

# *Section Four:*

## *Printing Documents with XPAF*

This section provides the information you need to know in order to print documents through XPAF. For each supported type of document, it addresses these topics:

- Preparing and using resources
- Modifying document processing and format
- Using advanced features, such as color
- Converting data streams to other formats
- Troubleshooting printing problems

Before you begin to use XPAF's printing facilities, verify that XPAF has been installed and that the IVPs can be run successfully.

As the systems or application programmer responsible for printing documents through XPAF, you should be familiar with the IBM MVS JCL concepts needed to code and submit jobs successfully (for example, you must use standard JCL syntax).





## 30. General information

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This chapter explains how XPAF determines the processing mode for a document after it is submitted for printing, and how XPAF uses system-level features, such as banner pages and user exits, which were set up at installation time. In addition, it explains how to:

- Change the processing mode for a document
- Print pass-through documents to PCL-capable printers
- Download resources to a printer independently of any document

### *How does XPAF select the document processing mode?*

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Whenever you print a document, XPAF must examine the inbound data to determine what type of document has been submitted. During dataset open processing, XPAF examines the data and assigns a document type.

#### *Document types*

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XPAF classifies each document it processes as belonging to one of six types: NM, DJDE, JCL, XES, PCL5, AFPX, or AFPA. This section describes each document type and how it is selected.

**NM** Indicates a native mode (printer-ready) document. If a document is created and submitted without any extended JCL keywords, DJDE packets, XES criteria, or AFP attributes, then XPAF will process it as native mode.

**DJDE** Indicates a DJDE document. If a document includes one or more of these characteristics, then XPAF will process it as DJDE mode:

- The keyword PRMODE=DJDE is specified on the OUTPUT statement in the JCL.
- The first record in the data stream contains a valid IDEN, and that IDEN matches the IDEN value specified in the initialization parameter.

For any dataset that contains DJDE extended JCL keywords or a valid IDEN in the first data record, XPAF assumes DJDE processing even if PRMODE=LINE. However, if any AFP attributes are associated with the document, then AFP mode will override DJDE mode.

**JCL** Indicates a document that uses extended JCL keywords. If a document includes one or more extended JCL keywords, XPAF will process it as JCL mode. However, if any AFP attributes are associated with the document, then AFP mode will override JCL mode.




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**NOTE:** JCL type is equivalent to DJDE because XPAF uses the extended JCL keyword values to build DJDEs for the outbound data stream destined for a Xerox printer.

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**XES** Indicates an XES document. If a document includes one or more of these characteristics in the first record, then XPAF will process it as XES mode:

- It includes a X'27' carriage control value.
- It includes the '=UDK=' character string.

If any AFP attributes are associated with the document, then AFP mode will override XES mode.

**AFPX** Indicates a page-formatted document. Refer to the description of AFPA below. Although page-formatted and AFP documents are two different types of data streams, XPAF uses the same code for converting each type of document to a format supported by Xerox printers. Therefore, this explanation uses the term "AFP attributes" to refer to characteristics that may apply to either page-formatted or AFP documents.

**AFPA** Indicates an AFP document. If a document includes one or more of these characteristics, XPAF will process it as AFP:

- Any record within the data stream includes a X'5A' carriage control value.
- The keywords FCB and/or UCS are included on the DD statement in the JCL.
- The keywords CHARS, FCB, FORMDEF, PAGEDEF, PRMODE=PAGE, and/or UCS are included on the OUTPUT statement in the JCL.

For any dataset that contains AFP extended JCL keywords or contains a 5A carriage control in the first data record, XPAF assumes AFP processing, no matter what value has been specified for the PRMODE.

## *Processing hierarchy*

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AFP attributes take precedence over all other document characteristics. If a document contains any AFP attributes, then it will be processed as AFP, regardless of any other factors. For example, if a document contains embedded DJDEs, but the DD statement in the JCL specifies PAGEDEF=A06420, then XPAF will process the document as AFP. The DJDEs will be printed as data and not interpreted as DJDEs.

## *AFP processing exceptions*

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Certain conditions can alter the standard processing type hierarchy:

- If SYSFCB=\*\*\*\* is coded in the XINSXOSF member of XINPARM, XPAF discards the value specified by either the PAGEDEF or FCB IBM JCL keyword.
- If SYSFLSH=\*\*\*\* is coded in the XINSXOSF member of XINPARM, XPAF discards the value specified by the FLASH IBM JCL keyword.
- If SYSFONT=\*\*\*\* is coded in the XINSXOSF member of XINPARM, XPAF discards the value specified by either the CHARS or UCS IBM JCL keyword.

Depending on the document, these values can disable AFP processing. For example, assume you submitted a document that included only one JCL keyword on the OUTPUT statement: PAGEDEF=ABCD. By definition, this would have normally caused XPAF to use AFP processing. However, because you coded SYSFCB=\*\*\*\* in the XINSXOSF member of XINPARM, XPAF discarded the PAGEDEF value. The document was then processed as native mode rather than AFP.

## *Using user exit 02 to change the processing mode*

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You can select the processing mode for a data stream by defining certain test criteria in user exit 02. You can use any of the fields available in the XDIB control block to build your test criteria and determine the desired document type. For example, you may test FORMS, CLASS, and FCB to decide if a document should be printed as native mode or AFP.

For more information on user exits and how to code them, refer to [Section Two: Installing and Customizing XPAF](#).

## Processing modes available

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You must code user exit 02 to update the XDIBDFMT field with the desired format type:

blank	XPAF determines what processing mode to use based on the extended JCL and the data stream.
NM	Forces the job through native mode processing. No extended JCL processing is provided, and no DJDE processing is provided for decentralized and PCL-capable printers.
DJDE	Forces the job through DJDE processing. No extended JCL processing is provided.
JCL	Forces the job through extended JCL processing. For decentralized printers, DJDE-to-XES processing also is included.
XES	Forces the job through XES processing to decentralized printers.
PCL5	Forces pass-through processing to PCL-capable printers.
AFPX	Forces page-formatted processing.
AFPA	Forces AFP processing.



**NOTE:** NM and DJDE processing are equivalent for centralized printers.

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## Sample user exit

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A sample user exit (XUXIT02A) is provided in XPFSAMP to demonstrate this feature.

## *Printing pass-through documents to PCL-capable printers*

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You can send a data stream specifying pass-through mode to any XPAF-supported decentralized or PCL-capable printer if the printer supports the printer command language of the data stream. (For example, the data stream for a PCL document does not require a print command conversion by XPAF before being sent to a PCL-capable printer.) Data streams which may be printed in pass-through mode include:

- HPGL
- PCL
- PostScript
- XES



**CAUTION:** If you try to print a pass-through document through XPAF to a non-Xerox printer, results will be unpredictable.

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## *Resource processing*

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XPAF does not perform any conditioning on resources included in a pass-through document. All of the information required to print the document must be contained within the data stream because the data stream is sent directly to the printer without being altered.

## *Font availability for banner pages*

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When printing banner pages for pass-through documents, XPAF uses the default font specified in the PORTFONT or LANDFONT printer profile parameter. The default fonts for PCL-capable printers are P0612A and L0112B, which are supplied in the decentralized font library. If you have changed the values for your default portrait and/or landscape fonts, you may need to update the PORTFONT and/or LANDFONT printer profile parameters to specify fonts that are available in the decentralized font library.

## *Color processing*

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The PCL emulator in Xerox printers supports color processing. Therefore, PCL pass-through documents printed through XPAF can be printed in color. If the HPGL and PostScript emulators in your Xerox printer support color, then HPGL and PostScript pass-through documents also will be printed in color.

## Printer commands

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Since XPAF performs no verification on the document, you can include any available HPGL, PCL, PostScript, or XES commands in your data stream.

However, if a pass-through data stream contains commands that are not supported by the target printer, unpredictable results may occur. For example, unpredictable results will occur if you send a document containing PCL color commands to a PCL-capable printer that does not support color.

## Document switch processing

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When printing pass-through documents through XPAF, one of two types of printer processing is performed:

- If the printer supports automatic document switch processing, then the printer automatically switches the processing mode for the current document. For example, if the printer is set in PCL mode (PCLDS=PCL5 in your extended JCL), and you send a PostScript pass-through document to the printer, the printer automatically switches the printer mode from PCL processing to PostScript processing. When the document has finished printing, the printer switches the print mode back to PCL.

Refer to your printer reference manual for specific information on automatic document switch processing.



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**NOTE:** The processing just described does not apply to pass-through Metacode and XES data streams.

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- If the printer does not support automatic document switch processing, then you must specify the appropriate data stream type in the PCLDS extended JCL keyword for the document you wish to print. You also must specify MLANG=Y in the printer's profile or via extended JCL to indicate that the printer supports automatic document switch processing via the mode change key (MCK). Then, when you send the document to the printer, XPAF will send MCK commands to the printer causing it to change to the required print mode.

## Job submission

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To print a pass-through document through XPAF, perform these steps:

- Step 1.** On the system where the pass-through document was created, print the document to disk.
- Step 2.** Upload the file from the PC or disk to the host system. Be sure to use a binary upload.



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**NOTE:** If you use any upload procedure besides binary, you may not be able to print the file.

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- Step 3.** Ensure that you have specified PCLREQ=PASS in either the printer's profile or the extended JCL to indicate that the document prints in pass-through mode.
- Step 4.** Ensure that you have specified a value for the PCLDS extended JCL keyword to indicate the type of data stream to be printed.
- Step 5.** Submit the job for printing through XPAF. Make sure you include a DD statement, similar to this one, in the JCL used to submit the job:

```
//OUTDD OUTPUT PCLDS=PCL5,PCLREQ=PASS,MLANG=Y
```



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**NOTE:** If your printer is set up for automatic document switch processing, you may omit the MLANG keyword.

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## Troubleshooting problems

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Occasionally, your output may not print as you expected. If this happens, review the items in table 30-1 for information to help you resolve the problem.

Table 30-1. Common printing errors for pass-through documents

Symptom	Explanation	Steps to take
Printer commands are printed as text.	The printer does not support the specified printer command.	<p>If an MCK command is printed, the printer does not support automatic document switch processing. Change the value specified for MLANG to N.</p> <p>If a PJJ command is printed, remove the command from the data stream.</p>
When printing pass-through documents, the output prints incorrectly.	The data stream in pass-through mode was changed by JES because blank truncation was specified.	Ensure that BLNKTRNC=NO is specified for the output class to indicate that blank truncation has not been set.

## Downloading resources

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You can download resources to a printer that supports downloading independently of any documents that may reference them. To do this, specify the REVFONT, REVFORM, REVIMAGE, and REVLOGO extended JCL keywords in the data stream.

For example, to download a form named 'INV1' and any fonts, images, or logos that it references, use JCL similar to this:

```
//job-name JOB job-information
//DOWNLD EXEC PGM=IEBGENER
//OUT OUTPUT REVFONT=*, REVFORM=*, REVIMAGE=*, REVLOGO=*
//SYSIN DD DUMMY
//SYSPRINT DD SYSOUT=*
//SYSUT2 DD SYSOUT=*, OUTPUT=*.OUT
//SYSUT1 DD *
@@@DJDE FORMS=INV1, END;
TEST RESOURCE DOWNLOAD.
/*
```

This JCL enables you to download a resource with a minimum of printed text.

## Using system-level features

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Some features that affect XPAF's processing of your documents are set up at installation. This section provides a brief description of these features to ensure that you are aware of them.

### Banner pages

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Banner pages, also known as separator pages, are issued with each print job and contain job information, such as the user ID, job ID, and print date. A banner page may be issued as a header page, a trailer page, and/or a separator page between datasets.

#### Selecting the banner page format

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XPAF uses its default format for banner pages unless your systems programmer specified another format during installation. The format of banner pages at your site may have been changed through parameters, keywords, or user exits. For information on setting up banner pages, refer to [Section Two: Installing and Customizing XPAF](#).

#### Changing the banner page format

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To request a different format for the banner pages for your print jobs, contact your systems programmer.

### Checkpoint restart

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For DJDE, page-formatted, and AFP documents sent to centralized, decentralized, and PCL-capable printers, XPAF supports a checkpoint restart.

#### Initiating a checkpoint restart

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The console operator can initiate a checkpoint restart using standard JES2 or JES3 printer commands for interrupting or halting a printer, or the XPAF-exclusive command TERMINATE TASK. For each type of document, processing resumes from the most recent checkpoint as specified in the CKPTPAGE JES printer parameter.

Refer to [Section Seven: XPAF Operator Guide](#) for more information about using operator commands.

## *Changing the checkpoint interval*

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At the system level, your systems programmer may have set the interval between checkpoints using the CKPTPAGE JES printer parameter in the JES printer definition. Contact your systems programmer if you need the system-level interval changed.

For a particular document, you can set the interval between checkpoints by including the CKPTPAGE IBM JCL keyword in the JCL used to submit the job. Refer to [Section Five: XPAF Parameter and Keyword Reference](#) for information about the CKPTPAGE IBM JCL keyword.

## *Forward spacing and backspacing a document*

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For line-mode, DJDE, XES, page-formatted, and AFP documents sent to centralized, decentralized, and PCL-capable printers, XPAF supports forward spacing and backspacing. For each type of document, the printer forward spaces or backspaces to a specified page number from the current page being printed by XOSF (this may not be the actual page that is being printed by the printer).

## *Initiating forward spacing and backspacing*

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The console operator initiates forward spacing and back spacing using standard JES2 or JES3 printer commands for forward spacing or backspacing documents.

## *Limitation*

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When using this feature, forward spacing or backspacing to a specified line number or across dataset boundaries is not supported.

## Printing to tape or disk

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In addition to printing, you can direct any line-mode, DJDE, page-formatted, or AFP document that XPAF has prepared for a centralized printer to disk and/or tape. This allows you to archive printable output for later use. For example, you could use this feature to create a disk backup of an important document, or to store your output to tape and send it to a service bureau for printing.

### Enabling this feature

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This feature must be enabled at installation using a combination of initialization and printer profile parameters:

- You must specify values for the OPDALLOC, OPDUNIT, OPHLQ, OPTEXPDT, OPTUNIT, OPTVOLCT, and OPVOLSER initialization parameters to enable dynamic allocation of tape and/or disk datasets.
- You also must specify the WRITER printer profile parameter to specify the output destination (printer, tape, and/or disk).

For more information about setting up XPAF to print to tape and/or disk, refer to [Section Two: Installing and Customizing XPAF](#). For a complete description of the identified parameters, refer to [Section Five: XPAF Parameter and Keyword Reference](#).

### Selecting the destination for a particular document

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At print time, you can direct a specific document to any supported combination of printer, tape, and/or disk by specifying the OPWRITER extended JCL keyword in the JCL used to submit the job. For more information about this keyword, refer to [Section Five: XPAF Parameter and Keyword Reference](#).

Before you attempt to direct a particular document to tape and/or disk, contact your systems programmer to verify that this feature has been enabled.

### Printing output from tape

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To print a document that was written to tape using the output-to-tape option, the DFAULT PDL distributed in XPFSAMP must have been downloaded to the printer and compiled using the PDL printer command. Mount the tape on the printer's tape drive, then at the printer console, enter this command:

**START TAPE,DEFAULT**

### Limitation — maximum record length

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When using this feature, note that the maximum output record length supported is 256 bytes. If your input record length is greater than 256 bytes, data will be truncated in the output record that is written to tape or disk. However, when the data is printed on a centralized printer, the output is not truncated.

## SMF recording

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XPAF supports IBM's System Management Facility (SMF) recording capability for line-mode, DJDE, XES, page formatted, and AFP document types. SMF recording is not supported for pass-through documents.

XPAF writes an enhanced SMF type 6 PSF record when document processing is complete, and stores it in the system SMF dataset, if recording has been activated.

While XPAF supports SMF recording for printing via TCP or BARR configurations and other intermediate spooling devices, note that for these configurations, your SMF records will reflect job creation information instead of actual printing information. Therefore, you may see differences in your SMF statistics for these types of jobs. For example, the SMF record will be updated even if the job did not print.

XPAF also supports SMF recording when running in either XPSC-compatibility mode or XPAF full-client mode:

- In XPSC-compatibility mode, XPAF writes one SMF record in the XPSM format.
- In XPAF full-client mode, you may choose to have XPSM write either an SMF record for XPAF processing; an SMF record for XPSM processing; or two records, one for each type of processing. The SMF record written by XPSM is not a type 6 record.

For further information on SMF recording for XPSM, refer to the XPSM user documentation.

## Activating

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You can activate SMF recording at installation based on the system for which you wish to receive information:

- For XPAF, specify the SMF initialization parameter.
- For XPSC-compatibility mode or XPAF full-client mode, specify the XPSMBRS and/or XPSMSRS initialization parameters.

