP1
      ...
      IEL Pagename=GnPn
        TLE
        ...
EDI
```

This example contains IEL structured fields for both pages and groups. Notice that TLE structured fields are associated with both pages and groups. When ACIF does the actual indexing function, it supports page-level indexing if you are using enhanced ACIF indexing. See Chapter 4, "Enhanced indexing parameters," on page 67.

An index object file that contains both page-level and group-level IEL structured fields can provide added flexibility and capability to applications that operate on the files that are created by ACIF. This type of index object file provides the best performance when you are using AFP Workbench Viewer to view a file.

## Begin Document Index (BDI) structured field

ACIF assigns a null token name (X'FFFF') and a Fully Qualified Name (FQN) type X'01' triplet to this structured field. The FQN type X'01' value is the file name that is identified by the DDname specified in the INDEXDD parameter. ACIF also creates an FQN type X'83' triplet that contains the name of the AFP output print file, which is identified by the DDname specified in the OUTPUTDD parameter.

ACIF also creates a Coded Graphic Character Set Global Identifier triplet X'01' by using the code page identifier that is specified in the CPGID parameter. ACIF assigns a null value (X'FFFF') to the Graphic Character Set Global Identifier. For more information about the CPGID parameter, see "CPGID" on page 35.

## Index Element (IEL) structured field

The IEL structured field associates indexing tags with a specific page or group of pages in the output document file. It also contains the byte and structured-field offset to the page or page group and the size of the page or page group in both bytes and structured-field count. This list shows the triplets that compose the IEL structured field:

- FQN Type X'8D'

  This triplet contains the name of the active medium map that is associated with the page or page group. For page groups, this triplet is the medium map that is active for the first page in the group because other medium maps can be referenced after subsequent pages in the group. If no medium map is explicitly called with an Invoke Medium Map (IMM) structured field, ACIF uses a null name (8 bytes of X'FF') to identify the default medium map; that is, the first medium map in the form definition.
- Object Byte Extent (X'57')

This triplet contains the size, in bytes, of the page or group this IEL structured field references. The value begins at 1.

- Object Structured Field Extent (X'59')

  This triplet contains the number of structured fields that compose the page or group that is referenced by this IEL structured field. In the host environment, each record contains only one structured field, so this value also represents the number of records in the page or group. The value begins at 1.

- Direct Byte Offset (X'2D')

  This triplet contains the offset, in bytes, from the start of the output print file to the particular page or group this IEL structured field references. The value begins at 0.

- Object Count (X'58')

  This triplet specifies the number of pages in a page group. This triplet applies only to group level IEL structured fields.

- Object Structured Field Offset (X'58')

  This triplet contains the offset, in number of structured fields, from the start of the output print file to the start of the particular page or group this IEL structured field references. The value begins at 0.

- FQN Type X'87'

  This triplet contains the name of the page with which this IEL structured field is associated. The name is the same as the FQN type X'01' on the BPG structured field. This triplet applies *only* to page-level IEL structured fields.

- FQN Type X'0D'

  This triplet contains the name of the page group with which this IEL structured field is associated. The name is the same as the FQN type X'01' on the BNG structured field. This triplet applies *only* to group-level IEL structured fields.

- Medium Map Page Number (X'56')

  This triplet defines the relative page count since the last Invoke Medium Map (IMM) structured field was processed or from the logical invocation of the default medium map. For page groups, this value applies to the first page in the group. The value begins at 1 and is incremented for each page.

## Tag Logical Element (TLE) structured field

ACIF creates TLE structured fields as part of its indexing process, or it can receive these structured fields from the input print file. When ACIF creates TLE structured fields, the first TLE structured field is INDEX1, the next TLE structured field is INDEX2, and so on, to a maximum of eight per page group. When ACIF processes a print file that contains TLE structured fields, it always outputs the TLE structured fields in the same order and position. The TLE structured fields in this object are the same as those structured fields in the output document file, and they follow the IEL structured field with which they are associated.

## End Document Index (EDI) structured field

ACIF assigns a null token name (X'FFFF') to this structured field, which forces a match with the BDI structured field name.

# Appendix E. Format of the output document file

This information contains General-use Programming Interface and Associated Guidance Information.

ACIF can create three separate output files, one of which is the print file in AFP data stream format. In doing so, ACIF might create these structured fields:

- Tag Logical Element (TLE)
- Begin Named Group (BNG)
- End Named Group (ENG)

The TLE is described in Appendix D, "Format of the index object file," on page 225; the other two structured fields are described in this information. Figure 30 on page 229 and Figure 31 on page 230 illustrate the two possible AFP data stream document formats ACIF can produce.

```
BDT
  BNG Groupname=(index value + sequence number)
    TLE (INDEX1)
    TLE (INDEX2)
    ...
    TLE (INDEXn)
      BPG
        Page 1 of group 1
      EPG
      BPG
        Page 2 of group 1
      EPG
      ...
      BPG
        Page n of group 1
      EPG
  ENG
  ...
  BNG Groupname=(index value + sequence number)
    TLE (INDEX1)
    TLE (INDEX2)
    ...
    TLE (INDEXn)
      BPG
        Page 1 of group n
      EPG
      BPG
        Page 2 of group n
      EPG
      ...
      BPG
        Page n of group n
      EPG
  ENG
EDT
```

*Figure 30: Example of code that contains group-level indexing*

Figure 30 on page 229 illustrates the format ACIF produces when it converts and indexes a print file with group-level indexing.

```
BDT
  BNG Groupname=(index value + sequence number)
    TLE (INDEX1)
    TLE (INDEX2)
    ...
    TLE (INDEXn)
      BPG
        TLE (INDEX1)
        ...
        TLE (INDEXn)
        Page 1 of group 1
      EPG
      BPG
        Page 2 of group 1
      EPG
      ...
      BPG
        TLE (INDEX1)
        ...
        TLE (INDEXn)
        Page n of group 1
      EPG
  ENG
  ...
  BNG Groupname=(index value + sequence number)
    TLE (INDEX1)
    TLE (INDEX2)
    ...
    TLE (INDEXn)
      BPG
        Page 1 of group n
      EPG
      BPG
        TLE (INDEX1)
        ...
        TLE (INDEXn)
        Page 2 of group n
      EPG
      ...
      BPG
        Page n of group n
      EPG
  ENG
EDT
```

*Figure 31: Example of code that contains group- and page-level indexing*

Figure 31 on page 230 illustrates an input file that is already indexed (tagged) and converted to MO:DCA-P format. This example shows that you can index (tag) both groups and pages from an application.

## Page groups

Page groups are architected groups of one or more pages to which some action or meaning is assigned. Consider the example of the bank statement application. Each bank statement in the print file comprises one or more pages. By grouping each statement in a logical manner, you can assign specific indexing or tag information to each group (statement). You can then use this grouping to do actions such as archival, retrieval, viewing, preprocessing, and postprocessing. The grouping also represents a natural hierarchy. For the AFP Workbench Viewer, you can locate a group of pages and then locate a page within a group. If you again use the example of the bank statement application, you can see how useful this grouping can be. You can retrieve from the archival (storage) system all of the bank statements for a specific branch. You can then select a specific bank statement (group-level) to view and select a tagged summary page (page-level).

## Begin Document (BDT) structured field

When ACIF processes an AFP data stream print file, it checks for a Fully Qualified Name (FQN) type X'01' triplet in the BDT structured field. If the FQN triplet exists, ACIF uses it; otherwise, ACIF creates one by using the file name that is identified in the DDname statement for OUTPUTDD. ACIF uses the FQN value when it creates an FQN type X'83' triplet on the Begin Document Index (BDI) structured field in the index object file and on the Begin Resource Group (BRG) structured field in the resource file. Although the input file can contain multiple BDT structured fields, unless INDEXOBJ=BDTLY is specified, the ACIF output contains only one BDT structured field. (The same is true of End Document (EDT) structured fields.)

For line data, ACIF creates the BDT structured field. ACIF assigns a null token name (X'FFFF') and creates an FQN type X'01' triplet by using the file name that is identified in the DDname statement for OUTPUTDD.

ACIF also creates a Coded Graphic Character Set Global Identifier triplet X'01' by using the code page identifier that is specified in the CPGID parameter. ACIF assigns a null value (X'FFFF') to the Graphic Character Set Global Identifier. For more information about the CPGID parameter, see "CPGID" on page 35.

ACIF creates two more FQN triplets for the resource name (type X'0A') and the index object name (type X'98'). These two values are the same as those values contained in their respective type X'01' triplets on the BDI and BRG structured fields.

ACIF also creates a comment triplet (X'65') that shows the current APAR level of the code that is used to build the AFP document.

## Begin Named Group (BNG) structured field

When ACIF processes an AFP data stream print file that contains page groups, it checks for an FQN type X'01' triplet on each BNG structured field. If the FQN triplet exists, ACIF uses the value when it creates an FQN type X'0D' triplet on the corresponding Index Element (IEL) structured field in the index object file. ACIF appends an 8-byte rolling sequence number to ensure uniqueness in the name. If no FQN triplet exists, ACIF creates one and unless UNIQUEBNGS=NO is specified, appends a rolling, 8-byte EBCDIC sequence number to ensure uniquely named groups, up to a maximum of 99999999 groups within a print file.