For each type of system, SMF recording also can be controlled through the SET SMF RECORDING ON|OFF operator command.

For more information about these initialization parameters, refer to [Section Five: XPAF Parameter and Keyword Reference](#). For more information about the SET SMF RECORDING ON|OFF operator command, refer to [Section Seven: XPAF Operator Guide](#).

## Accessing SMF accounting information

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If you need access to SMF accounting information, contact your systems programmer. For more information about SMF processing, refer to [Section Two: Installing and Customizing XPAF](#).

## *User exits*

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Your site may use user exits to modify XPAF processing (for example, to modify banner page processing).

### *Implementing*

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Typically, user exits are coded and SMP/E-installed during XPAF installation, although user exits also may be added or changed at a later date. For information on coding and installing user exits, refer to [Section Two: Installing and Customizing XPAF](#).

### *Getting information about user exits at your site*

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Contact your systems programmer to determine if any user exits are currently implemented at your site, or to request that a user exit be implemented.

## 31. *Printing line-mode documents*

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This chapter contains the information you need to print line-mode documents through XPAF. It addresses these topics:

- Verifying that your resources have been set up correctly
- Including resources in your documents
- Modifying the processing of your documents
- Using advanced features, such as color
- Processing line-mode documents as DJDE or AFP documents

In addition, it provides troubleshooting tips for resolving some of the common problems you may encounter as you print line-mode documents.

### *Data stream definition*

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Line-mode (or 3211) documents are data streams which consist of carriage control commands and line data.

If you enhance the look of your line-mode data streams by using extended JCL keywords, XPAF no longer considers the data stream a line-mode data stream. XPAF will process it as the relevant data stream type.

### *XPAF support*

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You can print line-mode documents through XPAF to any supported centralized, decentralized, or PCL-capable printer.

### *Preparing resources*

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For many types of documents, there are issues related to resource preparation that you need to address before you submit jobs for printing. However, because line-mode documents contain no printer control commands, they are printed using the fonts, forms, images, logos, colors, and paper trays in effect at the printer at the time the document is printed.

- For centralized printers, these attributes are determined by the started JDE/JDL on the printer or the environment set up by the previous job or job step.
- For decentralized and PCL-capable printers, these attributes are determined by the setup values of the specific printer.

## Using resources

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Just as there are no steps needed to prepare resources for line-mode documents, there are also no procedures for specifying resources.

## Modifying document processing

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For line-mode documents, extended JCL keywords are not used. If you use extended JCL keywords, XPAF no longer considers it a line-mode document. XPAF will process it as the relevant data stream type.

## Using advanced features

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Because line-mode documents contain no printer control commands, advanced features, such as using color or selecting paper trays, are limited to the defaults at the printer as defined by the started JDE/JDL, printer setup, or operator command(s).

For example, you can print line-mode documents in highlight color by issuing a command such as this at the printer console:

```
SUB INK GREEN FOR BLACK
```

The entire line-mode document will then be printed in green.

For more information about highlight color printer commands, refer to the *Xerox 4850/4890 HighLight Color Laser Printing System Command Reference*.

## Printing documents

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Submit your documents for printing using standard JCL. Make sure your output class specifies a supported centralized, decentralized, or PCL-capable printer.

## Processing line-mode documents as DJDE or AFP documents

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You can cause XPAF to process a line-mode document as a DJDE or AFP document by specifying the DEFLINE initialization or printer profile parameter or the PRMODE IBM JCL keyword.

For more information about how XPAF determines the processing mode for a document, refer to chapter 30, "[General information](#)."

### For DJDE processing

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To change the processing mode to DJDE, use one of these options:

- For all documents or documents directed to a particular printer, specify DEFLINE=DJDE in your initialization parameters or printer's profile to force XPAF to process all line-mode documents as DJDE documents using the default JDE/JDL.
- For a particular document, specify PRMODE=DJDE in the JCL to cause the line-mode document to be processed as a DJDE document using the default JDE/JDL.

This processing applies only for decentralized and PCL-capable printers, because centralized printers always print in DJDE mode. If the document is directed to a decentralized or PCL-capable printer, XPAF will process it through the DJDE-to-XES conversion. The font will then be determined by the default JDE/JDL rather than the active font on the decentralized printer, ensuring that you receive consistent line-mode output from both centralized and decentralized printers.

### For AFP processing

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To change the processing mode to AFP, use one of these options:

- For all documents or documents directed to a particular printer, specify DEFLINE=PAGE in your initialization parameters or printer's profile to force XPAF to process all line-mode documents as AFP documents using the default PAGEDEF, FORMDEF, and CHARS values.
- For a particular document, specify PRMODE=PAGE in the JCL to cause the line-mode document to be processed as an AFP document using the default PAGEDEF, FORMDEF, and CHARS values.

## Troubleshooting problems

Occasionally, your output may not print as you expected. If this happens, review the items in table 31-1 for information to help you resolve the problem.

Table 31-1. Common printing errors for line-mode documents

Symptom	Explanation	Steps to take
The document does not fit on the correct number of pages, or lines do not break correctly on a page.	<p>The active font on the printer uses more space than you expected. Typically, a monospaced font uses more space than a proportional font. For example:</p> <p>This is text (arial 10 pt)</p> <p>Thi s i s text (monotype.com 10 pt)</p>	<p>For a centralized printer, review the PDL to determine the font in use. Once you have made any changes needed, recompile the PDL on the printer.</p> <p>For a decentralized printer, check the default font on the printer, and select a new font if necessary.</p> <p>For a PCL-capable printer, check the default font specified in the PORTFONT or LANDFONT printer profile parameter, and specify a new font if necessary.</p>
The document prints in the incorrect orientation.	<p>The print orientation for line-mode documents is determined as follows:</p> <ul style="list-style-type: none"> <li>For centralized printers, orientation is based on the started JDL on the printer.</li> <li>For decentralized printers, orientation is based on the orientation of the active font.</li> <li>For PCL-capable printers, orientation is determined by the last active font on the printer. If you use the XPAF default banner page, this will be a landscape font.</li> </ul>	<p>For a centralized printer, review the PMODE parameter in the active PDE. Once you have made any changes needed, recompile the PDL on the printer.</p> <p>For a decentralized printer, check the orientation of the default font on the printer.</p> <ul style="list-style-type: none"> <li>To print a document in portrait orientation, ensure that a portrait font is selected.</li> <li>To print a document in landscape orientation, ensure that a landscape font is selected.</li> </ul> <p>For a PCL-capable printer, update your banner page if necessary to specify a font in the correct orientation.</p>
When printing to a highlight color printer, the document prints in highlight color instead of black.	Someone has issued the SUBSTITUTE INK command at the highlight color printer's console to select the highlight color.	Issue another SUBSTITUTE INK command to change the color back to black.

Table 31-1. Common printing errors for line-mode documents (Continued)

Symptom	Explanation	Steps to take
When printing to a 4700 printer, data is missing.	The 4700 printer has a non-printable area on the page called a deletion area. If data is positioned in this area, it is not printed. This condition does not produce error messages by XPAF or the printer.	Refer to the printer's manual for the size of the deletion area, then rework the document so that data is not positioned in the 4700 printer's non-printable area.
When printing mixed mode documents (containing both simplex and duplex) to a 4230 or 4220 printer, duplex pages are rotated 180 degrees.	The 4230 and 4220 printers have a printer setup option, Invert Duplex Print Direction, that allows you to change the print orientation for duplex pages. When allowed to default (Disabled), duplex pages are printed in the opposite direction of the simplex pages.	On the printer, change the Invert Duplex Print Direction option to Enabled via the Printer Setup menu, then resubmit the document.



## 32. *Printing DJDE documents*

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This chapter contains the information you need to print DJDE documents through XPAF. It addresses these topics:

- Verifying that your resources have been set up correctly
- Including resources in your documents
- Modifying the processing of your documents
- Using advanced features, such as color
- Converting DJDE documents to XES documents

In addition, it provides troubleshooting tips for resolving some of the common problems you may encounter as you print DJDE documents.

### *Data stream definition*

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DJDE documents contain embedded Xerox printing commands called Dynamic Job Descriptor Entries (DJDEs). DJDEs are control statements that specify how a document should be printed on a centralized printer. They allow you to dynamically modify the centralized printing environment established by the PDL on the printer.

DJDE processing enables certain printer parameters to be changed from one job, page, or record boundary to the next. For example, if the PDL on your printer specified COPIES=2, but you needed five copies of a report, you could override the PDL setting for that one report by coding a DJDE in the input data stream to specify COPIES=5.

You can generate DJDE data streams in one of three ways:

- Format a line-mode data stream using standard IBM and XPAF extended JCL.
- Code DJDEs directly in a data stream or use an application to produce a data stream containing DJDEs. In addition, you can modify the initial DJDE packet using standard IBM and XPAF extended JCL.
- Build an XJCFSIM table to generate the DJDEs. Refer to chapter 37, [“Using XPAF extended features,”](#) for information on XJCF processing.

For detailed information about using PDL and DJDEs, refer to your centralized printer’s reference manual.

## *XPAF support*

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You can print DJDE documents on supported centralized, decentralized, and PCL-capable printers. During document processing, XPAF converts any JCL keywords to DJDEs.

- For documents sent to a centralized printer, no further processing is required.
- For documents sent to a decentralized printer, the DJDEs are converted to XES commands.
- For documents sent to a PCL-capable printer, the DJDEs are converted to XES commands, then the XES commands are converted to PCL commands.

## *DJDE/Extended JCL keyword processing*

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Extended JCL keywords override DJDE parameters in the initial packet of the data stream, which in turn override the PDL printer commands. However, the extended JCL keywords do not override any subsequent DJDE parameters in the data stream (that is, those not in the initial packet).

## Preparing resources

For DJDE documents, there are tasks related to resource preparation that you need to complete before you submit jobs for printing. Before you begin printing documents, contact the system administrator responsible for maintaining your print resources to ensure that the applicable tasks have been completed.



**NOTE:** These tasks are summarized in table 32-1 and described in detail in [Section Three: Managing Resources with XPAF](#).

Table 32-1. Resource preparation for DJDE documents


Resource type	User actions needed	Print time processing
Fonts	For any document using licensed fonts that you want to print to a decentralized printer, obtain a decentralized version of the licensed fonts from either Xerox Font Services or a third-party vendor.	XPAF cannot convert licensed centralized fonts to decentralized format. If XPAF cannot locate a licensed decentralized version of the font in the native font library, document processing will be terminated.
	Load any centralized or decentralized fonts you have purchased from Xerox Font Services or a third-party vendor to the appropriate native font libraries.	XPAF will download fonts from the native font library if they have not been included inline or if they are not resident on the printer.
	Convert a centralized font to decentralized format if you do not have a decentralized version of the font, but want to use the same font in documents printed to both centralized and decentralized printers.   <b>NOTE:</b> All fonts included with XPAF, except language-specific R03 fonts, are provided in both centralized and decentralized format, so preconversion is not necessary for these fonts. However, you must preconvert language-specific R03 centralized fonts to decentralized format.	XPAF does not dynamically convert centralized fonts to decentralized format. If you do not preconvert the font, document processing will be terminated.

Table 32-1. Resource preparation for DJDE documents (Continued)

Resource type	User actions needed	Print time processing
Fonts (continued)	<p>Before you convert a centralized font that you have purchased from either Xerox Font Services or a third-party vendor to decentralized format, update the applicable font tables as needed:</p> <ul style="list-style-type: none"> <li>• Ensure that the Xerox Font Information (XPAFXFI) entry for the centralized font contains valid centralized and decentralized character mapping table names.</li> <li>• Verify that all expected character IDs exist in the centralized character mapping table, and that the character IDs in the decentralized character mapping table are mapped to the desired code point and plane number combination.</li> </ul>	During centralized-to-decentralized font conversion, XOAF uses the centralized and decentralized character mapping tables to determine where to place the centralized characters in the decentralized font.
	Create a resident font list for each channel-attached non-XNS centralized printer, remotely-attached centralized printer, and decentralized printer.	<p>XPAF will check the printer's font list to determine whether a requested font is resident on the printer. If the font is not resident, XPAF will download it.</p> <p>If the printer can store downloaded resources permanently, XPAF will update the printer's font list when it downloads a font.</p>
Forms	Load your centralized and decentralized forms to the appropriate native form libraries.	<p>XPAF will download forms from the native form library if they have not been included inline or if they are not resident on the printer.</p> <p>For documents sent to decentralized printers, XPAF converts any centralized forms referenced in the document to decentralized format.</p> <p>For documents sent to PCL-capable printers, the decentralized (XES) form is then converted to PCL format.</p>
	Create a resident form list for each channel-attached non-XNS centralized printer, remotely-attached centralized printer, and decentralized printer.	<p>XPAF will check the printer's form list to determine whether a requested form is resident on the printer. If the form is not resident, XPAF will download it.</p> <p>If the printer can store downloaded resources permanently, XPAF will update the printer's form list when it downloads a form.</p>

Table 32-1. Resource preparation for DJDE documents (Continued)

Resource type	User actions needed	Print time processing
Images	Load your centralized and decentralized images to the appropriate native image libraries.	<p>XPAF will download images from the native image library if they have not been included inline or if they are not resident on the printer.</p> <p>For documents sent to decentralized printers, XPAF converts any centralized images referenced in the document to decentralized format.</p> <p>For documents sent to PCL-capable printers, the decentralized images are then converted to PCL format.</p>
	Create a resident image list for each channel-attached non-XNS centralized printer, remotely-attached centralized printer, and decentralized printer.	<p>XPAF will check the printer's image list to determine whether a requested image is resident on the printer. If the image is not resident, XPAF will download it.</p> <p>If the printer can store downloaded resources permanently, XPAF will update the printer's image list when it downloads an image.</p>
Logos	Load centralized logos to the native logo library.	XPAF will download logos from the native logo library if they have not been included inline or if they are not resident on the printer.
	Convert centralized logos to decentralized fonts for printing on decentralized printers.	XPAF does not dynamically convert centralized logos to decentralized fonts. If you do not preconvert the logo, document processing will be terminated.
	Create a resident logo list for each channel-attached non-XNS centralized printer and remotely-attached centralized printer.	<p>XPAF will check the printer's logo list to determine whether a requested logo is resident on the printer. If the logo is not resident, XPAF will download it.</p> <p>If the printer can store downloaded resources permanently, XPAF will update the printer's logo list when it downloads a logo.</p>

Table 32-1. Resource preparation for DJDE documents (Continued)

Resource type	User actions needed	Print time processing
Color	(Optional) For highlight color processing, create a color cross-reference table to map the ink color specified in a DJDE document to the ink color loaded on the highlight color printer.	<p>XPAF will look in the specified color cross-reference table to determine the color to use; however, XPAF cannot verify that the color specified in the table matches the ink loaded on the printer.</p> <p>Operator intervention will be required at the printer under these circumstances:</p> <ul style="list-style-type: none"> <li>• If the color you specify in the color cross-reference table is not loaded on the printer.</li> <li>• If you have not created a color cross-reference table, and the color specified in the document does not match the ink loaded on the printer.</li> </ul>
	(Optional) For full color processing using custom colors not defined in the color conversion table, update the color conversion table to map centralized highlight color to decentralized full color, then load it in the appropriate native library.	XPAF will use the color conversion table to determine the RGB color values to be used on the decentralized printer. If your document uses a color not defined in this table, XPAF will substitute black for the undefined color.
Paper trays	Update any cluster mapping tables that differ from your site's setup to map centralized paper tray cluster names to paper trays on decentralized and PCL-capable printers.	When printing to a decentralized or PCL-capable printer, XPAF will attempt to match the cluster name specified in the document to an entry in the cluster mapping table. If there is a match, XPAF will format and print the document using the specified paper size and decentralized paper tray; otherwise, XPAF will use the default entry in the cluster mapping table.
PDL	Load your PDL files to the native PDL libraries. You must ensure that the PDL members compiled on the printer are identical to those loaded to the native PDL libraries, or your results will be unpredictable.	XPAF will use the values in the specified PDL files to help determine the format and processing requirements for the document.

## Using resources

---

For DJDE documents, the fonts, forms, images, and logos you specify in your document can be:

- Included inline as part of the document (only when printing to centralized printers using OSS V2 or higher). Inline resources are specified using the FILE DJDE command in the data stream.
- Resident on the printer. Printer-resident resources can be specified using PDL, DJDEs, or extended JCL keywords.
- Downloaded from an XPAF resource library at print time.

The following sections contain information about extended JCL keywords you can use to specify and update resources at print time. For detailed information about a particular keyword, refer to [Section Five: XPAF Parameter and Keyword Reference](#). For information about using PDL and DJDEs to include resources in a document, refer to your centralized printer's reference manual.

## Specifying

---

XPAF provides a number of extended JCL keywords which you can use to specify fonts, forms, and images in your DJDE documents.

### Fonts

---

You can specify up to 16 fonts to be used within a document using the FONT $nn$  extended JCL keyword. In conjunction with this keyword, you can use the FINDEX extended JCL keyword to establish font indexing. FINDEX enables you to specify the byte position, initial value, and number of low order bits to use in the index.

If you do not specify a font using DJDEs or JCL keywords, the printer will print the document using the font specified or defaulted to in the started JDL on the printer.

### Forms

---

You can specify forms using several extended JCL keywords:

- Use the XFORM $n$  extended JCL keyword to specify the names of up to three forms to be printed in a document. If the document is duplexed, the form(s) will be printed on both sides of the page.
- Use the BFORM $n$  extended JCL keyword to specify the names of up to three forms to be printed on the back of a duplex page.
- Use the RFORM extended JCL keyword to specify the form to be included on all RTEXT pages.

## Images

---

You can specify an image to be included in your DJDE document using the IMAGE extended JCL keyword. This keyword enables you to specify the name, position, and color attributes of an image.

## Logos

---

There are no extended JCL keywords available for specifying logos. Logos can only be referenced through a form created using Host Forms Description Language (HFDL) on the host or forms descriptor language (FDL) on the printer.

For information about FDL commands, refer to the *Xerox 4850/4890 HighLight Color Laser Printing Systems Forms Creation Reference*.

## Revising

---

If your site has created or received a new version of a resource and loaded it to the appropriate XPAF native resource library, the version in the library may no longer match the version on the printer.

For data streams that reference Xerox native resources, you can specify AUTOREV=XEROX in your initialization parameters or the printer's profile to ensure that your document is printed using the most current version of the resource.

To ensure that your document is printed using the most current version of the resource, include the appropriate REVxxxxx extended JCL keyword(s) in the JCL used to submit the job:

- REVFONT
- REVFORM
- REVIMAGE
- REVLOGO

REVxxxxx downloads the specified resource to the printer. Then, for centralized and decentralized printers that are capable of permanently storing resources, the resource is stored on the printer so it will be available for subsequent jobs. For centralized printers only, if you also have specified the equivalent DELxxxxx printer profile parameter or extended JCL keyword (DELFONT, DELFORM, DELIMAGE, or DELLOGO), the resource will not be stored on the printer.

## Deleting

---

You may not want to keep all your resources resident on a printer. Some reasons why you might want to delete them from the printer include:

- **Testing.** If you are testing a new version of a font, form, image, or logo, you may not want to store it until you are certain it is the version you plan to use.
- **Security.** If you want to ensure that a particular resource (such as a licensed font or signature logo) cannot be copied from the printer, you should not store it on the printer.
- **Limited printer disk space.** If you have limited storage on your printer, you can delete resources to increase the amount of space available.

For centralized printers only, you can print a specific document without storing one or more of its resources on the printer. To do this, use the appropriate DELxxxxx extended JCL keyword(s):

- DELFONT
- DELFORM
- DELIMAGE
- DELLOGO

Each of these keywords downloads the specified resource(s) to the centralized printer. Then after the document is printed, it deletes them from the printer so that they will no longer be available.



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**NOTE:** You can include the DELxxxxx parameter(s) in the centralized printer's profile to specify that for all documents, the resources that are downloaded will be deleted from the printer after use.

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## Modifying document processing

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There are many document features you can change at print time using XPAF-supplied parameters and keywords. This section summarizes the extended JCL keywords available in XPAF to change DJDE document processing. Refer to [Section Five: XPAF Parameter and Keyword Reference](#) for information about the keywords identified in this section and for IBM JCL keywords available for DJDE processing.

Table 32-2. Extended JCL keywords for DJDE processing

Extended JCL keyword	Function
BEGIN1– BEGIN4	Defines the origins for up to four logical pages per physical page.
BOF	Specifies the bottom-of-form line number.
CHAN01– CHAN12	Assigns a line number to a channel assignment.
CME	Identifies the copy modification entry to be used for printing the document.
FORMAT	Specifies the PDE to be used to format a document.
JDE	Identifies the JDE to be used for the document.
JDL	Identifies the JDL to be used for the document.
MARGIN	Specifies the left page margin for the document to be printed.
PMODE	Specifies the print orientation for the document.
SIDE	Species the positioning of the first logical page of the document to the first logical page of a physical sheet.
TOF	Specifies the top-of-form line number. This is the line with reference to the top of page on which the first line of text will print in an overflow condition.

## Using advanced features

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Through XPAF, you can print DJDE highlight color documents to both highlight and full color printers. If your printer is equipped with finishing equipment, you can use Document Finishing Architecture (DFA) interface support.

### Highlight color

---

Highlight color DJDE documents can be printed on any centralized printer, 4700 decentralized printer, or PCL-capable printer that supports PCL5C color printing. By using extended JCL keywords, you can override the colors selected by DJDEs (for example, INKXREF) or add color not included in the original DJDEs (for example, COLORIMG).

If you use extended JCL keywords to add highlight color to a DJDE document, you also can print that document on a printer that does not support color. XPAF will ignore the color-related extended JCL keywords and the document will be printed in black.



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**NOTE:** Highlight color DJDE documents cannot be printed in color on the 4900 printer because the 4900 printer's operating system software (OSS) does not support PCL color commands.

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### Mapping color requests

---

If the text colors in your document do not match the colors on the highlight color printer, you can map the color requests to the colors on your printer through color cross-reference tables. When you print a document, XPAF changes the color request from the color coded in the data stream to the color specified in the color cross-reference table.

You can print a highlight color document to a 4700 printer or PCL-capable printer that supports PCL5C color printing without modifying the document. XPAF uses the color conversion table to convert highlight color requests to RGB format for the text only. You can update the color conversion table if you want to change its default color assignments or add custom colors. If you modify the color conversion table, you must reload it using either the XOAF Maintain the Color Conversion Table option on the Manage Tables menu or the LOAD INKS TSO/batch command.

Refer to [Section Three: Managing Resources with XPAF](#) for more information about creating, maintaining, and loading these tables.

## Using color resources

---

You can include color forms, images, and logos in your DJDE documents.

### Forms

---

The color forms you create using HFDL on the host or FDL on the printer can be printed through XPAF without modification. For information about FDL commands, refer to the *Xerox 4850/4890 HighLight Color Laser Printing Systems Forms Creation Reference*.

### Images and logos

---

Using utilities that are resident on the centralized highlight color printer, you can convert existing images and logos to color format. For example, you can convert logos to color format using the File Conversion Utility (FCU). For more information, refer to the *Xerox 4850/4890 HighLight Color Laser Printing Systems Programming and Administration Guide*.

Images that have not been converted to color format also can be printed in color using the COLORIMG extended JCL keyword.

## Using extended JCL keywords

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Using extended JCL keywords, you can specify highlight color features for a document. Extended JCL keywords override any corresponding DJDE keywords included in the initial packet of a document.

Table 32-3. Highlight color-related extended JCL keywords for DJDE documents

Extended JCL keyword	Function
COLORIMG	Identifies colors to be applied to up to eight IMAGE DJDE records that are not already coded with an INKREF name.
ICATALOG	Identifies the ink catalog to use when ink references do not specify an ink catalog.
IDFAULT	Identifies the ink to be used when an ink is not specified in a resource.
IDR	Specifies the ink descriptor name.
ILIST	Specifies up to eight ink reference names to be used in an ink list and referenced by the ink index.
IMAGE	Defines image positioning and color parameters for the named image.
INKINDEX	Specifies the position within a user data record that contains the index to a specific ink reference name.
INKXLIB	Identifies the DD name of the library where the color cross-reference tables are stored.
INKXREF	Identifies the name of the color cross-reference table.
IRESULT	Identifies the ink to be used when different inks overlay on a pixel.

Table 32-3. Highlight color-related extended JCL keywords for DJDE documents (Continued)

Extended JCL keyword	Function
NUMBER	Specifies that page numbers will be printed for a document, and in which color they will be printed
PALETTE	Identifies the color palette to be used on the page.
XMP	Specifies whether to use Xerographic mode switching (XMS) to print the entire document using highlight color print mode.

### *Color-related keyword overrides*

This table shows the overrides for printer commands, initial packet DJDEs, and extended JCL keywords.

Table 32-4. Color-related keyword overrides for DJDE documents

PDL command/parameter	Overridden by DJDE keyword in the initial packet	Overridden by extended JCL keyword
ABNORMAL/IMISMATCH		
ABNORMAL/ISUBSTITUTE		
CME/INK		
IDR/ICATALOG	ICATALOG	ICATALOG
IDR/ILIST	ILIST	ILIST
IDR/PALETTE	PALETTE	PALETTE
LINE/INKINDEX	INKINDEX	INKINDEX
OUTPUT/BFORM	BFORM	BFORM1– BFORM3
OUTPUT/CYCLEFORMS		
OUTPUT/FORMS	FORMS	XFORM1– XFORM3
OUTPUT/IDFAULT	IDFAULT	IDFAULT
OUTPUT/IDR	IDR	IDR
OUTPUT/IMAGE	IMAGE	IMAGE
OUTPUT/IRESULT	IRESULT	IRESULT
OUTPUT/NUMBER	NUMBER	NUMBER
OUTPUT/XMP	XMP	XMP

## Document finishing

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You can use XPAF features to control some aspects of document finishing, including:

- Collating
- Shifting data for binding purposes
- Stapling
- Setting the finishing boundary
- Paper tray selection

### Collating

---

For centralized printers only, when you are printing multiple copies of a document, you can use the COLLATE extended JCL keyword to ensure that XPAF prints one complete copy of the document before starting the next copy.

### Shifting output for binding

---

You can use the SHIFT extended JCL keyword to specify a shift of the page data for binding purposes. Shifting data toward the outer edge of the page helps prevent text from being obscured when pages are bound together or hole-punched.

### Stapling

---

For centralized printers that support stapling, you can staple documents by specifying the JDE extended JCL. This keyword must name a JDE that is coded for stapling.

XPAF provides a sample JDE called STAPLE in the XPFSAMP member DFAULT. STAPLE has been commented out. To use it, you must uncomment it, then load it into your PDL library on the host, and compile it on the printer.

You can use your own JDE if you wish. The JDE must contain a statement similar to this:

```
OUTPUT STAPLE=YES,NT01=YES,FACEUP=YES;
```

The JDE must be loaded into your PDL library on the host, downloaded to the printer, and compiled.

## Setting the finishing boundary

---

For centralized printers only, you can specify a finishing boundary for a document if your printer supports the Document Finishing Architecture (DFA) interface (version 4.1 or higher). The output is finished at the end of the document.

To specify a finishing boundary, perform these steps:

- Step 1.** Ensure that the printer's profile specifies FEATURE=DFA.
- Step 2.** Use the SF1 and/or SF2 extended JCL keywords in your JCL to instruct XPAF to send DJDEs to the printer to raise (that is, turn on) or lower (that is, turn off) signal function 1 and/or signal function 2 for document finishing purposes.

Refer to [Section Five: XPAF Parameter and Keyword Reference](#) for more information about the SF1 and SF2 extended JCL keywords. For more information about DJDEs, refer to the PDL/DJDE reference manual for your printer.



**NOTE:** XPAF does not determine the function of signal function 1 and signal function 2; the signal's function is defined by the third-party finishing equipment. Refer to the finishing equipment documentation supplied by your third-party vendor for more information about the equipment's use of signal functions.

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## Using extended JCL keywords

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Using extended JCL keywords, you can specify several finishing features for a document

Table 32-5. Finishing-related extended JCL keywords for DJDE documents

Extended JCL keyword	Function
COLLATE	Specifies whether the output will be collated.
SF1	Specifies that XPAF will send a DJDE to the centralized printer to control signal function 1 at the start of a page.
SF2	Specifies that XPAF will send a DJDE to the centralized printer to control signal function 2 at the start of a page.
SHIFT	Specifies a shift of the page data for binding purposes.

## Paper tray selection

XPAF uses cluster mapping tables to map a centralized paper tray cluster name to a paper tray on a decentralized or PCL-capable printer. Each paper tray is mapped to a paper name which is then matched to a paper size in the currently active paper name table.

XPAF provides a default cluster mapping table for each printer model. You can also specify your own cluster mapping tables using the CLUSTRTB printer profile parameter or extended JCL keyword. Refer to [Section Three: Managing Resources with XPAF](#) for a discussion on how cluster mapping tables are used and for instructions on creating and updating the cluster mapping tables.





**CAUTION:** If you specify a value for PAPERSIZ in your extended JCL, that value overrides all paper name values in your currently active cluster mapping table. All other cluster mapping table processing occurs normally.

## Using extended JCL keywords

Using extended JCL keywords, you can specify several paper-related table features for a document.

Table 32-6. Paper table-related extended JCL keywords for DJDE documents

Extended JCL keyword	Function
CLUSTRTB	Identifies the cluster mapping table used by XPAF to map a centralized paper tray cluster name to a paper tray on a decentralized or PCL-capable printer.
FEED	<p>Specifies the printer cluster (paper tray group) from which paper will be selected.</p>  <p><b>NOTE:</b> When printing to a decentralized or PCL-capable printer, XPAF matches the value for this keyword to an entry in the cluster mapping table to determine the paper size and decentralized paper tray.</p>
PAPERSIZ	<p>Specifies the paper size to be used for the document. The paper loaded in the tray from which the job feeds must be the same size as you specify using this keyword.</p>  <p><b>CAUTION:</b> The value for this keyword overrides any paper name entries in the currently active cluster mapping table.</p>
PAPNAMTB	Identifies the paper name table used by XPAF to determine the physical paper size dimensions that correlate to a specified paper name.

## Printing documents

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Submit your documents for printing using standard JCL. Make sure your job class references a supported centralized, decentralized, or PCL-capable printer.



---

**NOTE:** The next section contains information about converting DJDE documents to XES documents for printing on decentralized printers. If you direct your document to a PCL-capable printer, the DJDE commands will be converted to XES commands, then the XES commands are converted to PCL commands. Refer to chapter 33, [“Printing XES documents”](#) for information about the XES-to-PCL conversion.

---

## Converting DJDE documents to XES documents

---

If you direct a DJDE document to a decentralized printer, XPAF will convert the DJDE commands into XES commands. Print lines are then formatted with XES commands so that the printed results will match the results from a centralized printer.

### Processing overview

---

When printing documents to a decentralized printer, the DJDE-to-XES conversion is invoked whenever:

- A DJDE command is found in the first record of the data stream
- PRMODE=DJDE is specified in the JCL used to submit the job

This includes jobs conditioned by extended JCL that reference features that are invoked by DJDEs. The DJDE environment is maintained between datasets and is reset only when a banner page/RSTACK condition is detected.

### Default values

---

The PDL stored in your native PDL library is used to apply default JSL values and cataloged member values. A native PDL library is specified in the XOSF start-up proc DD statement named by the PDLLIB initialization or printer profile parameter. If this library does not exist or is not loaded with current information, the job formatting will be limited to values found in the DJDEs.

### Multiple-step jobs

---

For multiple-step jobs sent to decentralized or PCL-capable printers, if line-mode data is in a separate step from the DJDEs that format the data, XPAF may print the data as a line-mode document using the decentralized or PCL-capable printer's default font, respectively. If this happens, you must force the line-mode data to go through the DJDE-to-XES conversion and use the formatting parameters from the previous DJDE step. You can do this in one of several ways:

- Include a DJDE command in the first record of the line-mode data stream.
- Specify PRMODE=DJDE in your JCL to identify the line-mode data stream as DJDE data stream.
- Specify DEFLINE=DJDE in your initialization parameters or printer's profile to force all line-mode data to be treated as DJDE data.

## Supported DJDE/PDL statements

Table 32-7 lists the DJDE and PDL statements supported for DJDE-to-XES conversion. This table does not list any DJDE and PDL statements that are either not applicable or not supported.