When ACIF indexes a print file, it creates the BNG structured fields. It assigns a rolling 8-byte EBCDIC sequence number to the token name (for example, 00000001 where 1=X'F1'). The sequence number begins with 00000001 and is incremented by 1 each time a group is created. Unless UNIQUEBNGS=NO is specified, ACIF also creates an FQN type X'01' triplet by concatenating the specified index value (GROUPNAME) with the same sequence number used in the token name. If the value of the index that is specified in GROUPNAME is too long, the trailing bytes are replaced by the sequence number. This situation occurs only if the specified index value exceeds 242 bytes. A maximum of 99999999 groups can be supported before the counter wraps, which means that ACIF ensures a maximum of 99999999 unique group names.

## Tag Logical Element (TLE) structured field

As mentioned in "Tag Logical Element (TLE) structured field" on page 227, ACIF creates TLE structured fields as part of its indexing process, or it can receive these structured fields from the input print file. When ACIF creates TLE structured fields, the first TLE is INDEX1, the next TLE is INDEX2, and so on, to a maximum of eight per page group. When ACIF processes a print file that contains TLE structured fields, it always outputs the TLE structured fields in the same order and position.

## Begin Page (BPG) structured field

When ACIF processes an AFP data stream print file, it checks for an FQN type X'01' triplet on every page. If the FQN triplet exists, ACIF uses the value when it creates an FQN type X'87' triplet on the corresponding Index Element (IEL) structured field in the index object file. If one does not exist, ACIF creates one by using a rolling 8-byte EBCDIC sequence number, which ensures uniquely named pages up to a maximum of 99999999 pages within a print file. ACIF creates IEL structured fields for pages only if INDEXOBJ=ALL is specified.

When ACIF processes a line data print file, it creates the BPG structured fields. It assigns a rolling 8-byte EBCDIC sequence number to the token name (for example, 00000001, where 1=X'F1'). The sequence number begins with 00000001 and is incremented by 1 each time a group is created. ACIF also creates an FQN type X'01' triplet by using the same sequence number value, and uses this value in the appropriate IEL structured field if INDEXOBJ=ALL is specified. A maximum of 99999999 groups can be supported before the counter wraps, which means that ACIF ensures a maximum of 99999999 unique group names.

## End Named Group (ENG), End Document (EDT), and End Page (EPG) structured fields

ACIF always assigns a null token name (X'FFFF') to the E*xx* structured fields it creates. It does not modify the E*xx* structured field that is created by an application unless it creates an FQN type X'01' triplet for the corresponding B*xx* structured field. In this case, it assigns a null token name (X'FFFF'), which forces a match with the B*xx* name.

## Output MO:DCA-P data stream

Regardless of the input data stream, ACIF always produces output files in the MO:DCA-P format. Each structured field in the file is a single record that is preceded by a X'5A' carriage control character.

**Note:** When BPF and EPF structured fields are found in the input file, ACIF does not pass them to the output file unless the EXTENSION=PASSPF parameter is specified. See "Begin Print File (BPF) and End Print File (EPF) structured fields" on page 222 for more information.

The following information describes the required changes ACIF must make to an AFP input file to support MO:DCA-P output format.

### Composed Text Control (CTC) structured field

Because this structured field is obsolete, ACIF ignores it and does not pass it to the output file.

### Map Coded Font (MCF) Format 1 structured field

ACIF converts this structured field to an MCF Format 2 structured field. Unless MCF2REF=CF is specified, ACIF resolves the coded font into the appropriate font character set and code page pairs.

### Map Coded Font (MCF) Format 2 structured field

ACIF does not modify this structured field, and it does *not* map any referenced GRID values to the appropriate font character set and code page pairs. This situation might affect document integrity in the case of archival because no explicit resource names are referenced for ACIF to retrieve.

ACIF requires that FOCA fonts be named according to the suggested IBM naming conventions in Table 7 on page 233. If the naming conventions are not followed, you might get unexpected results. For example, ACIF bases the font character rotation on the second character in the font name.

*Table 7: FOCA font naming conventions*

| Font Resource Objects | Prefix |
|---|---|
| 240- and 300-pel character set | C0 |
| 3800 character set | C1–CG |
| Outline character set | CZ |
| Code page; extended code page | T1 |
| 240- and 300-pel coded font | X0 (required) |
| 3800 coded font | X1–XG (required) |
| Outline coded font | XZ (required) |

## Presentation Text Data Descriptor (PTD) Format 1 structured field

ACIF converts this structured field to a PTD Format 2 structured field.

## Inline resources

Inline resources at the beginning of the input file are copied to the resource file (RESOBJDD) if the appropriate RESTYPE value is specified. Inline resources are only copied to the output file (OUTPUTDD) if RESTYPE=INLINE is specified.

## Page definitions

Because page definitions are used only to compose line data into pages, this resource is not included in the resource file. The page definition is not included because it is no longer needed to view or print the document file.

# Appendix F. Accessibility

Accessible publications for this product are offered through IBM Knowledge Center (www.ibm.com/support/knowledgecenter/SSLTBW/welcome).

If you experience difficulty with the accessibility of any z/OS information, send a detailed email message to mhvrcfs@us.ibm.com.

## Accessibility features

Accessibility features help users who have physical disabilities such as restricted mobility or limited vision use software products successfully. The accessibility features in z/OS can help users do the following tasks:

- Run assistive technology such as screen readers and screen magnifier software.
- Operate specific or equivalent features by using the keyboard.
- Customize display attributes such as color, contrast, and font size.

## Consult assistive technologies

Assistive technology products such as screen readers function with the user interfaces found in z/OS. Consult the product information for the specific assistive technology product that is used to access z/OS interfaces.

## Keyboard navigation of the user interface

You can access z/OS user interfaces with TSO/E or ISPF. The following information describes how to use TSO/E and ISPF, including the use of keyboard shortcuts and function keys (PF keys). Each guide includes the default settings for the PF keys.

- *z/OS TSO/E Primer*
- *z/OS TSO/E User's Guide*
- *z/OS ISPF User's Guide Vol I*

## Dotted decimal syntax diagrams

Syntax diagrams are provided in dotted decimal format for users who access IBM Knowledge Center with a screen reader. In dotted decimal format, each syntax element is written on a separate line. If two or more syntax elements are always present together (or always absent together), they can appear on the same line because they are considered a single compound syntax element.

Each line starts with a dotted decimal number; for example, 3 or `3.1` or `3.1.1`. To hear these numbers correctly, make sure that the screen reader is set to read out punctuation. All the syntax elements that have the same dotted decimal number (for example, all the syntax elements that have the number `3.1`) are mutually exclusive alternatives. If you hear the lines `3.1 USERID` and `3.1 SYSTEMID`, your syntax can include either `USERID` or `SYSTEMID`, but not both.

The dotted decimal numbering level denotes the level of nesting. For example, if a syntax element with dotted decimal number 3 is followed by a series of syntax elements with dotted decimal number 3.1, all the syntax elements numbered 3.1 are subordinate to the syntax element numbered 3.

Certain words and symbols are used next to the dotted decimal numbers to add information about the syntax elements. Occasionally, these words and symbols might occur at the beginning of the element itself. For ease of identification, if the word or symbol is a part of the syntax element, it is preceded by the backslash (\) character. The * symbol is placed next to a dotted decimal number to indicate that the syntax element repeats. For example, syntax element *FILE with dotted decimal number 3 is given the format 3 * FILE. Format 3* FILE indicates that syntax element FILE repeats. Format 3* * FILE indicates that syntax element * FILE repeats.

Characters such as commas, which are used to separate a string of syntax elements, are shown in the syntax just before the items they separate. These characters can appear on the same line as each item, or on a separate line with the same dotted decimal number as the relevant items. The line can also show another symbol to provide information about the syntax elements. For example, the lines 5.1*, 5.1 LASTRUN, and 5.1 DELETE mean that if you use more than one of the LASTRUN and DELETE syntax elements, the elements must be separated by a comma. If no separator is given, assume that you use a blank to separate each syntax element.

If a syntax element is preceded by the % symbol, it indicates a reference that is defined elsewhere. The string that follows the % symbol is the name of a syntax fragment rather than a literal. For example, the line 2.1 %OP1 means that you must refer to separate syntax fragment OP1.

The following symbols are used next to the dotted decimal numbers.

**? indicates an optional syntax element**
The question mark (?) symbol indicates an optional syntax element. A dotted decimal number followed by the question mark symbol (?) indicates that all the syntax elements with a corresponding dotted decimal number, and any subordinate syntax elements, are optional. If there is only one syntax element with a dotted decimal number, the ? symbol is displayed on the same line as the syntax element, (for example 5? NOTIFY). If there is more than one syntax element with a dotted decimal number, the ? symbol is displayed on a line by itself, followed by the syntax elements that are optional. For example, if you hear the lines 5 ?, 5 NOTIFY, and 5 UPDATE, you know that the syntax elements NOTIFY and UPDATE are optional. That is, you can choose one or none of them. The ? symbol is equivalent to a bypass line in a railroad diagram.