Table 32-7. DJDE/PDL statements supported for DJDE-to-XES conversion

DJDE/PDL statement	Command	Limitations
BANNER	HCOUNT	
BANNER	TCOUNT	
BANNER	TEST	
CME	CONSTANT	
CME	FONT	
CME	INK	
CME	LINE	
CME	POSITION	
CODE	ASSIGN	
CODE	DEFAULT	
CRITERIA	CHANGE	
CRITERIA	CONSTANT	
CRITERIA	LINENUM	
DJDE	ALTER	
DJDE	ASSIGN	
DJDE	BATCH	
DJDE	BEGIN	
DJDE	BFORM	
DJDE	BOF	
DJDE	C (comment)	
DJDE	CANCEL	
DJDE	COLLATE	
DJDE	COPIES	
DJDE	DATA	

Table 32-7. DJDE/PDL statements supported for DJDE-to-XES conversion (Continued)

DJDE/PDL statement	Command	Limitations
DJDE	DUPLEX	
DJDE	END	
DJDE	FEED	
DJDE	FILE	Only .FRM and .IMG files are recognized and are treated as temporary resources
DJDE	FONTINDEX	
DJDE	FONTS	
DJDE	FORMAT	
DJDE	FORMS	
DJDE	GRAPHIC	
DJDE	IDFAULT	
DJDE	ILIST	
DJDE	IMAGE	
DJDE	INKINDEX	
DJDE	ITEXT	
DJDE	JDE	
DJDE	JDL	
DJDE	MARGIN	
DJDE	MODIFY	
DJDE	NUMBER	
DJDE	OTEXT	
DJDE	OVERPRINT	
DJDE	PMODE	
DJDE	RFORM	
DJDE	RTEXT	
DJDE	SHIFT	
DJDE	SIDE	
DJDE	STOCKS	

Table 32-7. DJDE/PDL statements supported for DJDE-to-XES conversion (Continued)

DJDE/PDL statement	Command	Limitations
DJDE	TOF	
IDEN	OFFSET	
IDEN	PREFIX	
IDEN	SKIP	
IDR	ILIST	
LINE	DATA	
LINE	FONTINDEX	
LINE	INKINDEX	
LINE	MARGIN	
LINE	OVERPRINT	
LINE	VFU	
MESSAGE	ITEXT	Supported only on 4700, 4235, and 3700 printers.
MESSAGE	OTEXT	Supported only on 4700, 4235, and 3700 printers.
OUTPUT	BFORM	Supported only on duplex printers.
OUTPUT	COLLATE	
OUTPUT	COPIES	
OUTPUT	COVER	
OUTPUT	CYCLEFORMS	
OUTPUT	DUPLEX	
OUTPUT	FEED	
OUTPUT	FORMAT	
OUTPUT	FORMS	
OUTPUT	GRAPHIC	
OUTPUT	IDFAULT	
OUTPUT	IMAGE	
OUTPUT	MODIFY	
OUTPUT	NUMBER	

Table 32-7. DJDE/PDL statements supported for DJDE-to-XES conversion (Continued)

DJDE/PDL statement	Command	Limitations
OUTPUT	OFFSET	
OUTPUT	SHIFT	
PDE	BEGIN	
PDE	FONTS	
PDE	PMODE	
RAUX	TEST	
RFEED	TEST	
ROFFSET	TEST	
ROUTE	RFORM	
ROUTE	RTEXT	
RPAGE	SIDE	
RPAGE	TEST	
RPAGE	WHEN	
RSTACK	DELIMITER	
RSTACK	TEST	
TABLE	CONSTANT	
TABLE	MASK	Only these options are supported: IGNORE-CHAR, CHARSPEC1, and CHARSPEC2.
VFU	ASSIGN	
VFU	BOF	
VFU	TOF	
VOLUME	CODE	

## *Processing limitations*

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When directing a DJDE document to a decentralized or PCL-capable printer, restrictions apply to certain elements, including:

- Decentralized printer functionality
- Highlight color support for the 4900 printer
- Image magnification
- Operator messages
- Paper trays
- Color start Metacodes

### *Color start Metacodes*

---

When using the Fill color start (X'0A') and Highlight color start (X'0C') metacodes, an INKLIST must be used to determine the color to use.

### *Decentralized printer functionality*

---

These limitations apply for decentralized printers:

- Output from a DJDE-to-XES conversion is limited to the functionality of the destination decentralized printer. XPAF ignores DJDE and PDL commands that do not apply to the destination decentralized printer.
- Because of differences in the printers' hardware and software, XPAF handles invalid DJDE packets differently for centralized and decentralized printers. Results vary depending on the invalid command and cannot be predicted.

### *Highlight color support for the 4900 printer*

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XPAF cannot print highlight color documents on the 4900 printer because the 4900 printer's OSS does not support PCL color commands.

## Image magnification

---

Output from a DJDE-to-XES conversion limits centralized image magnification to two or four times the actual size. This is a limitation of decentralized image processing.

Table 32-8 shows the differences between centralized and decentralized image magnification (assuming that  $x$  is your centralized image magnification factor).

Table 32-8. Image magnification factors

Centralized	Decentralized
$0.125 \leq x < 2$	1
$2 \leq x < 4$	2
$4 \leq x \leq 8$	4

## Operator messages

---

These limitations apply to the ITEXT and OTEXT extended JCL keywords:

- ITEXT or OTEXT messages cannot be specified for a particular copy of a job.
- OTEXT messages that specify the END parameter appear at the start of the output print job rather than at the end.
- The WAIT parameter is ignored, and operator intervention is required to continue printing the job.

## Paper trays

---

These limitations apply to paper tray processing:

- Paper tray remapping on the printer is not supported. You should use a cluster mapping table instead to define paper tray mapping for decentralized and PCL-capable printers.
- Because it is a centralized printer operator command, XPAF cannot support the CLUSTER printer command during DJDE-to-XES conversion. Use a cluster mapping table instead to define paper tray mapping for decentralized and PCL-capable printers.
- XPAF will terminate processing of any document with a PDL-defined paper size that is not supported by the destination decentralized or PCL-capable printer.

## Troubleshooting problems

Occasionally, your output may not print as you expected. If this happens, review the items in table 32-9 for information to help you resolve the problem.

Table 32-9. Common printing errors for DJDE documents

Symptom	Explanation	Steps to take
A job containing multiple images fails at the printer.	The printer may not support the number of images contained on the page or may not have enough memory to process the images in your data stream. The number of images per page that can be printed by a printer varies from printer to printer, depending on image complexity and available printer memory.	For specific image limitations, refer to your printer reference manual. Update your document to use images in a manner that your printer can support, or use a different printer to print the document.
The printed output contains a blank page prior to the first page of data.	A blank page is printed prior to the first page of data for DJDE jobs whose first record contains a space 1 line and print ANSI carriage control (space character) and a DJDE.	To prevent a blank page from printing, replace the space 1 line and print carriage control character on the first DJDE record with a write without spacing carriage control character (+).
The printed output contains form positioning errors.	If no paper size is specified in the source version of a form, XPAF uses a default value of LETTER (8 1/2 inches by 11 inches).  If the form you want to print was designed for a paper size other than LETTER, but no paper size was specified in the form, then the form will be mispositioned when printed through XPAF.	Ensure that the appropriate paper size value is specified in the source version of the form, then recompile it.
After you start the printer and submit a job, XPAF fails with an 0C1 abend.	If you recently applied MVS/JES maintenance but did not rerun the XPAF usermod installation job, then XPAF no longer has access to the correct JES control block offsets for processing at your site.	Resubmit UMJOB101 to APPLY the JES offset table.

Table 32-9. Common printing errors for DJDE documents (Continued)

Symptom	Explanation	Steps to take
DJDEs are printed as data.	<p>You have mismatched values in your initialization parameters, extended JCL keywords, and/or PDL. These mismatched values can cause two types of errors:</p> <ul style="list-style-type: none"> <li>• XPAF may process the DJDE document in another mode (such as AFP).</li> <li>• XPAF may be unable to recognize the DJDEs in the document.</li> </ul>	<p>Issue the SET INTENSIVE LOGGING ON operator command to enable intensive logging to the XPAF log dataset. Review the log for messages identifying the processing mode in effect.</p> <ul style="list-style-type: none"> <li>• If AFP processing is active, ensure that the SYSFCB initialization parameter value matches the JES default FCB value, and that the SYSFONT initialization parameter value matches the JES default UCS value.</li> <li>• If DJDE processing is active, ensure that your IDENnn, DJDEOFnn, and DJDESKnn initialization parameter values match the corresponding values in the PDL.</li> </ul>
When printing a multiple-step job to a decentralized or PCL-capable printer, data is not formatted correctly.	<p>If the line-mode data is in a separate step from the DJDE packets that format the data, XPAF may print the data as a line-mode document using the decentralized or PCL-capable printer's default font.</p>	<p>You must force the line-mode data to go through the DJDE-to-XES conversion and use the formatting parameters from the previous DJDE step. Perform one of these actions:</p> <ul style="list-style-type: none"> <li>• Include a DJDE command in the first record of the line-mode data stream.</li> <li>• Specify PRMODE=DJDE in your JCL to identify the line-mode data stream as a DJDE data stream.</li> <li>• Specify DEFLINE=DJDE in your initialization parameters or printer's profile to force all line-mode data to be treated as DJDE data.</li> </ul>
When printing to a 4700 printer, data is missing.	<p>The 4700 printer has a non-printable area on the page called a deletion area. If data is positioned in this area, it is not printed. This condition does not produce error messages by XPAF or the printer.</p>	<p>Refer to the printer's manual for the size of the deletion area, then rework the document so that data is not positioned in the 4700 printer's non-printable area.</p>

Table 32-9. Common printing errors for DJDE documents (Continued)

Symptom	Explanation	Steps to take
When printing to a 4700 or 4235 printer, the ITEXT and OTEXT messages do not appear on the printer console.	The data stream has messages coded via the ITEXT and/or OTEXT extended JCL keywords after the initial DJDE packet.	XPAF only recognizes ITEXT and OTEXT messages that are coded in the initial DJDE packet. These messages are displayed on the console at the beginning of the document. XPAF ignores any ITEXT and OTEXT messages coded after the initial DJDE packet.
When printing to a 4235 printer running in XPPM mode, PDEs are printed as data.	The 4235 printer in XPPM mode requires that the PDL source be compiled on the host before it is downloaded to the printer.	Compile your PDL on the host using a host resident PDL compiler such as XJDC. Then, download the object to your printer using either \$DJDECPY or \$HOSTCPY in XPFSAMP. Replace 'DFAULT' with the compiled file's name.
When printing mixed mode documents (containing both simplex and duplex) to a 4230 or 4220 printer, duplex pages are rotated 180 degrees.	The 4230 and 4220 printers have a printer setup option, Invert Duplex Print Direction, that allows you to change the print orientation for duplex pages. When allowed to default (Disabled), duplex pages are printed in the opposite direction of the simplex pages.	On the printer, change the Invert Duplex Print Direction option to Enabled via the Printer Setup menu, then resubmit the document.
When printing to a 4045 printer, an unexpected page advance occurs in the middle of the document.	If you change the page orientation mid-document and have not installed an XGRAPH cartridge on your 4045 printer, a page advance occurs with the change of orientation.	Perform one of these actions: <ul style="list-style-type: none"> <li>• Install an XGRAPH cartridge on the printer.</li> <li>• Use a different printer to print the document.</li> <li>• Update the document to remove the change in page orientation.</li> </ul>
When printing to a 3700 printer, forms are not downloaded correctly.	You may be running the wrong level of software on the printer (2.5-11 through 2.5-18).	Upgrade the printer software to release 2.5-21.



## 33. *Printing XES documents*

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This chapter contains the information you need to print XES documents through XPAF. It addresses these topics:

Verifying that your resources have been set up correctly

- Including resources in your documents
- Modifying the processing of your documents
- Using advanced features, such as color
- Converting XES documents to PCL documents

In addition, it provides troubleshooting tips for resolving some of the common problems you may encounter as you print XES documents.

### *Data stream definition*

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In XES data streams, escape sequences dynamically change parameters for decentralized printers. You can define a user-defined key (UDK), which acts as a signal to the printer that an escape sequence follows.

Escape sequences can be used to define the format and processing for a document. For example, you can include escape sequences that position text on a page, draw rules, and change fonts. Refer to your decentralized printer XES reference manual for more information on XES commands.

### *Expected format of XES data stream*

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When printing native mode XES data streams via XPAF, the data stream must meet these criteria:

- Be in EBCDIC encoded format
- The first record must contain =UDK= starting in the first column
- For data streams being sent to PCL-capable printers, include only supported XES commands

For a listing of XES commands supported for PCL-capable printers, refer to "[Supported XES commands](#)" later in this chapter and your printer documentation.

## XPAF support

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You can print XES documents through XPAF to any decentralized or PCL-capable printer.

- When printing to a decentralized printer, XPAF accepts escape sequences and sends them to the printer without conversion.
- When printing to a PCL-capable printer, XPAF converts the escape sequences to PCL commands before sending them to the printer.



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**NOTE:** XES documents cannot be printed on centralized printers.

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## Preparing resources

For XES data streams, there are tasks related to resource preparation that you need to complete before you submit jobs for printing. Before you begin printing documents, contact the system administrator responsible for maintaining your print resources to ensure that the applicable tasks have been completed.



**NOTE:** These tasks are summarized in table 33-1 and described in detail in [Section Three: Managing Resources with XPAF](#).

Table 33-1. Resource preparation for XES documents



Resource type	User actions needed	Print time processing
Fonts	Load any decentralized fonts you have purchased from either Xerox Font Services or a third-party vendor to the native decentralized font library.	<p>XPAF will download decentralized fonts from the native font library if they have not been included inline or if they are not resident on the decentralized printer.</p> <p> <b>NOTE:</b> If you are using PCL-capable printers, you do not need to load fonts to the PCL font library; XPAF converts decentralized fonts to PCL bitmapped format during processing, then stores them in the PCL font library for subsequent use.</p>
	<p>If you have purchased centralized fonts from either Xerox Font Services or a third-party vendor, you can convert those fonts to decentralized format and specify them in XES documents sent to decentralized or PCL-capable printers.</p> <p>Convert a centralized font to decentralized format if you do not have a decentralized version of the font, but want to use it in XES documents.</p> <p> <b>NOTE:</b> All fonts included with XPAF are provided in both centralized and decentralized format, so preconversion is not necessary for these fonts.</p>	<p>When printing an XES document to a decentralized or PCL-capable printer, XPAF does not dynamically convert centralized fonts to decentralized format. If you attempt to specify a centralized font, document processing will be terminated.</p>

Table 33-1. Resource preparation for XES documents (Continued)



Resource type	User actions needed	Print time processing
Fonts (Continued)	Create a resident font list for each decentralized printer.	<p>XPAF will check the decentralized printer's font list to determine whether a requested font is resident on the printer. If the font is not resident, XPAF will download it.</p> <p>If the decentralized printer can store downloaded resources permanently, XPAF will update the printer's font list when it downloads a font.</p>
Forms	Load your decentralized forms to the native decentralized form library.	<p>XPAF will download decentralized forms from the native form library if they have not been included inline or if they are not resident on the decentralized printer.</p> <hr/> <p> <b>NOTE:</b> If you are using PCL-capable printers, you do not need to load forms to the PCL form library; XPAF converts a decentralized form to a PCL macro (which contains a set of PCL commands that define the form) during processing, then stores it in the PCL form library for subsequent use.</p> <hr/>
	Create a resident form list for each decentralized printer.	<p>XPAF will check the decentralized printer's form list to determine whether a requested form is resident on the printer. If the form is not resident, XPAF will download it.</p> <p>If the decentralized printer can store downloaded resources permanently, XPAF will update the printer's form list when it downloads a form.</p>

Table 33-1. Resource preparation for XES documents (Continued)

Resource type	User actions needed	Print time processing
Images	Load your decentralized images to the native decentralized image library.	<p>XPAF will download images from the native image library if they have not been included inline or if they are not resident on the printer.</p> <hr/> <p> <b>NOTE:</b> If you are using PCL-capable printers, you do not need to load images to the PCL image library; XPAF converts images from sixelized format to bitmapped (HP raster graphic) format during processing, then stores them in the PCL image library for subsequent use.</p> <hr/>
	Create a resident image list for each decentralized printer.	<p>XPAF will check the decentralized printer's image list to determine whether a requested image is resident on the printer. If the image is not resident, XPAF will download it.</p> <p>If the decentralized printer can store downloaded resources permanently, XPAF will update the printer's image list when it downloads an image.</p>
Logos	Convert centralized logos to decentralized fonts if you want to use them in XES documents.	XPAF does not dynamically convert centralized logos to decentralized fonts for use in native XES documents. If you attempt to specify a logo, document processing will be terminated.
Color	For highlight color processing: None.	Not applicable. Highlight color cannot be specified in an XES document.
	For full color processing: None.	XPAF passes color-specific XES commands directly to the 4700 printer for processing.
Paper trays	None.	<p>XPAF passes the XES paper tray select command directly to a decentralized printer, and converts it to an equivalent PCL tray select command when printing to a PCL-capable printer.</p> <p>(If the XES document is the result of a DJDE-to-XES conversion, then the paper tray may have been specified originally in the DJDE document using the cluster mapping table.)</p>
PDL	None.	Not applicable. PDL does not affect XPAF processing of XES documents.