**! indicates a default syntax element**
The exclamation mark (!) symbol indicates a default syntax element. A dotted decimal number followed by the ! symbol and a syntax element indicate that the syntax element is the default option for all syntax elements that share the same dotted decimal number. Only one of the syntax elements that share the dotted decimal number can specify the ! symbol. For example, if you hear the lines 2? FILE, 2.1! (KEEP), and 2.1 (DELETE), you know that (KEEP) is the default option for the FILE keyword. In the example, if you include the FILE keyword, but do not specify an option, the default option KEEP is applied. A default option also applies to the next higher dotted decimal number. In this example, if the FILE keyword is omitted, the default FILE(KEEP) is used. However, if you hear the lines 2? FILE, 2.1, 2.1.1! (KEEP), and 2.1.1 (DELETE), the default option KEEP applies only to the next higher dotted decimal number, 2.1 (which does not have an associated keyword), and does not apply to 2? FILE. Nothing is used if the keyword FILE is omitted.

*** indicates an optional syntax element that is repeatable**
The asterisk or glyph (*) symbol indicates a syntax element that can be repeated zero or more times. A dotted decimal number followed by the * symbol indicates that this syntax element can be used zero or more times; that is, it is optional and can be repeated. For example, if you hear the line 5.1* data area, you know that you can include one data area, more than one data area, or no data area. If you hear the lines 3* , 3 HOST, 3 STATE, you know that you can include HOST, STATE, both together, or nothing.

**Notes:**

1. If a dotted decimal number has an asterisk (*) next to it and there is only one item with that dotted decimal number, you can repeat that same item more than once.
2. If a dotted decimal number has an asterisk next to it and several items have that dotted decimal number, you can use more than one item from the list, but you cannot use the items more than once each. In the previous example, you can write HOST STATE, but you cannot write HOST HOST.

3. The * symbol is equivalent to a loopback line in a railroad syntax diagram.

**+ indicates a syntax element that must be included**

The plus (+) symbol indicates a syntax element that must be included at least once. A dotted decimal number followed by the + symbol indicates that the syntax element must be included one or more times. That is, it must be included at least once and can be repeated. For example, if you hear the line `6.1+ data area`, you must include at least one data area. If you hear the lines `2+, 2 HOST, and 2 STATE`, you know that you must include `HOST, STATE,` or both. Similar to the * symbol, the + symbol can repeat a particular item if it is the only item with that dotted decimal number. The + symbol, like the * symbol, is equivalent to a loopback line in a railroad syntax diagram.

# Notices

## Terms and conditions for product documentation

### Applicability

### Personal use

### Commercial use

reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of IBM.

**Rights**

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

IBM reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by IBM, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

IBM MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.

## IBM Online Privacy Statement

IBM Software products, including software as a service solutions, ("Software Offerings") may use cookies or other technologies to collect product usage information, to help improve the end user experience, to tailor interactions with the end user, or for other purposes. In many cases no personally identifiable information is collected by the Software Offerings. Some of our Software Offerings can help enable you to collect personally identifiable information. If this Software Offering uses cookies to collect personally identifiable information, specific information about this offering's use of cookies is set forth below.

Depending upon the configurations deployed, this Software Offering may use session cookies that collect each user's name, email address, phone number, or other personally identifiable information for purposes of enhanced user usability and single sign-on configuration. These cookies can be disabled, but disabling them will also eliminate the functionality they enable.

If the configurations deployed for this Software Offering provide you as customer the ability to collect personally identifiable information from end users via cookies and other technologies, you should seek your own legal advice about any laws applicable to such data collection, including any requirements for notice and consent.

For more information about the use of various technologies, including cookies, for these purposes, see IBM's Privacy Policy at ibm.com/privacy and IBM's Online Privacy Statement at ibm.com/privacy/details in the section entitled "Cookies, Web Beacons and Other Technologies," and the "IBM Software Products and Software-as-a-Service Privacy Statement" at ibm.com/software/info/product-privacy.

## Policy for unsupported hardware

Various z/OS elements, such as DFSMS, JES2, JES3, and MVS, contain code that supports specific hardware servers or devices. In some cases, this device-related element support remains in the product even after the hardware devices pass their announced End of Service date. z/OS may continue to service element code; however, it will not provide service related to unsupported hardware devices. Software problems related to these devices will not be accepted for service, and current service activity will cease if a problem is determined to be associated with out-of-support devices. In such cases, fixes will not be issued.

## Minimum supported hardware

The minimum supported hardware for z/OS releases identified in z/OS announcements can subsequently change when service for particular servers or devices is withdrawn. Likewise, the levels of other software products supported on a particular release of z/OS are subject to the service support lifecycle of those products. Therefore, z/OS and its product publications (for example, panels, samples, messages, and product documentation) can include references to hardware and software that is no longer supported.

- For information about software support lifecycle, see: IBM Lifecycle Support for z/OS (www.ibm.com/software/support/systemsz/lifecycle)
- For information about currently-supported IBM hardware, contact your IBM representative.

## Programming interfaces

This publication includes documentation of intended programming interfaces that the customer can use to write programs to obtain the services of ACIF.

ACIF provides no macros that let a customer installation write programs that use the services of ACIF.

**Attention:** Do not use any ACIF macros as programming interfaces.

## Trademarks

# Glossary

This glossary defines technical terms and abbreviations used in PSF for z/OS documentation. If you do not find the term you are looking for, see IBM Glossary of Computing Terms (www.ibm.com/software/globalization/terminology).

These cross-references are used in this glossary:

**See**
: Refers to preferred synonyms or to defined terms for acronyms and abbreviations.

**See also**
: Refers to related terms that have similar, but not synonymous, meanings, or to contrasted terms that have opposite or substantively different meanings.

## A

**ACIF**
: See AFP Conversion and Indexing Facility.

**Advanced Function Presentation (AFP)**
: A set of licensed programs, together with user applications, that use the all-points-addressable concept to print data on a wide variety of printers or to display data on a variety of display devices. AFP includes creating, formatting, archiving, retrieving, viewing, distributing, and printing information.

**AFP**
: See Advanced Function Presentation.

**AFP Conversion and Indexing Facility (ACIF)**
: An optional feature of PSF for z/OS that converts a print file into a MO:DCA document, creates an index file for later retrieval and viewing, and retrieves resources used by an AFP document into a separate file.

**AFP resource installer**
: An application that runs on a Windows workstation and installs and manages fonts, data objects, and color management resources (CMRs) in resource libraries. It also creates CMRs and associates CMRs with data objects.

**AFP Toolbox**
: A product that assists application programmers in formatting printed output. Without requiring knowledge of the AFP data stream, AFP Toolbox provides access to sophisticated AFP functions through a callable C, C++, or COBOL interface.

**AFP Workbench Viewer**
: A product that displays AFP and ASCII files at a Windows workstation in the same format they are printed.

**alphanumeric**
: Pertaining to a character set that contains letters, digits, and other characters, such as punctuation marks.

**American National Standards Institute (ANSI)**
: A private, nonprofit organization whose membership includes private companies, US government agencies, and professional, technical, trade, labor, and consumer organizations. ANSI coordinates the development of voluntary consensus standards in the US.

**American Standard Code for Information Interchange (ASCII)**
: A standard code used for information exchange among data processing systems, data communication systems, and associated equipment. ASCII uses a coded character set consisting of 7-bit coded characters. See also Extended Binary Coded Decimal Interchange Code.

**anchor point**
: The point in a document that signals to ACIF the beginning of a group of pages, after which it adds indexing structured fields to delineate this group. See also trigger.

**ANSI**
: See American National Standards Institute.

**architecture**
: The set of rules and conventions that govern the creation and control of data types such as text, image, graphics, font, fax, color, audio, bar code, and multimedia.

**ASCII**
: See American Standard Code for Information Interchange.

## B

**bar code**
: An array of elements, such as bars, spaces, and two-dimensional modules, that encode data in a particular symbology. The elements are arranged in a predetermined pattern following unambiguous rules defined by the symbology.

**Bar Code Object Content Architecture (BCOCA)**
: An architected collection of constructs used to interchange and present bar code data.

**BCOCA**
: See Bar Code Object Content Architecture.

**big endian**
: Pertaining to the order in which binary data is stored or transmitted with the most significant byte placed first. See also little endian.

## C

**carriage control character**
: A character that is used to specify a write, space, or skip operation. See also control character.

**CCSID**
: See coded character set identifier.

**character**

1. Any symbol that can be entered on a keyboard, printed, or displayed. For example, letters, numbers, and punctuation marks are all characters.
2. In a computer system, a member of a set of elements that is used for the representation, organization, or control of data. See also control character, glyph, and graphic character.
3. In bar codes, a single group of bars and spaces that represent an individual number, letter, punctuation mark, or other symbol.

**character rotation**
: The alignment of a character with respect to its character baseline, measured in degrees in a clockwise direction. See also rotation and orientation.

**character set**
: A defined set of characters that can be recognized by a configured hardware or software system. A character set can be defined by alphabet, language, script, or any combination of these items. See also font character set.

**CMR**
: See color management resource.

**coded character set identifier (CCSID)**
: A 16-bit number that includes a specific set of encoding scheme identifiers, character set identifiers, code page identifiers, and other information that uniquely identifies the coded graphic-character representation.

**coded font**
: A font file that associates a code page and a font character set. For double-byte fonts, a coded font associates multiple pairs of code pages and font character sets.

**code page**
A particular assignment of code points to graphic characters. Within a given code page, a code point can only represent one character. A code page also identifies how undefined code points are handled. See also coded font and extended code page.

**color management resource (CMR)**
An object that provides color management in presentation environments.

**complex text**
Unicode-encoded text that cannot be rendered in the traditional one-code-point to one-glyph fashion, such as bidirectional Arabic text or combined Hindi characters.

**concatenated data set**
A group of logically connected data sets that are treated as one data set for the duration of a job step. See also data set, partitioned data set, and library.

**control character**

1. A character that represents a command that is sent to an output device, such as a printer or monitor. Examples are line-feed, shift-in, shift-out, carriage return, font change, and end of transmission. See also carriage control character.
2. A character whose occurrence in a particular context initiates, modifies, or stops a control function.

**copy group**
In PSF, an internal object in a form definition or a print data set that controls such items as modifications to a form, page placement, and overlays.

## D

**data object resource**
An object container resource or IOCA image resource that is either printer resident or downloaded. Data object resources can be:

- Used to prepare for the presentation of a data object, such as with a resident color profile resource object
- Included in a page or overlay through the Include Object (IOB) structured field; for example, PDF single-page and multiple-page objects, Encapsulated PostScript (EPS) objects, and IOCA images
- Called from within a data object; for example, PDF resource objects

**data set**
The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access. See also file, concatenated data set, partitioned data set, and sequential data set.

**data stream**
The commands, control codes, data, or structured fields that are transmitted between an application program and a device, such as printer or nonprogrammable display station.

**DCF**
See Document Composition Facility.

**device link profile**
A profile that preserves black channel separation across the entire color space using any Color Management Module (CMM).

**document**

1. A machine-readable collection of one or more objects that represent a composition, a work, or a collection of data.
2. Data that has already been composed into pages and that contains a Begin Document and an End Document structured field.

**Document Composition Facility (DCF)**
An IBM licensed program used to format input to a printer.

**download**
To transfer data from a computer to a connected device, such as a workstation or a printer. Typically, users download from a large computer to a diskette or fixed disk on a smaller computer or from a system unit to an adapter.

**Download for z/OS**
An optional feature of PSF for z/OS that uses TCP/IP to automatically send data sets from the JES spool, without formatting them, directly to a PSF for z/OS, OnDemand, AIX, Linux, or Windows server.

## E

**EBCDIC**
See Extended Binary Coded Decimal Interchange Code.

**Extended Binary Coded Decimal Interchange Code (EBCDIC)**
A coded character set of 256 eight-bit characters developed for the representation of textual data. EBCDIC is not compatible with ASCII character coding. See also American Standard Code for Information Interchange.

**extended code page**
A code page that is stored in a partitioned data set (PDS or PDSE) in a font resource library or in a UNIX file in a font path library. Extended code pages might contain Unicode values that a printer uses to print EBCDIC or ASCII encoded text strings with TrueType and OpenType fonts.

## F

**file**

1. A collection of related data that is stored and retrieved by an assigned name. A file can include information that starts a program (program-file object), contains text or graphics (data-file object), or processes a series of commands (batch file).
2. See also data set, partitioned data set, sequential data set, and library.

**FOCA**
See Font Object Content Architecture.

**font**

1. A family or assortment of characters of a given size and style, for example, 9-point Bodoni modern. A font has a unique name and might have a registry number.
2. A particular type style (for example, Bodoni or Times Roman) that contains definitions of character sets, marker sets, and pattern sets. See also coded font.

**font character set**

1. Part of an AFP font that contains the raster patterns, identifiers, and descriptions of characters. See also character set.
2. A Font Object Content Architecture (FOCA) resource containing descriptive information, font metrics, and the digital representation of character shapes for a specified graphic character set.

**Font Object Content Architecture (FOCA)**
An architecture that defines the content of digital font resources by means of a set of parameter definitions.

**form**

1. A physical piece of paper or other medium on which data is printed. See also page and sheet.
2. A display screen, printed document, or file with defined spaces for information to be inserted.

**form definition**
An AFP resource object used by PSF that defines the characteristics of the form or printed media, including: overlays to be used, duplex printing, text suppression, the position of composed-text data on the form, and the number and modifications of a page.

## G

**glyph**

1. A graphic symbol whose appearance conveys information, for example, the vertical and horizontal arrows on cursor keys that indicate the directions in which they control cursor movement.
2. An image, typically of a character, in a font. See also character and graphic character.

**GOCA**
See Graphics Object Content Architecture.

**graphic character**

1. A visual representation of a character, other than a control character, that is typically produced by writing, printing, or displaying. See also glyph.
2. A member of a set of symbols that represent data. Graphic characters can be letters, digits, punctuation marks, or other symbols.

**Graphics Object Content Architecture (GOCA)**
An architecture that provides a collection of graphics values and control structures used to interchange and present graphics data.

**group**

1. A logical organization of users whose membership allows them to perform the same activities or provide the same authority to access resources.
2. A series of records logically joined together or having the same value for a particular field in all records.
3. A named collection of sequential pages that form a logical subset of a document.

## H

**hexadecimal**
Pertaining to a numbering system that has a base of 16.

## I

**i5/OS**
The IBM licensed program that was used as the operating system for System i® servers. The predecessor to i5/OS was OS/400®. See IBM i.

**IBM i**
The IBM licensed program that is used as the principal operating system for Power Systems™ products. The predecessor to IBM i was i5/OS, which was preceded by OS/400.

**image**

1. A pattern of toned and untoned pels that form a picture. See also impression.
2. An electronic representation of an original document or picture produced by a scanning device or created from software.

**Image Object Content Architecture (IOCA)**
An architecture that provides a collection of constructs used to interchange and present images, such as printing image data on a page, page segment, or overlay.

**impression**
The transfer of an image to a sheet of paper. Multiple impressions can be printed on each side of a sheet. Printer speed is often measured in impressions per minute (ipm).

**indexing**
In ACIF, a process of matching reference points within a file and creating structured field tags within the MO:DCA document and the separate index object file.

**indexing with data values**
Adding indexing tags to a MO:DCA document by using data that is already in the document and that is consistently located in the same place in each group of pages.

**indexing with literal values**
Adding indexing tags to a MO:DCA document by assigning literal values as indexing tags, because the document is not organized such that common data is located consistently throughout the document.

**index object file**
A file created by ACIF that contains Index Element (IEL) structured fields, which identify the location of the tagged groups in the AFP file. The indexing tags are contained in the Tag Logical Element (TLE) structured fields.

**inline resource**
A resource contained in a print file or a print data set.

**Intelligent Printer Data Stream (IPDS)**
An all-points-addressable data stream that lets users position text, images, graphics, and bar codes at any defined point on a printed page. IPDS is the strategic AFP printer data stream generated by PSF.

**IOCA**
See Image Object Content Architecture.

**IPDS**
See Intelligent Printer Data Stream.

## J

**JCL**
See job control language.

**JES**
See Job Entry Subsystem.

**JES2**
An MVS subsystem that receives jobs into the system, converts them to internal format, selects them for processing, processes their output, and purges them from the system. In an installation with more than one processor, each JES2 processor independently controls its job input, scheduling, and output processing. See also Job Entry Subsystem and JES3.

**JES3**
An MVS subsystem that receives jobs into the system, converts them to internal format, selects them for processing, processes their output, and purges them from the system. In complexes that have several loosely coupled processing units, the JES3 program manages processors so that the global processor exercises centralized control over the local processors and distributes jobs to them by using a common job queue. See also Job Entry Subsystem and JES2.

**job control language (JCL)**
A command language that identifies a job to an operating system and describes the job's requirements.

**Job Entry Subsystem (JES)**
An IBM licensed program that receives jobs into the system and processes all output data that is produced by jobs. See also JES2 and JES3.

## L

**library**

1. A system object that serves as a directory to other objects. A library groups related objects, and allows the user to find objects by name.
2. A data file that contains copies of a number of individual files and control information that allows them to be accessed individually.
3. A partitioned data set or a series of concatenated partitioned data sets.

4. In VSE, a collection of data stored in sublibraries on disk. A library consists of at least one sublibrary in which data is stored as members of various types such as phase, object module, or source book.

**library member**

1. A named collection of records or statements in a library. See also resource object.
2. In VSE, the smallest unit of data that can be stored in and retrieved from a sublibrary.

**licensed program**
A separately priced program and its associated materials that bear a copyright and are offered to customers under the terms and conditions of a licensing agreement.

**line data**
Data prepared for printing on a line printer without any data placement or presentation information. Line data can contain carriage-control characters and table-reference characters (TRC) for spacing and font selections. See also record format line data and traditional line data.

**little endian**
Pertaining to the order in which binary data is stored or transmitted with the least significant byte placed first. See also big endian.

**logical page**
The defined presentation space on the physical form. All the text and images in the print data must fit within the boundaries of the logical page, which has specified characteristics, such as size, shape, orientation, and offset. See also form and physical page.