## Using resources

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For XES documents, the fonts, forms, and images you specify in your document can be:

- Resident on the printer. Printer-resident resources can be specified using XES commands.
- Downloaded from an XPAF resource library at print time.

The following sections contain information about extended JCL keywords you can use to specify and update resources at print time. For detailed information about a particular keyword, refer to [Section Five: XPAF Parameter and Keyword Reference](#).

## Specifying

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For XES documents, there are no extended JCL keywords which you can use to specify resources at print time.

## Revising

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If your site has created or received a new version of a resource and loaded it to the appropriate XPAF native resource library, the version in the library may no longer match the version on the printer.

For data streams that reference Xerox native resources, you can specify `AUTOREV=XEROX` in your initialization parameters or the printer's profile to ensure that your document is printed using the most current version of the resource.

To ensure that your document is printed using the most current version of the resource, include the appropriate `REVxxxxx` extended JCL keyword(s) in the JCL used to submit the job:

- `REVFONT`
- `REVFORM`
- `REVIMAGE`

`REVxxxxx` downloads the specified resource to the printer. Then, for centralized printers and decentralized printers that are capable of permanently storing resources, the resource is stored on the printer so it will be available for subsequent jobs. For centralized printers only, if you also have specified the equivalent `DELxxxxx` printer profile parameter or extended JCL keyword (`DELFONT`, `DELFORM`, or `DELIMAGE`), the resource will not be stored on the printer.

## Deleting

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For XES documents, there are no extended JCL keywords which you can use to delete resources resident on a printer.

## Modifying document processing

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For XES documents, there are several extended JCL keywords available to modify document processing, as shown in table 33-2. Refer to [Section Five: XPAF Parameter and Keyword Reference](#) for additional information about these keywords.

Table 33-2. Extended JCL keywords for XES processing

Extended JCL keyword	Function
MLANG	Indicates whether the target printer supports mode change key (MCK) document switch processing. If you specify MLANG=Y, you also must specify a value for the PCLDS extended JCL keyword.
PCLDS	Identifies the data stream being printed.
PCLREQ	For printing to a PCL-capable printer, indicates whether the document is converted to PCL5 format, passed through without conversion, or converted as specified by the PCL printer profile parameter.

## Using advanced features

Because XPAF does not enhance the processing of advanced features (such as using color or selecting paper trays), you are limited to the XES commands supported by the destination decentralized or PCL-capable printer.

### Color

Although there are no extended JCL keywords available for specifying color, you can include color in your XES documents by specifying XES color-specific commands. These commands enable you to add color to text, graphic lines, background text highlighting, and graphic window bitmap separations.



**NOTE:** You cannot specify highlight color in an XES document.

When printing to a 4700 printer, XPAF accepts XES printer commands which allow you to implement color, including the commands identified in table 33-3.

Table 33-3. Color commands for XES data streams

Command	Function
Assign Ink Color	Specifies the color or gray-shade parameter values to use as the substitute for a color or gray-shade palette entry.
Text Highlight	Specifies the background text color or gray-shade for characters that appear highlighted. This value may be applied on a text or paragraph basis.
Ink Change	Selects a color or gray-shade entry for the palette. This value can then be used for text, logos, non-graphic lines, and any other data that has been digitized into font characters.
Line Draw X	Draws a non-graphic line of specified length along the X-axis of the page. Use the S variable to select the color or gray-shade palette entry.
Line Draw Y	Draws a non-graphic line of specified length along the Y-axis of the page. Use the S variable to select the color or gray-shade palette entry.
Vector Draw	Draws a non-graphic line of specified length along the X-axis, the Y-axis, or diagonally across the page. Use the S variable to select the color or gray-shade palette entry.
Graphic Window	Defines an area on the page where graphics will be printed. Use the C variable to specify the color of the separation bitmap to use for the graphic window.

For more information on these commands, refer to the *Xerox 4700 II Color Laser Printing System Printer Language Reference*.

## *Paper tray selection*

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For XES documents printed to PCL-capable printers, the XES tray select command is converted to a PCL tray select command. Because XES and PCL use different identifiers to select the manual feed tray, the tray selected may not be equivalent to the original. You may need to change your XES document to specify the PCL manual feed tray correctly.

## Verifying your print environment

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This section identifies any additional steps you should take before you begin submitting jobs.

### Setting the Printer Command Language

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Several Xerox printers accept more than one Printer Command Language when printing documents. Therefore, before you print XES documents to these printers, ensure that the PCL printer profile parameter specifies PCL=XES (default value for decentralized printers):

- 4700 II
- 4235 (in XDPM mode)
- 4213 II

### Printing to a PCL-capable printer

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Before you print XES documents to a PCL-capable printer, check with your systems programmer to ensure that these actions have been completed:

- The PCL font, form, and image resource libraries have been allocated and initialized on the host system.
- The PFONTLIB, PFORMLIB, and PIMAGELIB initialization and/or printer profile parameters have been coded and point to the DD statements that define the PCL resource libraries for the specified printer.
- The PCL printer profile parameter is set to the value used for PCL-capable printers (PCL=PCL5).
- The PCL options have been set on the target printer, or XPAF is set up to dynamically change the print mode on the printer via MCK document switch processing. Either way, you must specify the MLANG printer profile parameter or extended JCL keyword to indicate whether the printer supports automatic document switch processing.

For more information about setting the above options, refer to [Section Two: Installing and Customizing XPAF](#). For more information about these parameters and keywords, refer to [Section Five: XPAF Parameter and Keyword Reference](#).

## Printing documents

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Submit your documents for printing using standard JCL. Make sure your job class references a supported decentralized or PCL-capable printer.

## Converting XES documents to PCL documents

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Using XPAF, you can convert DJDE, XES, page-formatted, and AFP documents to PCL format for printing on PCL-capable printers. DJDE, page-formatted, and AFP documents are first converted to XES documents, which are then converted to PCL format.

### Processing overview

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When printing documents to a PCL-capable printer, XPAF searches the PCL resource libraries to determine if the resources already reside in the libraries. If they do, then XPAF uses the resources stored in the libraries. If they do not, or if you have requested a revision of them, then XPAF dynamically converts the resources.

- XPAF converts each font from Xerox 2700 format to PCL bitmapped format, then stores it in the library specified by the PFONTLIB initialization or printer profile parameter. This conversion ensures that the correct positioning is used when the page output is produced.
- XPAF converts each form from XES format to a PCL macro which contains a set of PCL commands that define the form. The PCL macro is executed at print time to reproduce the form as it appeared in XES format.
- XPAF converts each image from sixelized format to bitmapped (HP raster graphic) format, then stores it in the library specified by the PIMAGELIB initialization or printer profile parameter.

Resources which are included inline in the data stream are converted to PCL format but are not stored in the PCL resource libraries. There are two reasons for handling inline resources this way:

- To ensure that an inline test resource does not overlay a stored production version of the same name.
- For security reasons, so that signature fonts or other confidential resources are not accessible to other jobs.

XPAF downloads the necessary resources every time a PCL job is printed but does not store them on the printer.

### Supported XES commands

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Table 33-4 lists the XES commands that are supported by XPAF for PCL processing.



**NOTE:** If you include an unsupported XES command in a document, XPAF will issue an error message indicating that an unsupported command has been specified. It ignores the command and processing continues, but your output may be unpredictable.

---

Table 33-4. XES commands supported for XES-to-PCL conversion

XES command	Definition
=UDK=	Set a new UDK string
+X	Reset printer OSS
+F	Font load
+A	Font add
+M	Merge page load
a	Absolute text positioning
rd	Relative down text positioning
ru	Relative up text positioning
rl	Relative left text positioning
rr	Relative right text positioning
x	Draw X line
y	Draw Y line
<i>n</i>	Font switching ( <i>n</i> = 0 through 9)
+ <i>n</i>	Font form assignment ( <i>n</i> = 0 through 9)
+N	Form load
+P	Print job
+Q	Print job mixed orientations
+U	Unload all files
+V	Merge page unload
c	Paper tray select
gr	Graphic repeat
gw	Graphic window
m	Page boundary margins. (Double page margins not supported.)
zd	Merge stop
ze	Merge start
zf	Units 300ths

Table 33-4. XES commands supported for XES-to-PCL conversion (Continued)

XES command	Definition
zyd	Duplex start
zye	Duplex stop
zyf	Duplex invert start
zyi	Duplex side select
f	Ink assign
zi	Ink change

## Processing limitations

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When directing an XES document to a PCL-capable printer, restrictions apply to certain elements, including:

- Color
- Licensed fonts
- Fonts stored on the printer
- Printers supported
- Document conversions
- Printer memory

### Color

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When printing DJDE, page-formatted, and AFP documents containing color to PCL-capable printers, documents can be printed on color PCL-capable printers.

### Licensed fonts

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You can use licensed fonts with XPAF and Xerox printers in accordance with the font licensor's shrink-wrap license agreement or executable license agreement which accompanies all licensed font products. If you have any questions regarding the use of any specific font, you should contact the font vendor directly. You are responsible for the proper contractual use of licensed fonts.



**CAUTION:** Printing with a licensed font to a non-Xerox printer may violate your licensing agreement.

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## Fonts stored on the printer

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XPAF downloads all necessary resources each time a PCL job is printed but does not store them on the printer. If you do not have your fonts stored in a native library because your site is set up to store fonts only on a printer (or use cartridge fonts), you must modify your procedure.

When printing an XES document to a PCL-capable printer, if XPAF determines that a requested font is not available in the decentralized font library, then it will be unable to convert the decentralized font to a PCL bitmapped font. Processing will be terminated.

If this error occurs, you must either edit the document to specify a decentralized font that is available in the decentralized font library, or load the requested font to the decentralized font library on the host.



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**NOTE:** When printing banner pages, XPAF uses the default font specified in the PORTFONT or LANDFONT printer profile parameters. The default fonts for PCL-capable printers are P0612A and L0112B, which are supplied in the decentralized font library. If you have changed the values for your default portrait and/or landscape fonts, you may need to update the PORTFONT and/or LANDFONT printer profile parameters to specify fonts that are available in the decentralized font library.

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## Printers supported

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Support for the PCL conversion only applies for documents printed to Xerox printers that support the PCL printer command language.

## Document conversions

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When printing DJDE, page-formatted, and AFP documents to PCL-capable printers, any limitations which exist for the conversion to XES remain in effect. That is, the XES-to-PCL conversion cannot overcome any limitations of the DJDE-to-XES, page format-to-XES, or AFP-to-XES document conversions.

## Printer memory

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These limitations apply to the printer memory for PCL-capable printers:

- When printing documents to a PCL-capable printer, the amount of printer memory required depends upon the application to be printed.
- When a document is sent to a PCL-capable printer, XPAF assumes that the printer has enough memory available to print the document.
- To change the amount of memory currently available on the printer, modify the value specified for the MEMORY printer profile parameter. For more information about this parameter, refer to [Section Five: XPAF Parameter and Keyword Reference](#).
- An application that prints correctly on one printer may cause memory shortages when printed on a different printer. Possible explanations for this difference are:
  - Memory amounts installed on each printer may be different.
  - The unprintable area may not be the same for all printers. Refer to your printer documentation to determine the unprintable area for your printer.

## Troubleshooting problems

Occasionally, your output may not print as you expected. If this happens, review the items in table 33-5 for information to help you resolve the problem.

Table 33-5. Common printing errors for XES documents

Symptom	Explanation	Steps to take
A job containing multiple images fails at the printer.	The printer may not support the number of images contained on the page or may not have enough memory to process the images in your data stream. The number of images per page that can be printed by a printer varies from printer to printer, depending on image complexity and available printer memory.	For specific image limitations, refer to your printer reference manual. Update your document to use images in a manner that your printer can support, or use a different printer to print the document.
When printing to a 4700 printer, data is missing.	The 4700 printer has a non-printable area on the page called a deletion area. If data is positioned in this area, it is not printed. This condition does not produce error messages by XPAF or the printer.	Refer to the printer's manual for the size of the deletion area, then rework the document so that data is not positioned in the 4700 printer's non-printable area.
When printing mixed mode documents (containing both simplex and duplex) to a 4230 or 4220 printer, duplex pages are rotated 180 degrees.	The 4230 and 4220 printers have a printer setup option, Invert Duplex Print Direction, that allows you to change the print orientation for duplex pages. When allowed to default (Disabled), duplex pages are printed in the opposite direction of the simplex pages.	On the printer, change the Invert Duplex Print Direction option to Enabled via the Printer Setup menu, then resubmit the document.
When printing to a 3700 printer, forms are not downloaded correctly.	You may be running the wrong level of software on the printer (2.5-11 through 2.5-18).	Upgrade the printer software to release 2.5-21.

## 34. *Printing page-formatted documents*

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This chapter contains the information you need to print page-formatted documents through XPAF. It addresses these topics:

- Verifying that your resources have been set up correctly
- Including resources in your documents
- Modifying the processing of your documents
- Using advanced features, such as color
- Converting page-formatted documents to other formats

In addition, it provides troubleshooting tips for resolving some of the common problems you may encounter as you print page-formatted documents.

### *Data stream definition*

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Page-formatted documents are line-mode documents that have been formatted into discrete pages using a page format. Refer to [Section Eight: Xerox Page Format Editor User Guide](#) for information about creating and maintaining page formats.



**NOTE:** You cannot use a page format to format a document that contains DJDE, XES, AFP, or PCL commands. These commands are not supported by page-format processing and will produce unexpected results.

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### *XPAF support*

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You can print page-formatted documents through XPAF to any supported centralized, decentralized, or PCL-capable printer.

- For documents sent to a centralized printer, XPAF converts the page-formatted document to a Metacode document.
- For documents sent to a decentralized printer, XPAF converts the page format settings to XES commands.
- For documents sent to a PCL-capable printer, XPAF converts the page format settings to XES commands, then converts the XES commands to PCL commands.

## Preparing resources

For page-formatted documents, there are tasks related to resource preparation that you need to complete before you submit jobs for printing. Before you begin printing documents, contact the system administrator responsible for maintaining your print resources to ensure that the applicable tasks have been completed.



**NOTE:** These tasks are summarized in table 34-1 and described in detail in *Section Three: Managing Resources with XPAF*, and *Section Eight: Xerox Page Format Editor User Guide*.

Table 34-1. Resource preparation for page-formatted documents

Resource type	User actions needed	Print time processing
Fonts	For any document using licensed fonts that you want to print to a decentralized printer, obtain a decentralized version of the licensed fonts from either Xerox Font Services or a third-party vendor.	XPAF cannot convert licensed centralized fonts to decentralized format. If XPAF cannot locate a licensed decentralized version of the font in the native font library, document processing will be terminated.
	Load any centralized or decentralized fonts you have purchased from Xerox Font Services or a third-party vendor to the appropriate native font libraries.	XPAF will download fonts from the native font library if they have not been included inline or if they are not resident on the printer.
	<p>Before you convert a centralized font that you have purchased from either Xerox Font Services or a third-party vendor to decentralized format, update the applicable font tables as needed:</p> <ul style="list-style-type: none"> <li>• Ensure that the XPAFXFI table entry for the centralized font contains valid centralized and decentralized mapping table names.</li> <li>• Verify that all expected character IDs exist in the centralized character mapping table, and that the character IDs in the decentralized character mapping table are mapped to the desired code point and plane number combination.</li> </ul>	During centralized-to-decentralized conversion, XPAF uses the centralized and decentralized mapping tables to determine where to place the centralized characters in the decentralized font.

Table 34-1. Resource preparation for page-formatted documents (Continued)


Resource type	User actions needed	Print time processing
Fonts (continued)	<p>Convert a centralized font to decentralized format if you do not have a decentralized version of the font, but want to use the same font in documents printed to both centralized and decentralized printers.</p>  <p><b>NOTE:</b> All fonts included with XPAF, except language-specific R03 fonts, are provided in both centralized and decentralized format, so preconversion is not necessary for these fonts. However, you must preconvert language-specific R03 centralized fonts to decentralized format.</p>	XPAF does not dynamically convert centralized fonts to decentralized format. If you do not preconvert the font, document processing will be terminated.
	Create a resident font list for each channel-attached non-XNS centralized printer, remotely-attached centralized printer, and decentralized printer.	<p>XPAF will check the printer's font list to determine whether a requested font is resident on the printer. If the font is not resident, XPAF will download it.</p> <p>If the printer can store downloaded resources permanently, XPAF will update the printer's font list when it downloads a font.</p>
	Convert Xerox font characteristics to ensure that the EBCDIC-to-ASCII (XPAFE2A) and EBCDIC font widths (XPAFEFW) tables are updated with the necessary entries.	When printing to either a centralized or decentralized printer, XPAF will use centralized font dimensions from the XPAFE2A and XPAFEFW tables to position characters on the page.
Forms	Load your centralized forms to the appropriate centralized native form libraries.	XPAF will download forms from the native form library if they are not resident on the printer.
	Create a resident form list for each channel-attached non-XNS centralized printer, remotely-attached centralized printer, and decentralized printer.	<p>XPAF will check the printer's form list to determine whether a requested form is resident on the printer. If the form is not resident, XPAF will download it.</p> <p>If the printer can store downloaded resources permanently, XPAF will update the printer's form list when it downloads a form.</p>

Table 34-1. Resource preparation for page-formatted documents (Continued)

Resource type	User actions needed	Print time processing
Images	Load your centralized and decentralized images to the appropriate native image libraries.	XPAF will download images from the native image library if they are not resident on the printer.
	Create a resident image list for each channel-attached non-XNS centralized printer, remotely-attached centralized printer, and decentralized printer.	XPAF will check the printer's image list to determine whether a requested image is resident on the printer. If the image is not resident, XPAF will download it.  If the printer can store downloaded resources permanently, XPAF will update the printer's image list when it downloads an image.
Logos	Load centralized logos to the native logo library.	XPAF will download logos from the native logo library if they are not resident on the printer.
	Convert centralized logos to decentralized fonts for printing on decentralized printers.	XPAF does not dynamically convert centralized logos to decentralized fonts. If you do not preconvert the logo, document processing will be terminated.
	Create a resident logo list for each channel-attached non-XNS centralized printer and remotely-attached centralized printer.	XPAF will check the printer's logo list to determine whether a requested logo is resident on the printer. If the logo is not resident, XPAF will download it.  If the printer can store downloaded resources permanently, XPAF will update the printer's logo list when it downloads a logo.
Color	Use the XPAF Edit Line Data Specifications option in the Xerox page format editor to specify colorized text for individual fields or lines of data.  For highlight color only, create color cross-reference tables to map the ink color specified in a page-formatted document to the ink color loaded on the highlight color printer.	XPAF will print the text using the color specifications for the page format.  When printing to a centralized highlight color printer, XPAF will look in the specified color cross-reference table to determine the color of ink to use.
Paper trays	Ensure that the cluster names are valid for the printer on which the document will be printed.	During page format-to-Metacode conversion, XPAF translates input trays 3 through 9 to TRAY3 through TRAY9.

Table 34-1. Resource preparation for page-formatted documents (Continued)

Resource type	User actions needed	Print time processing
PDL	Load your PDL files to the native PDL libraries. You must ensure that the PDL members compiled on the printer are identical to those loaded to the native PDL libraries, or your results will be unpredictable.	XPAF will use the values in the specified PDL files to help determine the format and processing requirements for the document.
Page formats	Create and generate a page format using the Xerox page format editor.	XPAF will use the parameters defined by the page format to determine how to format line-mode data streams.

## Using resources

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For page-formatted documents, the fonts, forms, images, and logos you specify in your document can be:

- Resident on a centralized printer
- Downloaded from an XPAF resource library at print time

The following sections contain information about page format options you can use to specify resources and extended JCL keywords you can use to update resources at print time.

For detailed information about a particular keyword, refer to [Section Five: XPAF Parameter and Keyword Reference](#). For information about creating page formats, refer to [Section Eight: Xerox Page Format Editor User Guide](#). For information about using PDL to include resources in a document, refer to your centralized printer's reference manual.

## Specifying

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There are no extended JCL keywords available for specifying the fonts, forms, images, and logos in your page-formatted documents. Instead, these resources must already have been specified in the page format.

### Fonts

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When creating or editing a page format in XPAF, you can specify a Xerox font in the page layout using any of these options:

- Edit line data specifications — Specifies the font to be used for each line group.
- Edit a field format — Specifies the font to be used for each field format.
- Edit a font list — Specifies a list of up to 127 fonts to be used in the document. A font list must be used in conjunction with font indexing in the input data stream.

If you are using a font list in the page format and font indexing in the input data stream to select the fonts for a document, you must include the TRC=YES or the DCB option OPTCD=J in the standard IBM JCL used to submit the job. This instructs the system to recognize the font index byte in the input data stream.

## Forms

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When creating or editing a page format in XOAF, you can specify centralized forms in these fields of a copy modification:

- 'Form Name for Front' — Specifies the form to be included on the front of each page.
- 'Form Name for Back' — For duplex documents, specifies the form (with data) to be included on the back of each page.
- 'BFORM Name' — For duplex documents, specifies the form (without data) to be included on the back of each page.



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**NOTE:** Forms must be in .FRM format. XPAF dynamically converts .FRM forms to internal XPAF format if you send a document to a decentralized printer. The converted form is stored in the library referenced by either the DFORMLIB initialization parameter or the FORMLIB printer profile parameter. XPAF does not generate an XES form, and you cannot reference XES forms in page-formatted documents.

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## Images

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To specify an image, you must reference it in a form.

## Logos

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To specify a logo, you must reference it in a form.

## Revising

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If your site has created or received a new version of a resource and loaded it to the appropriate XPAF native resource library, the version in the library may no longer match the version on the printer.

For data streams that reference Xerox native resources, you can specify AUTOREV=XEROX in your initialization parameters or the printer's profile to ensure that your document is printed using the most current version of the resource.

To ensure that your document is printed using the most current version of the resource, include the appropriate REVxxxxx extended JCL keyword(s) in the JCL used to submit the job:

- REVFONT
- REVFORM
- REVIMAGE
- REVLOGO

REVxxxxx downloads the specified resource to the printer. Then, for centralized and decentralized printers that are capable of permanently storing resources, the resource is stored on the printer so it will be available for subsequent jobs. For centralized printers only, if you also have specified the equivalent DELxxxxx printer profile parameter or extended JCL keyword (DELFONT, DELFORM, DELIMAGE, or DELLOGO), the resource will not be stored on the printer.

## Deleting

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You may not want to keep all your resources resident on a printer. Some reasons why you might want to delete them from the printer include:

- **Testing.** If you are testing a new version of a font, form, image, or logo, you may not want to store it until you are certain it is the version you plan to use.
- **Security.** If you want to ensure that a particular resource (such as a licensed font or signature logo) cannot be copied from the printer, you should not store it on the printer.
- **Limited printer disk space.** If you have limited storage on your printer, you can delete resources to increase the amount of space available.

For centralized printers only, you can print a specific document without storing one or more of its resources on the printer. To do this, use the appropriate DELxxxxx extended JCL keyword(s):

- DELFONT
- DELFORM
- DELIMAGE
- DELLOGO

Each of these keywords downloads the specified resource(s) to the printers, then after the document is printed, it deletes them from the printer so that they will no longer be available.



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**NOTE:** You can include the DELxxxxx parameter(s) in the centralized printer's profile to specify that for all documents, the resources that are downloaded will be deleted from the printer after use.

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## Modifying document processing

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There are several document features you can change using XPAF-supplied parameters and keywords. This section identifies some of the keywords available in XPAF to change document processing. Refer to [Section Five: XPAF Parameter and Keyword Reference](#) for information about the keywords identified in this section and for other XPAF keywords available for page-formatted document processing.

Table 34-2. Extended JCL keywords for page-formatted processing

Extended JCL keyword	Function
DUPLEXSW	For centralized printers only, specifies whether the plexing mode on the printer will switch between simplex and duplex mode for a document.
JDE	Identifies the JDE to be used for the document.
JDL	Identifies the JDL to be used for the document.
PAGEFORM	Identifies the page format to be used for this document.
PAPERSIZ	Specifies the paper size to be used for this document. The paper loaded in the tray from which the job feeds must be the same size as you specify using this keyword.

## Using advanced features

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Through XPAF, you can print page-formatted highlight color documents to both highlight and full color printers. If your printer is equipped with finishing equipment, you can use Document Finishing Architecture (DFA) interface support.

### Highlight color and full color

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Color specifications for page-formatted documents can be set up only within a page format.

#### Specifying colors

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When creating or editing a page format in XOAF, you can specify colors using these page layout options:

- Edit line data specifications — Specifies the color to be used for each line group.
- Edit a field format — Specifies the color to be used for each field format.

You can specify up to nine different colors, including DEF to indicate the default color set up for the printer.

#### Using extended JCL keywords

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When printing to a highlight color printer, you can use extended JCL keywords to specify which color cross-reference table to use and the library where the table is stored. XPAF uses the color cross-reference table to map the color(s) specified in the document to the ink color loaded on the printer.

XPAF does not use color cross-reference tables when printing to a 4700 printer; instead, it passes the color requests directly to the printer.

Table 34-3. Color-specific extended JCL keywords

Extended JCL keyword	Function
INKXLIB	Identifies the name of the library where the color cross-reference tables are stored.
INKXREF	Identifies the name of the color cross-reference table, and optionally, alters the color cross-references within the table for the current document only.

## Document finishing

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You can use XPAF features to control some aspects of document finishing, including:

- Stapling
- Setting the finishing boundary
- Selecting paper trays

### Stapling

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For centralized printers that support stapling, you can staple documents by specifying the JDE extended JCL keyword. The JDE/JDL pair must reference a JDE with stapling in effect.

XPAF provides a sample JDE called PGSTAP in XPFSAMP member DFAULT. You can use your own JDE if you wish. The JDE must contain statements similar to these:

```
VOLUME CODE=NONE;  
OUTPUT STAPLE=YES,NT01=YES,FACEUP=YES;
```

The JDE must be loaded into your PDL library on the host, downloaded to the printer, and compiled.

### Setting the finishing boundary

---

For centralized printers only, you can specify a finishing boundary for a document if your printer supports the DFA interface (version 4.1 or higher). The output is finished at the copy modification's boundary.

To specify a finishing boundary, perform these steps:

- Step 1.** Ensure that the printer's profile specifies FEATURE=DFA.
- Step 2.** If you want to split the output between copy modifications for document finishing purposes, use the Xerox page format editor to specify YES in the 'Split Report' field for the appropriate copy modification in the page format.
- Step 3.** If you want XPAF to send DJDEs to the printer to raise (that is, turn on) or lower (that is, turn off) signal function 1 and/or signal function 2 for finishing purposes, use the Xerox page format editor to specify YES or NO in the 'Signal Function 1' and/or 'Signal Function 2' fields in the appropriate copy modification in the page format.



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**NOTE:** XPAF does not determine the function of signal function 1 and signal function 2; the signal's function is defined by the third-party finishing equipment. Refer to the finishing equipment documentation supplied by your third-party vendor for more information about the equipment's use of signal functions.

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- Step 4.** Generate the page format. For more information about creating or updating copy modifications and generating page formats, refer to [Section Eight: Xerox Page Format Editor User Guide](#).
- Step 5.** Specify the page format in the JCL used to submit the job.



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**NOTE:** If you want to vary the DFA signal for different portions of a document, you can use conditional formatting parameters in the page format. Create a separate copy modification to activate each set of signals that you need, and add conditional processing to the page layout to control copy modification selection.

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## *Selecting paper trays*

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When creating or editing a page format in XOAF, you can use these fields of a copy modification to select the paper source:

- 'Tray Number' — Specifies the number of the paper tray to be used as the paper source.
- 'Cluster Name' — For centralized printers only, identifies one or more paper trays that are loaded with the same type of paper.

## *Verifying your print environment*

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This section identifies any additional steps you should take before you begin submitting jobs.

### *Region size*

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To process page-formatted data streams with XPAF, make sure the region size defined in the XOSF start-up proc (XOSF00) is set to at least 6144K.

## *Printing documents*

---

Submit your documents for printing using standard JCL. Ensure that:

- Your job class references a supported centralized, decentralized, or PCL-capable printer
- You specify the page format to be used for the document via the PAGEFORM extended JCL keyword

## Converting page-formatted documents to other formats

If you direct your page-formatted documents to a decentralized printer, XPAF will convert the page format commands to XES commands.

If you direct your document to a PCL-capable printer, the page format commands will be converted to XES commands, then the XES commands will be converted to PCL. Refer to chapter 33, ["Printing XES documents"](#) for information about the XES-to-PCL conversion.

## Troubleshooting problems

Occasionally, your output may not print as you expected. If this happens, review the items in table 34-4 for information to help you resolve the problem.

Table 34-4. Common printing errors for page-formatted documents

Symptom	Explanation	Steps to take
A job containing multiple images fails at the printer.	The printer may not support the number of images contained on the page or may not have enough memory to process the images in your data stream. The number of images per page that can be printed by a printer varies from printer to printer, depending on image complexity and available printer memory.	For specific image limitations, refer to your printer reference manual. Update your document to use images in a manner that your printer can support, or use a different printer to print the document.
Job attempts to print outside the valid printable area.	XPAF processing may produce slight rounding and processing differences.	Avoid printing any text, rules, and images within 1/8 inch of the edge of the valid printable area.
Document does not print in duplex as expected.	You may not have specified YES for the 'Duplex Mode' field of a copy modification in the page format, or you may have included the DUPLEXSW extended JCL keyword in the JCL used to submit the job.	Check the copy modification to verify that the 'Duplex Mode' field specifies YES.  Review the JCL to determine whether DUPLEXSW was in effect, and add or remove it if necessary.
Your printed output contains extra spaces.	The data for your page-formatted document contains undefined code points. XPAF substitutes a space character for each undefined code point.	Edit the data to remove the undefined code points.

Table 34-4. Common printing errors for page-formatted documents (Continued)

Symptom	Explanation	Steps to take
A back shift value was specified in the copy modification, but has not been applied to the document.	If a document includes both front and back shift values and is being sent to a decentralized simplex only printer, XPAF applies only the front shift value to every page of the document. This prevents text from being printed in the binding margin.	Print the document to a duplex-capable printer if you want the back shift value to take effect.
When printing to a 4700 printer, data is missing.	The 4700 printer has a non-printable area on the page called a deletion area. If data is positioned in this area, it is not printed. This condition does not produce error messages by XPAF or the printer.	Refer to the printer manual for the size of the deletion area, then rework the document so that data is not positioned in the 4700 printer's non-printable area.
Forms are not positioned correctly when printed to a 4235 or 3700 printer.	If you compile a form on a centralized printer running version 10 software, you generate a version 1 form. Version 1 forms do not contain edge-marking (margin) values.  When XPAF converts a version 1 form from centralized to decentralized format, it sets the margins to the maximum supported paper size. On 4235 and 3700 printers, this may result in positioning errors when the form is printed.	Check the header record of the form to determine if it is a version 1 form. If so, there are two methods of correcting the error: <ul style="list-style-type: none"> <li>On a printer running software version 2.1 or greater, recompile the original version 1 form to generate a version 2 form.</li> <li>Set the default margins at the printer to the maximum supported paper size.</li> </ul>
A print job using a large number of fonts fails at the printer when directed to a centralized printer or 4235 printer in XPPM mode.	The printer was not set up to handle the number of fonts specified in the document.	If your document contains a large number of fonts, verify that the printer FONTS command is set to at least 64. For example, at the printer console, you could enter:  FONTS 64  The maximum number of fonts allowed is 128.
When printing mixed mode documents (containing both simplex and duplex) to a 4230 or 4220 printer, duplex pages are rotated 180 degrees.	The 4230 and 4220 printers have a printer setup option, Invert Duplex Print Direction, that allows you to change the print orientation for duplex pages. When allowed to default (Disabled), duplex pages are printed in the opposite direction of the simplex pages.	On the printer, change the Invert Duplex Print Direction option to Enabled via the Printer Setup menu, then resubmit the document.
When printing to a 3700 printer, forms are not downloaded correctly.	You may be running the wrong level of software on the printer (2.5-11 through 2.5-18).	Upgrade the printer software to release 2.5-21.

## 35. *Printing AFP documents*

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This chapter contains the information you need to print AFP documents through XPAF. It addresses these topics:

- Verifying that your resources have been set up correctly
- Including resources in your documents
- Modifying the processing of your documents
- Using advanced features, such as color
- Converting AFP documents to Metacode or XES documents

In addition, it provides troubleshooting tips for resolving some of the common problems you may encounter as you print AFP documents.

### *Data stream definition*

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AFP documents may consist of:

- Sequences of variable-length records called structured fields
- Fixed- or variable-length records that contain both line-mode data and structured fields
- Line-mode data formatted using AFP JCL keywords

AFP software makes use of all-points addressability to print data streams containing text, forms (known in AFP as overlays), and images. Different data types can be mixed and oriented in different directions on a page.

AFP documents can be created and printed using IBM software products such as:

- Document Composition Facility (DCF)
- Graphical Data Display Manager (GDDM)
- Overlay Generation Language (OGL)
- Page Printer Formatting Aid (PPFA)
- Print Services Access Facility (PSAF)

## XPAF support

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You can print AFP documents through XPAF to any supported centralized, decentralized, or PCL-capable printer:

- For documents sent to a centralized printer, XPAF converts the AFP document to a Metacode document.
- For documents sent to a decentralized printer, XPAF converts the AFP document to an XES document.
- For documents sent to a PCL-capable printer, XPAF converts the AFP document to an XES document, then converts the XES document to a PCL document.