## M

**Mixed Object Document Content Architecture (MO:DCA)**
An architected, device-independent data stream for interchanging documents.

**Mixed Object Document Content Architecture for Presentation (MO:DCA-P)**
The subset of MO:DCA that defines presentation documents. ACIF supports MO:DCA Presentation Interchange Set data streams.

**MO:DCA**
See Mixed Object Document Content Architecture.

**MO:DCA AFP/Archive (MO:DCA AFP/A)**
An AFP document architecture interchange set that is used for long-term preservation and retrieval. This subset ensures page independence and eliminates images without clearly specified resolution, device default fonts, and external resources.

**MO:DCA AFP/A**
See MO:DCA AFP/Archive.

**MO:DCA AFP/A, IS/3**
An AFP document architecture interchange set that complies with the rules and restrictions of both the AFP/Archive and IS/3 interchange sets.

**MO:DCA data**
Print data that has been composed into pages. Text-formatting programs (such as DCF) can produce composed text data consisting entirely of structured fields. ACIF or AFP Download Plus can transform line data or XML data to MO:DCA data.

**MO:DCA GA**
See MO:DCA Graphic Arts Function Set.

**MO:DCA Graphic Arts Function Set (MO:DCA GA)**
An extension of MO:DCA IS/3 that provides support for PDF presentation object containers.

**MO:DCA IS/1**
See MO:DCA Presentation Interchange Set 1.

**MO:DCA IS/3**
See MO:DCA Presentation Interchange Set 3.

**MO:DCA-P**
See Mixed Object Document Content Architecture for Presentation.

**MO:DCA Presentation Interchange Set 1 (MO:DCA IS/1)**
A subset of MO:DCA that defines an interchange format for presentation documents.

**MO:DCA Presentation Interchange Set 3 (MO:DCA IS/3)**
A subset of MO:DCA that defines an interchange format for presentation documents. The MO:DCA IS/3 data stream includes structured fields that are not found in MO:DCA IS/1.

**Multiple Virtual Storage (MVS)**
An IBM operating system that accesses multiple address spaces in virtual storage.

**MVS**
See Multiple Virtual Storage.

## O

**object**
In AFP architecture, a collection of structured fields, bounded by a begin-object function and an end-object function. The object can contain other structured fields containing data elements of a particular type. Examples of objects are text, fonts, graphics, images, and bar codes.

**object container**
A MO:DCA structure that carries object data, which might or might not be defined by a presentation architecture.

**offset**
The number of measuring units from an arbitrary starting point to some other point.

**OpenType font**
An extension of the TrueType font format that adds support for PostScript outlines and more support for international character sets and advanced typographic control.

**orientation**
In printing, the number of degrees an object is rotated relative to a reference; for example, the orientation of an overlay relative to the logical page origin, or the orientation of printing on a page relative to the page coordinates. Orientation typically applies to blocks of information, whereas character rotation applies to individual characters. See also character rotation.

**OS/400**
Pertaining to the IBM licensed program that can be used as the operating system for System i servers prior to Version 5 Release 3. See IBM i.

**outline font**
A font whose graphic character shapes are defined by mathematical equations rather than by raster patterns. See also raster font.

**overlay**

1. A resource object that contains predefined presentation data, such as text, image, graphics, and bar code data, that can be merged with variable data on a page or form while printing.
2. The final representation of a collection of predefined presentation data on a physical medium.

## P

**page**

1. A collection of data that can be printed on one side of a sheet of paper or a form.
2. A data stream object delimited by a Begin Page structured field and an End Page structured field. A page can contain presentation data such as text, image, graphics, and bar code data. See also logical page and physical page.

**page definition**
An AFP resource object used by PSF that defines the rules for transforming line data and XML data into MO:DCA data and text controls, such as width of margins and text orientation.

**page segment**
An AFP resource object containing text, image, graphics, or bar code data that can be positioned on any addressable point on a page or an electronic overlay.

**parameter**
A value or reference passed to a function, command, or program that serves as input or controls actions. The value is supplied by a user or by another program or process.

**partitioned data set (PDS)**
A data set in direct-access storage that is divided into partitions, called members, each of which can contain a program, part of a program, or data. See also sequential data set.

**PDS**
See partitioned data set.

**physical page**
A single surface (front or back) of a form. See also form, logical page, and page.

**pitch**
A unit of measurement for the width of type (or a printed character), based on the number of characters that can be set (or printed) in one linear inch; for example, 10-pitch has 10 characters per inch. Uniformly spaced fonts are measured in pitch. See also point.

**point**
A unit of measurement used mainly for describing type sizes. Each pica has 12 points, and an inch has approximately 72 points. See also pitch.

**point size**
The height of a font in points.

**PostScript**
A page description language developed by Adobe Systems, Incorporated that describes how text and graphics are presented on printers and display devices.

**Presentation Text Object Content Architecture (PTOCA)**
An architecture that provides a collection of constructs used to interchange and present presentation text data, such as printing text data on a page, page segment, or overlay.

**print data set**
A data set created by an application program that contains the actual information to be printed and, optionally, some of the data that controls the format of the printing. The types of print data sets are composed text, line format, XML data, and mixed format. See also print file.

**Printer Control Language (PCL)**
The Hewlett Packard page description language that is used in laser and ink-jet printers.

**print file**
A file that is created for the purpose of printing data. A print file includes information to be printed and, optionally, some of the data that controls the format of the printing. See also print data set.

**Print Services Facility (PSF)**
An IBM licensed program that manages and controls the input data stream and output data stream required by supported page printers. PSF is supported under z/OS, VSE, VM, and IBM i operating systems.

**program temporary fix (PTF)**
For System i, System p, and IBM Z products, a package containing individual or multiple fixes that is made available to all licensed customers. A PTF resolves defects and might provide enhancements.

**PSF**
See Print Services Facility.

**PTOCA**
See Presentation Test Object Content Architecture.

## R

**raster font**
A font in which the characters are defined directly by the raster bit map. See also outline font.

**RAT**
See resource access table.

**record format line data**
A form of line data where each record is preceded by a 10-byte identifier. See also line data.

**regular expression**
A pattern that is used to match characters in a string.

**resource**
A collection of printing instructions used, in addition to the print data set, to produce the printed output. Resources include coded fonts, font character sets, code pages, page segments, overlays, form definitions, and page definitions.

**resource access table (RAT)**
An array of data that is used to map a resource name specified in the MO:DCA data stream to information used to find and process the resource on a given system.

**resource object**
In AFP, a collection of printing instructions, and sometimes data to be printed, that consists entirely of structured fields. A resource object is stored as a member (or file) of a library and can be called for by PSF when needed. The different resource objects include: coded font, font character set, code page, page segment, overlay, form definition, and page definition. See also library member.

**rotation**
The number of degrees a graphic character is turned relative to the page coordinates. See character rotation. See also orientation.

## S

**sequential data set**
A data set whose records are organized on the basis of their successive physical positions, such as on magnetic tape. See also partitioned data set.

**sheet**
A division of the physical medium; multiple sheets can exist on a physical medium. For example, a roll of paper might be divided by a printer into rectangular pieces of paper, each representing a sheet. Envelopes are an example of a physical medium that comprises only one sheet. The IPDS architecture defines four types of sheets: cut-sheets, continuous forms, envelopes, and computer output on microfilm. Each type of sheet has a top edge. A sheet has two sides, a front side and a back side. See also form.

**structured field**

1. A self-identifying string of bytes and its data or parameters.
2. A mechanism that permits variable length data to be encoded for transmission in the data stream.

**syntax**
The rules for the construction of a command or statement.

## T

**tag**
A type of structured field used for indexing in an AFP document. Tags associate an index attribute-value pair with a specific page or group of pages in a document.

**text orientation**
A description of the appearance of text as a combination of print direction and character rotation.

**traditional line data**
A form of line data that is prepared for printing on a line printer. See also line data.

**trigger**
Data values that are used to delineate the beginning and ending of a new group of pages. The first trigger is then the anchor point from which defined index values are located. See also anchor point.

**TrueType font**
A font format based on scalable outline technology in which the graphic character shapes are based on quadratic curves. The font is described with a set of tables contained in a TrueType font file.

**typeface**
All characters of a single type family or style, weight class, width class, and posture, regardless of size. An example is Helvetica bold condensed italic, in any point size. See also font.

## U

**Unicode**
A character encoding standard that supports the interchange, processing, and display of text that is written in the common languages around the world, plus some classical and historical texts. For example, the text name for $ is *dollar sign* and its numeric value is X'0024'. The Unicode standard has a 16-bit character set defined by ISO 10646.

## V

**virtual machine (VM)**
An instance of a data-processing system that appears to be at the exclusive disposal of a single user, but whose functions are accomplished by sharing the resources of a physical data-processing system.

**Virtual Storage Extended (VSE)**
A system that consists of a basic operating system (VSE/Advanced Functions), and any IBM supplied and user-written programs required to meet the data processing needs of a user. VSE and the hardware that it controls form a complete computing system. Its current version is called VSE/ESA.

**VM**
See virtual machine.

**VSE**
See Virtual Storage Extended.

## W

**Workbench Viewer**
See AFP Workbench Viewer.

## X

**XML data**
Data identified with the Extensible Markup Language (XML), which is a standard metalanguage for defining markup languages that is based on Standard Generalized Markup Language (SGML). For printing on page printers, a page definition is required to provide the data placement and presentation information. The XML data processed by ACIF can be encoded in EBCDIC, ASCII, UTF-8 or UTF-16.

## Z

**z/OS**
An IBM mainframe operating system that uses 64-bit real storage.

# Bibliography

This bibliography lists the titles of publications containing additional information about PSF, AFP, the z/OS operating system, and related products.

The titles and order numbers might change from time to time. To verify the current title or order number, consult your IBM marketing representative.

You can obtain many of the publications listed in this bibliography from the AFP Consortium Publications (afpcinc.org/publications) and the z/OS Internet Library (www.ibm.com/servers/resourcelink/svc00100.nsf/pages/zosInternetLibrary).

## Advanced Function Presentation (AFP)

| **Publication** | **Order Number** |
|---|---|
| *Advanced Function Presentation: Programming Guide and Line Data Reference* | S544-3884 |
| *AFP Consortium: AFP Color Management Architecture (ACMA)* | AFPCC |
| *AFP Toolbox User's Guide* | S544-5292 |
| *Bar Code Object Content Architecture Reference* | AFPC-0005 |
| *Color Management Object Content Architecture Reference* | AFPC-0006 |
| *Font Object Content Architecture Reference* | AFPC-0007 |
| *Graphics Object Content Architecture for AFP Reference* | AFPC-0008 |
| *Guide to Advanced Function Presentation* | G544-3876 |
| *IBM AFP Fonts: Font Summary for AFP Font Collection* | S544-5633 |
| *IBM Infoprint Fonts: Font Summary* | G544-5846 |
| *Image Object Content Architecture Reference* | AFPC-0003 |
| *Intelligent Printer Data Stream Reference* | AFPC-0001 |
| *Mixed Object Document Content Architecture Reference* | AFPC-0004 |
| *Overlay Generation Language/370 User's Guide and Reference* | S544-3702 |
| *Presentation Text Object Content Architecture Reference* | AFPC-0009 |
| *Using OpenType Fonts in an AFP System* | G544-5876 |
| *z/OS Font Collection* | GA32-1048 |

## Text Processing

| **Publication** | **Order number** |
|---|---|
| *Document Composition Facility: SCRIPT/VS Language Reference* | SH35-0070 |

# Index

## A

accessibility
- contact IBM 235
- features 235

ACIF JCL statement, z/OS 16
AFP Conversion and Indexing Facility (ACIF)
- AFP data as input to 2
- AFP Toolbox 12
- AFP Workbench Viewer 11
- application, example of using 84
- converting data streams 2
- Document Composition Facility (DCF) 13
- document files, viewing 94
- enhanced indexing parameters 67
- enhanced indexing, example of using 94
- functions 2
- indexing functions 4
- invoking in
  - VM 17
  - VSE 18
  - z/OS 15
- messages 109
- output file format 232
- overview 1
- parameters 21
- preparing files for
  - archiving and retrieval 10
  - printing 9
  - viewing 8
- processing parameters
  - examples of 81
  - specifying 87
- related IBM products 11
- retrieving resources 7
- running jobs 93
- scenarios 8
- syntax rules 21
- understanding 1
- user exits 99
- using 15

AFP data stream as input 3
AFP Toolbox 12
AFP Workbench Viewer
- description of 12
- fonts used to display documents 12
- group names used by 45
- indexing for 47
- preparing files for viewing with 8
- retrieving resources for 62
- viewing document files with 94

AIX, transferring files to 209
anchor point, definition of 6
anchor record
- FIELDn parameter 40, 69
- set by INDEXn parameter 45, 75
- set by TRIGGERn parameter 63, 77

ANSI carriage-control characters
- ASCII, encoded in 32
- EBCDIC, encoded in 32
- indexing considerations 211
- LINEOFFSET 50
- machine code 32
- specifying 31
- type of, specifying 32
- using 208

APKACIF
- CMS statement, VM 17
- JCL statement, VSE 19

archiving
- indexing considerations 210, 211
- indexing data for 4
- preparing files for 10
- retrieving resources for 7

ASCII
- data, literal values for 87
- encoded carriage control characters 32
- parameter file for input data 87

assistive technologies 235
attribute name for indexing, specifying 45, 75
attributes
- indexing 45, 75
- print file 106

## B

BDI structured field 226
BDT structured field 231
Begin Document (BDT) structured field 231
Begin Document Index (BDI) structured field 226
Begin Named Group (BNG) structured field 231
Begin Page (BPG) structured field 232
Begin Print File (BPF) structured field 222
Begin Resource (BRS) structured field 221
Begin Resource Group (BRG) structured field 221
blank characters in parameter file 21
BNG structured field 231
BPG structured field 232
BR structured field 221
BREAKYES parameter 68
BRG structured field 221
BRS structured field 221

## C

carriage-control characters
- ASCII, encoded in 32
- EBCDIC, encoded in 32
- indexing considerations 211
- LINEOFFSET 50
- machine code 32
- specifying 31
- type of, specifying 32
- using 208

CC parameter
  format 31
  print file attribute 107
CCTYPE parameter
  format 32
  print file attribute 107
CHARS parameter
  format 32
  print file attribute 107
  TRCs, font order 63
CMRs
  processing 215
  specified with RESTYPE 61
CMS commands
  concatenating VM files with 94
  for ACIF jobs 17
  VM parameter file 89
code page identifier 35
code page identifiers for Unicode data 211
coded fonts for MCF-2 structured fields 105
color management resources
  processing 215
  specified with RESTYPE 61
color mapping table
  in the resource file 105
  inline resource requirements 34
  parameter 33
COLORMAP parameter 33
COM setup file
  in OBJCONLIB 51, 65
  in the resource file 105
  inline resource requirements 34
  specified in setup parameter 34
comments in parameter file 21
Composed Text Control (CTC) structured field 232
COMSETUP parameter 34
concatenation
  resource group to document 214
  VM files 94
  z/OS files 93
constant fields 70
contact
  z/OS 235
control statements with numbered lines 207
conventions, syntax 21
converting
  data streams 2
  line or XML data, example 81
CPGID parameter 35
CTC structured field 232

## D

data fields, specifying 40, 69
data sets, specifying
  extended code page font 42, 65
  FOCA font 42, 65
  form definition 39
  object container 51
  overlay 53
  page definition 56
  page segment 57
  user 65
data streams, converting 2
data values, indexing with 5
DCB requirements
  index object file 47
  on INDEX JCL statement 16
  on OUTPUT JCL statement 16
  on RESOBJ JCL statement 16
  output file 52
  resource file 59
DCBS characters, processing 16
DCF, adding indexing tags 13
DCFPAGENAMES parameter 35
DD statement
  VM 17
  z/OS 15
directories
  example of locating 83
  extended code page font 43, 66
  resource
    example of locating 83
    locations of 92
  TrueType and OpenType font 43, 66
distributed printing
  limitations 13
  preparing files for 9
DLBL statements for VSE 18
Document Composition Facility, adding indexing tags 13
document files
  creating 93
  indexing 4
  transferring to workstations 94
document output format 229
double-byte fonts required in SOSI process 57
Download for z/OS, transferring files with 210
dummy definition
  form 43
  page 55
DUPLEX parameter 35

## E

EBCDIC
  data, literal values for 87
  encoded carriage control characters 32
  parameter file for input data 87
EDI structured field 227
EDT structured field 232
enabling ACIF 15
encoded carriage-control characters
  ASCII 32
  EBCDIC 32
End Document (EDT) structured field 232
End Document Index (EDI) structured field 227
End Named Group (ENG) structured field 232
End Page (EPG) structured field 232
End Print File (EPF) structured field 222
End Resource (ERS) structured field 221
End Resource Group (ERG) structured field 221
ENG structured field 232
enhanced indexing 67
enhanced indexing parameter file 95
environment variables
  PATH
    index record exit 48
    input record exit 48

EPG structured field 232
ER structured field 221
ERG structured field 221
error message files, naming 51
ERS structured field 221
examples
  ACIF application 84
  ACIF output for indexed input file 230
  AFP document output formats 229
  ASCII input data, parameter file for 87
  CMS commands to run ACIF 17
  drawing graphics 83
  EBCDIC input data, parameter file for 87
  enhanced indexing 94
  enhanced indexing parameter file 95
  index record exit 101
  indexing input files 90
  indexing with data values 6
  input file 85
  input record exit 100
  line data application 84
  literal values 86
  locating resource libraries 83
  output record exit 102
  print file attributes 106
  processing parameters 87
  resource exit 104
  retrieving resources 81
  specifying coded fonts 82
  specifying TrueType and OpenType fonts 82