## Preparing resources

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For AFP documents, there are tasks related to resource preparation that you need to complete before you submit jobs for printing. Before you begin printing documents, contact the system administrator responsible for maintaining your print resources to ensure that the applicable tasks have been completed.



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**NOTE:** These tasks are summarized in table 35-1 and described in detail in [Section Three: Managing Resources with XPAF](#).

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Table 35-1. Resource preparation for AFP documents



Resource type	User actions needed	Print time processing
Fonts	<p>Install any custom replica fonts you have purchased from either Xerox Font Services or a third-party vendor to the appropriate native font libraries.</p> <p> <b>NOTE:</b> IBM custom character sets are not supported.</p>	XPAF will download fonts from the native font library if they are not resident on the printer.
	<p>Convert a centralized font to decentralized format if you do not have a decentralized version of the font, but want to use the same font in documents printed to both centralized and decentralized printers.</p> <p> <b>CAUTION:</b> Inverse portrait and inverse landscape centralized replica fonts cannot be converted to decentralized fonts. Decentralized inverse portrait and inverse landscape fonts are actually portrait and landscape fonts with the rasters inverted. When these fonts are converted for use with AFP documents they will be positioned incorrectly in your document. You must obtain the correct versions of these fonts from Xerox Font Services or a third-party vendor.</p>	XPAF does not dynamically convert centralized fonts to decentralized format. If you have not preconverted the font, document processing will be terminated.
	<p>Create a resident font list for each channel-attached centralized printer, remotely-attached centralized printer, and decentralized printer.</p>	<p>XPAF will check the printer's font list to determine whether the requested font is resident on the printer. If the font is not resident, XPAF will download it.</p> <p>If the printer can store downloaded resources permanently, XPAF will update the printer's font list when it downloads a font.</p>

Table 35-1. Resource preparation for AFP documents (Continued)

Resource type	User actions needed	Print time processing
Fonts (continued)	Update your IBM font characteristics information if you have changed an IBM coded font or added new fonts to your IBM library. This ensures that your XPAF font tables are in synchronization with your IBM font library.	XPAF will use various font tables to determine which fonts to use for printing.
	Convert Xerox fonts to IBM format if you plan to use them in a DCF/SCRIPT document. This conversion creates an IBM look-alike version of the font that DCF recognizes. If you use an IBM code page with this font, the code page must reside in the same library in which the converted font is stored.	XPAF will use various font tables to determine which fonts to use for printing.
	For any Xerox fonts you plan to use in a DCF document, update the logical device table (LDT), the physical device table (PDT), and the Generalized Markup Language (GML) profile.	XPAF will use various font tables to determine which fonts to use for printing.
	Verify that you have the Xerox fonts XGT50L and XGT50P in your native font library or on the printer.	XPAF will use these fonts to specify the orientation for the AFP document.
Forms	Create a resident form list for each channel-attached non-XNS centralized printer, remotely-attached centralized printer, and decentralized printer.	<p>XPAF will check the printer's form list to determine whether a requested form is resident on the printer. If the form is not resident, XPAF will download it.</p> <p>If the printer can store downloaded resources permanently, XPAF will update the printer's form list when it downloads a form.</p>

Table 35-1. Resource preparation for AFP documents (Continued)

Resource type	User actions needed	Print time processing
Images	Convert your IBM AFP page segments to centralized or decentralized format.	If you do not preconvert an IBM AFP page segment, XPAF will dynamically convert it to centralized or decentralized format at print time.
	Convert IM-type images colorized via the IID structured field to monochrome .IMG, monochrome RES .IMG, and/or two-color RES .IMG format.	If you do not preconvert an IM-type image, XPAF will dynamically convert it to monochrome .IMG, monochrome RES .IMG, and/or two-color RES .IMG format based on the color of the image, the destination printer selected, the value specified for the PRINTENV initialization parameter, and whether the image will be stored in the centralized image library.
	Create a resident image list for each channel-attached non-XNS centralized printer, remotely-attached centralized printer, and decentralized printer.	XPAF will check the printer's image list to determine whether a requested image is resident on the printer. If the image is not resident, XPAF will download it.  If the printer can store downloaded resources permanently, XPAF will update the printer's image list when it downloads an image.
Logos	None.	Not applicable. You cannot specify logos in AFP documents.
Color	(Optional) For highlight color processing, create color cross-reference tables to match the requests for color specified within composed text pages or PAGEDEFs to a color supported by the highlight color printer.	XPAF will look in the specified color cross-reference table to determine the color of ink to use for the text. This table cross-references IBM ink color names to Xerox ink color names.
	For full color processing: None.	Text colors that are coded in AFP documents will be passed through directly to the 4700 printer and PCL color printers.

Table 35-1. Resource preparation for AFP documents (Continued)

Resource type	User actions needed	Print time processing						
Paper trays	For AFP-to-Metacode conversion: Ensure that the cluster names are valid for the printer on which the document will be printed.	<p>XPAF uses the bin number specified in the MMC structured field to generate a DJDE FEED command. If you have specified a varying paper size table, XPAF will use the values from that table. Otherwise, XPAF uses these values:</p> <table><tr><td>Bin 1</td><td>MAIN</td></tr><tr><td>Bin 2</td><td>AUX</td></tr><tr><td>Bins 3–9</td><td>TRAY3–TRAY9</td></tr></table> <p>XPAF processing makes these assumptions:</p> <ul style="list-style-type: none"><li>• The required paper is loaded in the correct tray(s) on the printer.</li><li>• The selected printer supports the requested paper size (or output may be unpredictable).</li></ul>	Bin 1	MAIN	Bin 2	AUX	Bins 3–9	TRAY3–TRAY9
	Bin 1	MAIN						
Bin 2	AUX							
Bins 3–9	TRAY3–TRAY9							
	For AFP-to-XES and AFP-to-PCL conversion: None.	<p>If you have specified a varying paper size table, XPAF will use the values from that table. Otherwise, XPAF uses these values:</p> <table><tr><td>Bin 1</td><td>MAIN</td></tr><tr><td>Bin 2</td><td>AUX</td></tr><tr><td>Bins 3–9</td><td>TRAY3–TRAY9</td></tr></table> <p>XPAF processing makes these assumptions:</p> <ul style="list-style-type: none"><li>• The required paper is loaded in the correct tray(s) on the printer.</li><li>• The selected printer supports the requested paper size (or output may be unpredictable).</li></ul> <p>Refer to Chapter 19, “<a href="#">XPAF tables</a>” in <a href="#">Section Three: Managing Resources with XPAF</a> for the tray select commands issued by XPAF to decentralized and PCL-capable printers. These commands are based on whether the primary or auxiliary feed is used and the paper name specified in PAPERSIZ initialization parameter, printer profile parameter, or extended JCL keyword.</p>	Bin 1	MAIN	Bin 2	AUX	Bins 3–9	TRAY3–TRAY9
Bin 1	MAIN							
Bin 2	AUX							
Bins 3–9	TRAY3–TRAY9							
PDL	For AFP-to-Metacode conversion: Load your PDL files to the native PDL libraries. You must ensure that the PDL members compiled on the printer are identical to those loaded to the native PDL libraries, or your results will be unpredictable.	XPAF will use the values in the specified PDL files to help determine the format and processing requirements for the document.						

## Using resources

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For AFP documents, the fonts, overlays, page segments, and images you specify in your document can be:

- Resident on the printer. Printer-resident resources can be specified using AFP commands or standard IBM JCL keywords.
- Downloaded from an XPAF resource library at print time.

The following sections contain information about AFP commands and extended JCL keywords you can use to specify and update resources at print time. For detailed information about a particular keyword, refer to [Section Five: XPAF Parameter and Keyword Reference](#).

## Specifying

---

XPAF provides a number of extended JCL keywords which you can use to specify fonts, forms, and images in your AFP documents.

### Fonts

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The procedure for selecting fonts varies depending on whether you are printing composed text or line data:

- For an AFP composed text document, you specify either IBM or Xerox fonts using the DCF font definition commands.
- For an AFP line data document, you specify IBM fonts in a PAGEDEF or using standard IBM JCL.

If a document specifies IBM fonts, XPAF automatically uses replicas of the IBM fonts in the document. The replica fonts are initially stored on the host. The first time they are specified for a document, the replica fonts are downloaded to the printer.

### Banner page default fonts

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Standard XPAF banner and trailer pages for AFP jobs use the C1D0GT15 character set and the T1D0BASE code page by default. If your AFP font library does not contain these members, you must either add them to the AFP font library or modify the banner page user exit 05.

If you have modified these members, you also may need to modify the banner page user exit 05. Refer to [Section Two: Installing and Customizing XPAF](#) for more information on modifying user exit 05.

## Support for IBM fonts

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XPAF supports all of the IBM font directions and rotations, including column text where the characters are rotated 90 or 270 degrees from the baseline. However, due to Xerox font design constraints, characters that do not appear in the center of the character cell may appear misplaced when printed in column format. The misplacement is especially apparent with non-uppercase characters (lowercase and special characters). Variable-pitch fonts may also exhibit undesirable placement when printed in column format.




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**NOTE:** For the best appearance, Xerox recommends using only uppercase, fixed-pitch fonts when printing column text.

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## AFP 300 dpi relative metrics type fonts

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Text placement within XPAF occurs at AFP transform time, and not at font conversion time. In order to improve text placement for 300 dpi type fonts, XPAF font conversion processing saves the original IBM font metric information for use by the AFP transform XAM (centralized) and XAU (decentralized) components.

## Overlays

---

You can include an IBM overlay in an AFP document by referencing it in one of these ways:

- In a FORMDEF.
- In an IPO structured field.
- Using the .OI command, if you are running SCRIPT/VS at level 1.4.0 or above. For more information about the .OI command, refer to the *Document Composition Facility: SCRIPT/VS Language Reference Guide*.

## Dynamic conversion

---

XPAF automatically converts overlays to .FRM file format the first time they are referenced and stores them in the centralized form library with a 20-character member name. The last six characters of this member name are used as the form name on the printer.

Overlays are not converted again unless so requested through the REVOVLY extended JCL keyword. Converted overlays do not reside on decentralized or PCL-capable printers, but do remain resident on centralized printers.

If a native form in your centralized form library has the same name as an overlay in an AFP data stream, XPAF uses the native form rather than converting the overlay to Xerox format.

For example, you can add a Xerox form named TEST to your centralized form library. If one of your AFP data streams includes an overlay named O1TEST, XPAF does not convert O1TEST to Xerox format and store it in centralized form library. Instead, XPAF processes the data stream using the Xerox native form TEST. See the UNIQNAME initialization parameter in [Section Five: XPAF Parameter and Keyword Reference](#) for information on generating a unique form name.

### [\*Error reporting for preconverted overlays\*](#)

---

Errors detected during overlay conversion are only reported at the time of conversion. If you have already converted an overlay, no error messages are displayed if you resubmit the document with DATAACK=UNBLOCK unless you specify the REVOVLY extended JCL keyword.

### [\*Page segments\*](#)

---

You can include an IBM page segment in an AFP document in one of these ways:

- As an inline resource
- By referencing it in an IPS structured field (either in an overlay or inline)

### [\*Dynamic conversion\*](#)

---

XPAF automatically converts page segments to images the first time they are referenced and stores them in the appropriate native image library. Page segments are not converted again unless so requested through the REVPSEG extended JCL keyword. Converted page segments do not reside on decentralized or PCL-capable printers, but do reside on centralized printers.

### [\*Images\*](#)

---

You can include an image in an AFP document in one of these ways:

- Inline
- By referencing it in an overlay
- By referencing it in a page segment

If a page, overlay, or page segment contains or references multiple images, XPAF performs image consolidation to enhance performance. Refer to [“Image consolidation”](#) later in this chapter for information about image consolidation.

### Dynamic conversion

---

For printing on a Xerox printer, all AFP images can be converted to 300 dpi resolution. You should request conversion as follows:

- For IOCA-encoded images of any resolution, specify IMGTYPE=1 in the initialization parameters, printer's profile, or JCL to request conversion to 300 dpi.
- For all other AFP images (either inline, page segment, or referenced in an overlay), specify IMGTYPE=1 in the initialization parameters, printer's profile, or JCL to request conversion from 240 to 300 dpi. This preserves the original size of the image when printed.
- For all images already at 300 dpi, specify IMGTYPE=0 in the initialization parameters, printer's profile, or JCL to avoid conversion of the image dimension. The image position will still be scaled by 25% to ensure that the image prints in the correct relative location on the page. The size of the converted image will print smaller in XPAF (by a factor of 20%) than the original 240 dpi image printed in AFP.

For some IM-type images, image dimension scaling does occur when you specify IMGTYPE=0. For example, non-page segment images that include shading are scaled. For these exceptions, image dimension scaling is increased by a factor of 25%.

- For images to be scaled based on the L-units value in the IDD or IID structured field of the image, specify IMGTYPE=3 in the initialization parameters, printer's profile, or JCL to request conversion of the image dimension and image position to 300 dpi. IOCA-encoded images are scaled from any L-units value to 300 dpi. For IM-type images, any L-units value that does not specify 300 dpi is assumed to be 240 dpi.

You must specify IMGTYPE=3 for documents that contain images at different resolutions. Otherwise, the images will not print at the correct size and position at 300 dpi.

### Storing converted images

---

XPAF stores the converted image in the native centralized image library unless:

- The image is inline.
- The NOSTORE initialization or printer profile parameter is set to Y (yes).
- The image was retrieved from a user library via the USERLIB IBM JCL keyword.

## IOCA image support

---

XPAF can process black-and-white (bilevel) images that are defined by IBM's Image Object Content Architecture (IOCA). XPAF supports these IOCA compression algorithms:

- IBM MMR
- No compression
- G3 one-dimensional
- G3 two-dimensional
- G4 two-dimensional

You can include IOCA-encoded images in your page segment library.

For more information about IOCA, refer to the IBM publication *Image Object Content Architecture Reference*.

## Revising

---

If a new version of a resource is updated in the appropriate AFP resource library or loaded to the appropriate XPAF native resource library, the new version in the library may no longer match the version on the printer. Using automatic revision of resources or selective revision of resources ensures that your document is printed using the most current version of the resource.

When processing AFP applications, XPAF examines the ISPF statistics field for the IBM PDS members to identify changes to those members since the last XPAF conversion.

## Automatic revision

---

For automatic revision of resources, specify one of the following in your initialization parameters or the printer's profile:

- For environments that reference AFP resources, you can specify AUTOREV=AFP.
- For environments that reference Xerox native resources, you can specify AUTOREV=XEROX.
- For environments that reference AFP and Xerox native resources, you can specify AUTOREV=BOTH.



**NOTE:** If you change the color in the IID structured field for an AFP resource image, you must use automatic revision of AFP resources to reconvert the image. Otherwise, the existing image will be printed instead of the updated image.

---

For more information on automatic revision of AFP and Xerox native resources, refer to [Section Three: Managing Resources with XPAF](#) and [Section Five: XPAF Parameter and Keyword Reference](#).

## Selective revision

---

For selective revision of resources, include the appropriate REVxxxxx extended JCL keyword(s) in the JCL used to submit the job:

- REVFONT
- REVFORM
- REVIMAGE
- REVOPSEG
- REVOVLY
- REVPSEG

REVxxxxx downloads the specified resource to the printer. Then, for centralized and decentralized printers that are capable of permanently storing resources, the resource is stored on the printer so it will be available for subsequent jobs. For centralized printers only, if you also have specified the equivalent DELxxxxx printer profile parameter or extended JCL keyword (DELFONT, DELFORM, or DELIMAGE), the resource will not be stored on the printer.




---

**NOTE:** If you change the color in the IID structured field for an AFP resource image, you must specify the REVOVLY or REVPSEG extended JCL keyword to reconvert the image. Otherwise, the existing image will be printed instead of the updated image.

---

## Deleting

---

You may not want to keep all your resources resident on a printer. Some reasons why you might want to delete them from the printer include:

- Testing. If you are testing a new version of a font, form, or image, you may not want to store it until you are certain it is the version you plan to use.
- Security. If you want to ensure that a particular resource (such as a licensed font) cannot be copied from the printer, you should not store it on the printer.
- Limited printer disk space. If you have limited storage on your printer, you can delete resources to increase the amount of space available.