  transforming line or XML data 81
  using ACIF 81
  UTF-16 input data, parameter file for 97
  VM parameter file 89
  VSE JCL to run ACIF 18
  VSE parameter file 89
  z/OS JCL to run ACIF 15
  z/OS parameter file 87
exits
  index record 48, 101
  input record 48, 99
  nonzero return codes 99
  output record 52, 102
  print file attributes provided 106
  provided with ACIF
    index record 101
    input record 99
    output record 102
    resource 103
  resource
    naming 58
    overview 103
  search order 106
  user programming 99
EXTENSIONS parameter 36

## F

FDEFLIB parameter 39
feedback xxi
FIELDn parameter
  format 40, 69
  specified in multiple INDEXn parameters 46, 76
  specifying with indexing data 91
fields
  constant 70
  data, specifying 40, 69
  indexing 46, 76
  inserting IMM structured 49
  mask 73
  specifying MCF-2 structured 50
  specifying with indexing data 91
  transaction 71
  trigger 69
files
  preparing for
    archiving and retrieval 10
    printing 9
    viewing 8
  transferring to AIX or Windows 209
  viewing document 94
FONTECH parameter 41
FONTLIB parameter 41
FONTPATH parameter 43
fonts
  3800 41
  double-byte requirements in SOSI process 57
  example of specifying coded 82
  example of specifying TrueType and OpenType 82
  FOCA, naming conventions 232
  for line data 33
  libraries for extended code page 41, 43, 65, 66
  libraries for FOCA 41, 65
  libraries for TrueType and OpenType 43, 66
  naming conventions for FOCA 232
  specifying with CHARS 32
  TRC assignment 63
  unbounded box 41
  used by AFP Workbench Viewer 12
form definition
  inline resource requirements 44
  libraries 39
  specified with FORMDEF 43
  specifying 92
FORMDEF parameter
  format 43
  print file attribute 107
FTP, transferring files with 94, 209

## G

group name, unique 65
group-level IEL structured field 225
GROUPMAXPAGES parameter 75
GROUPNAME parameter 45
groups for indexing
  definition of 4
  GROUPMAXPAGES parameter 75
  GROUPNAME parameter 45
  structured fields 221, 231
groups, page 230
GTF trace 62

## I

ICONV translation services, enabling 16
IEL structured field

IEL structured field *(continued)*
  group-level 225
  index object file 210
  page-level 226
  triplets composing 226
IMAGEOUT parameter
  format 45
  hints for specifying 215
IMM structured field
  hints for creating 210
  inserting 49
INDEX
  CMS statement, VM 17
  parameter 45, 75
  specifying for indexing 91
  VSE JCL statement 19
  z/OS JCL statement 16
Index Element (IEL) structured field
  group-level 225
  index object file 210
  page-level 226
  triplets composing 226
index object file
  archiving considerations 211
  creating 93
  DCB characteristics 47
  defining for
    VM 17
    VSE 19
    z/OS 16
  description of 4
  naming 46
  structured fields 225
  type of information in 47
  used by AFP Workbench Viewer 12
index record exit
  examples 101
  naming 48
  overview 101
INDEXDD parameter 46
indexing
  ACIF application, tasks for 84
  anchor point, definition of 6
  anchor record 40, 63, 69, 77
  description of 4
  effect on document 229
  enhanced 67
  example 90
  FIELDn parameter 40, 69
  functions 4
  helpful hints 210
  input files 5
  limitations 7
  page ACIF should start 48
  page-level information 77
  parameter 45, 75
  record exit 101
  structured fields 219
  TLE structured field 219
  trigger parameter 63, 77
  triggers, definition of 6
  with data values 5
  with DCF 13
  with literal values 5
indexing tags
  definition of 4
  End Resource Group structured field 221
  End Resource structured field 221
  example 91
  INDEXn parameter 45, 75
  structured fields 221
INDEXn parameter 45, 75
INDEXOBJ parameter 47
INDEXSTARTBY parameter 48
INDXEXIT parameter 48
inline resources
  color mapping tables 34
  COM setup files 34
  form definition 44
  order of 215
  page definition 55
  processing 215
  specified with RESTYPE 61
INPEXIT parameter 48
INPUT
  CMS commands, VM 17
  VSE JCL statement 19
  z/OS JCL statement 16
input data streams
  processing 2
input file
  example 85
  exit 99
  indexing 90
  naming 48
input print file 106
input record exit
  examples 100
  naming 48
  overview 99
INPUTDD parameter 48
INSERTIMM parameter 49
Invoke Medium Map (IMM) structured field
  hints for creating 210
  inserting 49

## J

JCL
  enhanced indexing parameter file 95
  for concatenating z/OS files 93
  for VSE jobs 18
  for z/OS jobs 15
  statements
    VSE 18
    z/OS 15
  VSE parameter file 89
  z/OS parameter file 87

## K

keyboard
  navigation 235
  PF keys 235
  shortcut keys 235

## L

libraries
- example of locating 83
- extended code page font 41, 43, 65, 66
- FOCA font 41, 65
- form definition 39
- object container 51
- overlay 53
- page definition 56
- page segment 57
- resource
  - example of locating 83
  - locations of 92
- TrueType and OpenType font 43, 66
- user 65

limitations
- indexing 7
- printing 13

line data
- as input 3
- carriage controls 32
- fonts 33
- input to ACIF indexing 5
- search paths for resources
  - extended code page fonts 41, 43, 65, 66
  - FOCA fonts 41
  - form definitions 39
  - overlays 53
  - page definitions 56
  - page segments 57
  - TrueType and OpenType fonts 43, 66
  - user resources 65

LINEOFFSET parameter 50

literal values
- determining how expressed 86
- indexing with 5

locations of resources libraries, identifying 92

## M

machine code carriage control characters 32

Map Coded Font Format 1 (MCF-1) structured field 232

Map Coded Font Format 2 (MCF-2) structured field
- coded fonts 105
- modification 232
- specifying 50

mask fields 73

MCF-1 structured field 232

MCF-2 structured field
- coded fonts 105
- modification 232
- specifying 50

MCF2REF parameter 50

members, partitioned data set
- preparing for
  - archiving and retrieval 10
  - printing 9
  - viewing 8
- transferring to AIX or Windows 209
- viewing document 94

message files
- creating 93
- defining for

message files *(continued)*
- defining for *(continued)*
  - VM 18
  - VSE 19
  - z/OS 16
- naming, error 51

messages
- ACIF 109

mixed-mode data as input 4

MO:DCA-P data stream as input 3

MO:DCA-P object containers, creating 215

MSGDD parameter 51

multiple-up output from page definition 211

MVSICNV, setting up to use 16

## N

named groups, placing TLEs in 207

naming conventions for FOCA fonts 232

navigation
- keyboard 235

No Operation (NOP) structured field 222

nonzero return codes 99

numbered lines in control statements 207

## O

OBJCONLIB parameter 51

OBJCPATH parameter 52

object containers, creating MO:DCA-P 215

OpenType fonts, specifying 82

order of inline resources 215

out-of-storage problem, possible cause 207

OUTEXIT parameter 52

OUTPUT
- CMS commands, VM 17
- VSE JCL statement 19
- z/OS JCL statement 16

output files
- creating 93
- format 229
- MO:DCA-P data stream 232
- naming 52
- processing inline resources to 215

output record exit
- examples 102
- naming 52
- overview 102

OUTPUTDD parameter 52

overlay library 53

overview of ACIF 1

OVLYLIB parameter 53

## P

page definition
- excluded from resource file 233
- fonts 32
- inline resource requirements 55
- libraries 56
- multiple-up output 211
- specified with PAGEDEF 54
- specifying 92

page groups 230
page segment library 57
page-level
  IEL structured field 226
  information, indexing 77
PAGEDEF parameter
  format 54
  print file attribute 107
parameter files
  ASCII input data, example of 87
  blank characters in 21
  comments in 21
  creating output files with 93
  defining
    for VM 18
    for z/OS 16
    resource libraries 92
  determining form and page definitions 92
  EBCDIC input data, example of 87
  enhanced indexing, example of 95
  examples of 87
  specifying 87
  syntax rules 21
  using to run ACIF jobs 93
  UTF-16 input data, example of 97
  values spanning multiple records 21
  VM, example of 89
  VSE, example of 89
  z/OS, example of 87
parameter values spanning multiple records 21
parameters
  ACIF 21
  BREAKYES 68
  CC 31
  CCTYPE 32
  CHARS 32
  COLORMAP 33
  COMSETUP 34
  CPGID 35
  DCFPAGENAMES 35
  DUPLEX 35
  enhanced indexing 67
  EXTENSIONS 36
  FDEFLIB 39
  FIELDn 40, 69
  FONTECH 41
  FONTLIB 41
  FONTPATH 43
  FORMDEF 43
  GROUPMAXPAGES 75
  GROUPNAME 45
  IMAGEOUT 45
  INDEXDD 46
  INDEXn 45, 75
  INDEXOBJ 47
  INDEXSTARTBY 48
  INDXEXIT 48
  INPEXIT 48
  INPUTDD 48
  INSERTIMM 49
  LINEOFFSET 50
  MCF2REF 50
  MSGDD 51
  OBJCONLIB 51
parameters *(continued)*
  OBJCPATH 52
  OUTEXIT 52
  OUTPUTDD 52
  OVLYLIB 53
  PAGEDEF 54
  PARMDD 56
  PDEFLIB 56
  PRMODE 57
  PSEGLIB 57
  RESEXIT 58
  RESFILE 59
  RESOBJDD 59
  RESTYPE 60
  syntax rules 21
  TRACE 62
  TRACEDD 63
  TRC 63
  TRIGGERn 63, 77
  UNIQUEBNGS 65
  USERLIB 65
  USERMASK 80
  USERPATH 66
  values for 22
  values for enhanced indexing 67
PARMDD parameter 56
partitioned data sets, definition of 7
PATH environment variable
  index record exit 48
  input record exit 48
paths
  extended code page font directory 43, 66
  TrueType and OpenType font directory 43, 66
PC file transfer program, transferring files with 209
PDEFLIB parameter 56
physical media, transferring files with 209
PRD2 JCL statement, VSE 19
prerequisites, system 13
Presentation Text Data Descriptor (PTD) structured field 233
print file attributes
  provided to exits 106
  user exits 99
printing
  limitations 13
  preparing files for 9
PRINTOUT JCL statement, z/OS 15
PRMODE parameter
  format 57
  print file attribute 107
PRNTOUT JCL statement, VSE 18
processing
  inline resources 215
  mode 57
processing parameters
  ASCII input data 87
  EBCDIC input data 87
  specifying 87
  UTF-16 input data 97
programming interface information
  AFP Toolbox 12
PSEGLIB parameter 57
PTD structured field 233
PTOCA objects, processing 16
publications, related 255

## Q

QR Code bar codes, processing 16

## R

record format page definitions, drawing graphics with 83
regular expressions
- enabling 16
- FIELDn parameter 72
- helpful hints 212
- TRIGGERn parameter 78

related products 11
related publications 255
RESEXIT parameter 58
RESFILE parameter 59
RESOBJ
- CMS statement, VM 17
- JCL statement
  - VSE 19
  - z/OS 16

RESOBJDD parameter 59
resource exit
- examples 104
- filtering resources 8
- naming 58
- overview 103

resource files
- AFP data stream resource group 8
- creating 93
- DCB characteristics 59
- defining for
  - VM 17
  - VSE 19
  - z/OS 16
- format 223
- naming 59
- output format 7
- partitioned data set, z/OS 7
- processing inline resources to 215
- structured fields 221
- type created 59
- type of resources retrieved for 60

resource libraries
- example of locating 83
- locations of 92

resource retrieval
- description of 7
- example 81
- exit program 58
- exit, overview 103
- file format 223
- file type created 59
- type included 60

RESTYPE parameter
- format 60
- specifying resources for retrieval 7

retrieval, preparing files for 10
return codes, nonzero 99

## S

sample code
sample code *(continued)*
- ACIF application 84
- ACIF output for indexed input file 230
- AFP document output formats 229
- ASCII input data, parameter file for 87
- CMS commands to run ACIF 17
- drawing graphics 83
- EBCDIC input data, parameter file for 87
- enhanced indexing 94
- enhanced indexing parameter file 95
- index record exit 101
- indexing input files 90
- indexing with data values 6
- input file 85
- input record exit 100
- line data application 84
- literal values 86
- locating resource libraries 83
- output record exit 102
- print file attributes 106
- processing parameters 87
- resource exit 104
- retrieving resources 81
- specifying coded fonts 82
- specifying TrueType and OpenType fonts 82
- transforming line or XML data 81
- using ACIF 81
- UTF-16 input data, parameter file for 97
- VM parameter file 89
- VSE JCL to run ACIF 18
- VSE parameter file 89
- z/OS JCL to run ACIF 15
- z/OS parameter file 87

search order
- user exits 106

search paths for
- extended code page fonts 41, 43, 65, 66
- FOCA fonts 41
- form definitions 39
- object container files 51
- overlays 53
- page definitions 56
- page segments 57
- TrueType and OpenType fonts 43, 66
- user resources 65

sending to IBM
- reader comments xxi

separator pages, removal from output 211
sequential data sets
- preparing for
  - archiving and retrieval 10
  - printing 9
  - viewing 8
- transferring to AIX or Windows 209
- viewing document 94

setup file
- location of 51
- name 34

shortcut keys 235
SOSI processing 57
storage problem, possible cause 207
structured fields
- Begin Document 231
- Begin Document Index 226

structured fields *(continued)*
  Begin Named Group 229, 231
  Begin Page 232
  Begin Print File 222
  Begin Resource 221
  Begin Resource Group 221
  Composed Text Control 232
  End Document 232
  End Document Index 227
  End Named Group 229, 232
  End Page 232
  End Print File 222
  End Resource 221
  End Resource Group 221
  Index Element
    group-level 225
    index object file 210
    page-level 226
    triplets composing 226
  inserted in index object file 4
  Invoke Medium Map
    hints for creating 210
    inserting 49
  Map Coded Font Format 1 232
  Map Coded Font Format 2
    coded fonts 105
    modification 232
    specifying 50
  No Operation 222
  Presentation Text Data Descriptor 233
  Tag Logical Element 210, 219, 227, 229, 231
syntax rules for parameter files 21
SYS1.PARMLIB member, setting up 15
SYSIN JCL statement, z/OS 16
SYSPRINT JCL statement, z/OS 16
system resource libraries
  example of locating 83

## T

table reference characters 63
Tag Logical Element (TLE) structured field
  created in the output document file 229
  examples and rules 219
  in indexing process 227, 231
  in named groups 207
  index object file 210
tags for indexing
  definition of 4
  example 91
  INDEXn parameter 45, 75
  structured fields 221
tasks for ACIF application 84
TLE structured field
  created in the output document file 229
  examples and rules 219
  in indexing process 227, 231
  in named groups 207
  index object file 210
TRACE parameter 62
TRACEDD parameter 63
transaction fields 71
transferring files
  to AIX or Windows 209
transferring files *(continued)*
  to workstations, example of 94
TRC parameter
  format 63
  print file attribute 107
trigger fields 69
TRIGGERn parameter 63, 77
triggers for indexing
  definition of 6
  set by TRIGGERn parameter 63, 77
  specifying 91
  used with FIELDn parameter 40, 69
  used with INDEXn parameter 45, 75
TrueType fonts, specifying 82

## U

understanding ACIF 1
Unicode data, code page identifiers 211
UNIQUEBNGS parameter 65
user exits
  index record 48, 101
  input record 48, 99
  nonzero return codes 99
  output record 52, 102
  print file attributes provided 106
  provided with ACIF, sample 99
  resource, overview 103
  search order 106
  specified with RESEXIT 58
user interface
  ISPF 235
  TSO/E 235
user library
  fonts 33
  form definitions 44
  page definitions 55
  requesting access to 65
user programming exits, provided with ACIF 99
USERAPPL
  CMS command, VM 17
  JCL statement
    VSE 18
    z/OS 15
USERLIB parameter 65
USERMASK parameter 80
USERPATH parameter 66
using ACIF
  examples of 81
  in VM 17
  in VSE 18
  in z/OS 15
  running jobs 93
  scenarios for 8
  to prepare files for
    archiving and retrieval 10
    printing 9
    viewing 8
UTF-16 input data 97

## V

values for enhanced indexing parameters 67

values for parameters 22
VARIABLE option when processing resource objects 16
Viewer application of AFP Workbench
  description of 12
  fonts used to display documents 12
  group names used by 45
  indexing for 47
  preparing files for viewing with 8
  retrieving resources for 62
  viewing document files with 94
viewing
  concatenated document files 94
  indexing data for 4
  preparing files for 8
  retrieving resources for 7
  tasks for 84
  with AFP Workbench Viewer 11
VM
  CMS commands to run ACIF 17
  concatenating output files 94
  DD statement for document file 17
  examples
    CMS commands to run ACIF 17
    drawing graphics 83
    locating resource libraries 83
    parameter file 89
    resource retrieval 81
    specifying fonts 82
    transforming line or XML data 81
  message file, defining 18
  parameter file 18
  search order, user exit load modules 106
  syntax rules for ACIF 22
  system prerequisites 13
  using ACIF 17
VSE
  examples
    drawing graphics 83
    JCL to run ACIF 18
    locating resource libraries 83
    parameter file 89
    resource retrieval 81
    specifying fonts 82
    transforming line or XML data 81
  JCL statement to run ACIF 18
  message file, defining 19
  parameters 19
  search order, user exit load modules 106
  syntax rules for ACIF 22
  system prerequisites 14
  using ACIF in 18

## W

Windows, transferring files to 209
Workbench, Viewer application
  description of 12
  fonts used to display documents 12
  group names used by 45
  indexing for 47
  preparing files for viewing with 8
  retrieving resources for 62
  viewing document files with 94
workstations
workstations *(continued)*
  transferring document files to 94

## X

XML data 4

## Z

z/OS
  concatenating output files 93
  DD statement for document file 15
  enhanced indexing 67
  examples
    drawing graphics 83
    enhanced indexing parameter file 95
    JCL to run ACIF 15
    locating resource libraries 83
    parameter file 87
    resource retrieval 81
    specifying coded fonts 82
    specifying TrueType and OpenType fonts 82
    transforming line or XML data 81
  message file, defining 16
  parameter file
    defining 16
    for enhanced indexing 95
    JCL for 87
  partitioned data set, definition of 7
  search order, user exit load modules 106
  syntax rules for ACIF 22
  system prerequisites 13
  using ACIF in 15

S550-0436-05