For centralized printers only, you can print a specific document without storing one or more of its resources on the printer. To do this, use the appropriate DELxxxxx extended JCL keyword(s):

- DELFONT
- DELFORM
- DELIMAGE

Each of these keywords downloads the specified resource(s) to the printer. Then after the document is printed, it deletes them from the printer so that they will no longer be available.




---

**NOTE:** For centralized printers only, you can include the DELxxxxx parameter(s) in the printer's profile to specify that for all documents, the resources that are downloaded will be deleted after use.

---

## Modifying document processing

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There are many document features you can change using XPAF-supplied parameters and keywords. This section identifies some of the keywords available in XPAF to change document processing. Refer to [Section Five: XPAF Parameter and Keyword Reference](#) for information about the keywords identified in this section and for other XPAF keywords available for AFP processing.

Table 35-2. Extended JCL keywords for AFP processing

Extended JCL keyword	Function
XDUPLEX	For documents that have simplex copy groups within a FORMDEF, overrides the duplexing option specified in the FORMDEF.
DUPLEXSW	For centralized printers only, specifies whether the plexing mode on the printer will switch between simplex and duplex for a document.
JDE	Identifies the JDE to be used for the document.
JDL	Identifies the JDL to be used for the document.
MERGEVL	Indicates whether multiple overlays within a copy group will be consolidated.
PMODE	Specifies the hardware page origin (printing orientation). PMODE keyword settings are equivalent to the IBM PSF medium orientation.
XSHADE	Specifies whether to enhance cells within AFP images that are recognized as a shading pattern.

## AFP structured fields

Table 35-3 identifies the structured fields that are honored by XPAF. This table does not list any structured fields that are either not applicable or not honored.

Table 35-3. AFP structured fields honored by XPAF

Structured field	Description	Limitations
BAG	Begin Active Environment Group	
BCF	Begin Coded Font	
BCP	Begin Code Page	
BDG	Begin Document Environment Group	
BDM	Begin Data Map	
BDT	Begin Document	Optional triplets are not processed.
BDX	Begin Data Transmission Subcase	
BFM	Begin Form Map	
BFN	Begin Font	
BIM	Begin Image Object (IOCA and IM images)	
BMM	Begin Medium Map	
BMO	Begin Medium Overlay	Optional triplets that define origin, date and time of creation, and security are ignored.
BOG	Begin Object Environment Group	
BPG	Begin Page	
BPM	Begin Page Map	
BPS	Begin Page Segment	Optional triplets that define origin, date and time of creation, and security are ignored.
BPT	Begin Presentation Text Block	
BR	Begin Resource	This structured field is processed only for inline FORMDEFs and PAGEDEFs. No other inline resources are supported.
BRG	Begin Resource Group	Optional triplets are not processed.
CCP	Conditional Processing Control	
CFC	Coded Font Control	

Table 35-3. AFP structured fields honored by XPAF (Continued)

Structured field	Description	Limitations
CFI	Coded Font Index	
CPC	Code Page Control	
CPD	Code Page Descriptor	
CPI	Code Page Index	
DXD	Data Map Transmission Subcase Descriptor	This structured field is ignored by XPAF because the only information it contains is constant.
EAG	End Active Environment Group	
ECF	End Coded Font	
ECP	End Code Page	
EDG	End Document Environment Group	
EDM	End Data Map	
EDT	End Document	
EDX	End Data Transmission Subcase	
EFM	End Form Map	
EFN	End Font	
EIM	End Image Object (IOCA and IM images)	
EMM	End Medium Map	
EMO	End Medium Overlay	
EOG	End Object Environment Group	
EPG	End Page	
EPM	End Page Map	
EPS	End Page Segment	
EPT	End Presentation Text Block	
ER	End Resource	This structured field is processed only for inline FORMDEFs and PAGEDEFs. No other inline resources are supported.
ERG	End Resource Group	
FDS	Fixed Data Size	

Table 35-3. AFP structured fields honored by XPAF (Continued)

Structured field	Description	Limitations
FDX	Fixed Data Text	
FGD	Form Environment Group Descriptor	This structured field is ignored by XPAF because the only information it contains is constant.
FNC	Font Control	
FND	Font Descriptor	
FNI	Font Index	
FNO	Font Orientation	
ICP	Image Cell Position	
IDD	Image Data Descriptor	
IDM	Invoke Data Map	
IID	Image Input Descriptor	
IMM	Invoke Medium Map	
IOC	Image Output Control	Because of image consolidation which is performed by XPAF during processing, single- and double-dot images cannot be mixed in the same resource. In addition, XPAF supports only the (0, 90) orientation for complex images.
IPD	Image Picture Data	
IPO	Include Page Overlay	
IPS	Include Page Segment	
IRD	Image Raster Data	
LNC	Line Descriptor Count	
LND	Line Descriptor	
MCC	Medium Copy Count	
MCF	Map Coded Font - Format 1 and Format 2	
MDD	Medium Descriptor	XPAF processes the triplets to identify the medium origin and print direction, but does not use the medium size.
MIO	Map Image Object	

Table 35-3. AFP structured fields honored by XPAF (Continued)

Structured field	Description	Limitations
MMC	Medium Modification Control	
MMO	Map Medium Overlay	
MPO	Map Page Overlay	XPAF ignores this structured field because XPAF does not precondition the printer with resources that may be used. XPAF will download the overlay when the IPO structured field is encountered in the data stream.
MPS	Map Page Segment	XPAF ignores this structured field because XPAF does not precondition the printer with resources that may be used. XPAF will download the page segment when the IPS structured field is encountered in the data stream.
MSU	Map Suppression	
NOP	No Operation	XPAF ignores this structured field unless position 24 in the first record of the data contains the character 'X'. XPAF assumes this character indicates that the logical device specified when the document was created by DCF was a Xerox printer. All resolutions are assumed to be in 300ths of an inch and all resources are assumed to be Xerox resources.
OBD	Object Area Descriptor	XPAF assumes that the triplets in the descriptor are in sequence according to triplet identifier. The ID is not checked against the OBP ID to ensure consistency.
OBP	Object Area Position	XPAF supports only the (0, 90) orientation.
PGD	Page Descriptor	
PGP	Page Position - Format 1 and Format 2	
PMC	Page Modification Control	XPAF ignores this structured field.
PTD	Presentation Text Descriptor - Format 1 and Format 2	XPAF ignores this structured field.
PTX	Presentation Text Data	

## Using advanced features

---

Through XPAF, you can perform many types of complex processing, such as:

- Print AFP color documents to both highlight and full color printers.
- Use the Document Finishing Architecture (DFA) interface if your printer is equipped with finishing equipment.
- Change the plexing mode within or between documents.
- Consolidate images and overlays to improve printer performance.
- Adjust the quality of your printed images.
- Select varying paper sizes.

### Highlight color

---

XPAF supports AFP color requests. The highlight color printers use ink color cross-reference tables to match the requirements for color specified within composed text pages or PAGEDEFS to a color supported by the printer. Refer to [Section Three: Managing Resources with XPAF](#) for information about creating and maintaining these tables.

### Adding color to DCF SCRIPT/VS documents

---

If you plan to print DCF SCRIPT/VS documents on a highlight color printer, follow these steps.

#### Update the PDT and LDT

---

- Step 1.** Update the physical device table macro, DSMPDT. Add the COLOR keyword to this macro to enable the use of color for the Define Font (.df) and Define Rule (.dr) control words.
- Step 2.** Add COLOR=YES to the DSMPDT statement in the IBM-supplied physical device table module, DSMLPPDT. This module is contained in the DCFASM dataset.
- Step 3.** Assemble and relink the DSMLPPDT module. For sample information on linking the module, refer to the DCSAMP member in the DMSTSDCT library.
- Step 4.** Update the logical device table module, DSMPLDT, so that it references the correct physical device table.

For more information on these steps, refer to the IBM publication *SCRIPT/VS Text Programmer's Guide*.

## Use SCRIPT control words

---

When printing documents created in DCF SCRIPT/VS, you may use the Define Font (.df) or Define Rule (.dr) control words to implement colorized text, lines, and rules.

- The Define Font control word allows you to colorize a font, which can then be used on various other Script control words, such as Define Area, Define Head Level, etc. The syntax for this command is as follows:

```
.df font-name TYPE(type-face point-size) COLOR color
```

where

<i>font-name</i>	The name of the font.
<i>type-face</i>	The typeface name for this font.
<i>point-size</i>	The point size of the font.
<i>color</i>	A valid color.

- The Define Rule control word has a similar parameter to colorize lines. The rule definition may be used to add color to Horizontal Rules, Vertical Rules, Boxes, Underscore Definitions, and Tables. The syntax for this command is as follows:

```
.dr rule-name WEIGHT weight COLOR color
```

where

<i>rule-name</i>	The name of the rule.
<i>weight</i>	The weight or thickness of the rule.
<i>color</i>	A valid color.

For more information on these commands, refer to the IBM publication *Document Composition Facility: SCRIPT/VS Language Reference*.

## Using PAGEDEF commands to specify color

---

When creating a PAGEDEF, you may specify color options on either the PRINTLINE or FIELD command. The color specification allows entire print lines or segments of a print line to be colorized. The syntax for these commands are:

```
PRINTLINE FONT font-name POSITION x y COLOR color
```

OR

```
FIELD TEXT 'text' COLOR color
```

where

<i>font-name</i>	The name of the font.
<i>x</i>	The horizontal position of the text.
<i>y</i>	The vertical position of the text.
<i>color</i>	The color in which the text should be printed: RED, BLUE, GREEN, BLACK, or other color.
<i>'text'</i>	The text you wish to be printed in color.

For more information on specifying color in the PAGEDEF, refer to the IBM publication *Page Printer Formatting Aid Reference Manual*.

## *Adding color to text within overlays*

---

You may add color to text in an overlay even if the application used to create the overlay does not support color. Two ways of doing this are:

- You can add color to an existing overlay by adding or setting the Set Text Color (STC) flags in the PTX structured field. For more information, refer to the *Advanced Function Printing: Data Stream Reference*.
- Using products such as Elixir, Lytrod, and Intran, you can create color overlays or add color to existing overlays. For more information on these products, contact your local Xerox representative.

## *Using color images*

---

You can include IM-type images colored via the IID structured field in your documents and print them in color on centralized highlight color printers. XPAF converts an image to monochrome .IMG, monochrome RES .IMG, and/or two-color RES .IMG format based on these factors:

- The value specified for the PRINTENV initialization parameter
- The target printer (whether monochrome or highlight color)
- The color of the image, whether black only, color only (image does not contain black), or both black and color
- Whether the image will be stored in the native centralized image library

These print factors only affect the resource when the image is first converted or if it is revised. If the resource has been previously converted, no change is made.

The relationship of how the print factors work together is shown in table 35-4. If you specify PRINTENV=MONO, XPAF only creates and prints a monochrome black .IMG file, regardless of the other print factors.

Table 35-4. Print factors for colorized images

	Target printer is ...			
	Mono	Highlight	Mono	Highlight
AFP resource is ...	PRINTENV=COLR		PRINTENV=BOTH	
Black only Not stored in native library	A <sup>1</sup>	A	A	A
Black only Stored in native library	A <sup>1</sup>	A	A	A
Color only (no black) Not stored in native library	A <sup>1</sup>	B	A	B
Color only (no black) Stored in native library	C <sup>1</sup>	B	C	D
Both black and color Not stored in native library	A <sup>1</sup>	E	A	E
Both black and color Stored in native library	F <sup>1</sup>	E	F	G

<sup>1</sup> XPAF forces the PRINTENV=COLR parameter to PRINTENV=BOTH, and creates the specified image type.

where

- A XPAF only creates and prints a monochrome black .IMG file.
- B XPAF only creates and prints a monochrome RES .IMG file.
- C XPAF creates both a monochrome black .IMG file and a monochrome RES .IMG file, but only prints the monochrome black .IMG file.
- D XPAF creates both a monochrome black .IMG file and a monochrome RES .IMG file, but only prints the monochrome RES .IMG file.
- E XPAF only creates and prints a two-color RES .IMG file.
- F XPAF creates both a monochrome black .IMG file and a two-color RES .IMG file, but only prints the monochrome black .IMG file.
- G XPAF creates both a monochrome black .IMG file and a two-color RES .IMG file, but only prints the two-color RES .IMG file.

## Using XPAF color cross-reference tables

Color cross-reference tables map colors for text in IBM AFP documents to printable colors defined in ink catalogs on highlight color printers. In XPAF, use the Maintain Color Cross-Reference Tables option on the Manage Tables menu to create the necessary color cross-reference tables.

Once the tables are created and stored, you must add the INKXLIB and INKXREF parameters to one of these files:

- The XINSXOSF member of XINPARM
- The printer profile of each highlight color printer


Otherwise, XPAF will not be able to locate and use the table entries. Also, you must ensure that COLOR has been specified for the FEATURE parameter in the printer profile of each highlight color printer (this is the default).

If the colors defined within the color cross-reference table use custom ink catalog and/or palette names, then code an Ink Descriptor within the PDL indicating which catalog and palette should be used.

## Using extended JCL keywords

You can use these extended JCL keywords to specify color in AFP documents sent to centralized highlight color printers:

Table 35-5. Color-related keywords for AFP documents

Extended JCL keyword	Function
COLORIMG	<p>Identifies the color to be applied to images:</p> <ul style="list-style-type: none"> <li>• If the images are monochrome, this color overrides the existing color, including black.</li> <li>• If the images are two-color, this color overrides the highlight color.</li> </ul> <p>To colorize all .IMG files, use this format:</p> <pre>//REPORT OUTPUT COLORIMG=RED</pre> <p> <b>NOTE:</b> This keyword does not apply to images embedded within a .FRM.</p>
INKXLIB	Identifies the name of the library where the color cross-reference tables are stored.
INKXREF	Identifies the name of the color cross-reference table, and optionally, alters the color cross-references within the table for text in the current document only.
IRESULT	Identifies the ink to be used when different inks overlay on a pixel.
XMP	Specifies whether to use Xerographic mode switching (XMS) to print the entire document using highlight color print mode.

## Full color

---

You can specify color in AFP documents sent to the 4700 printer and PCL-capable color printers. However, the 4700 printer does not use color cross-reference tables to match colors. Instead, colors that are coded in AFP documents are passed through directly to the 4700 printer. Note that AFP supports only eight colors (an IBM limitation).

## Document finishing

---

You can use XPAF features to control some aspects of document finishing, including:

- Setting the finishing boundary
- Stapling

### Setting the finishing boundary

---

For centralized printers only, you can specify a finishing boundary for a document if your printer supports the Document Finishing Architecture (DFA) interface (version 4.1 or higher). The output is finished at the copy group's boundary.

To specify a finishing boundary, complete these steps:

- Step 1.** Ensure that the destination printer's profile specifies FEATURE=DFA.
- Step 2.** In the appropriate IBM form definition source code, include one or more of these values in the MEDIA\_INFO keyword of the FORMDEF PROCESSING command:

Table 35-6. MEDIA\_INFO keyword values

Value	Result
1	XPAF sends the SPLIT=NOW DJDE to the printer to split the output between copy groups for document finishing purposes.
2	XPAF sends the SF1=YES DJDE to the printer to raise (that is, turn on) signal function 1 for document finishing purposes.
3	XPAF sends the SF1=NO DJDE to the printer to lower (that is, turn off) signal function 1 for document finishing purposes.
4	XPAF sends the SF2=YES DJDE to the printer to raise (that is, turn on) signal function 2 for document finishing purposes.

Table 35-6. MEDIA\_INFO keyword values (Continued)

Value	Result
5	XPAF sends the SF2=NO DJDE to the printer to lower (that is, turn off) signal function 2 for document finishing purposes.
6	XPAF sends the SEPARATORS=FIRST DJDE to the printer to indicate that a separator should be printed for every segment of the corresponding copy group for document finishing purposes.



**NOTE:** XPAF does not determine the function of signal function 1 and signal function 2; the signal's function is defined by the third-party finishing equipment. Refer to the finishing equipment documentation supplied by your third-party vendor for more information about the equipment's use of signal functions.

For more information about specifying values for the MEDIA\_INFO keyword, refer to the IBM publication *Page Printer Formatting Aid User's Guide and Reference*. Refer to the PDL/DJDE Reference Manual for your centralized printer for more information about DJDEs.

- Step 3.** Compile the form definition source code to create a FORMDEF that contains your copy group.
- Step 4.** In your data stream, specify an Invoke Medium Map (IMM) structured field, using the name of the copy group that you created in step 2. Refer to the IBM publication *Advanced Function Printing: Data Stream Reference* for more information.

## Stapling

For centralized and PCL-capable printers that support stapling, you can staple documents by specifying the STAPLE extended JCL keyword. Follow this procedure:

- Step 1.** Ensure that the destination printer's profile specifies FEATURE=STITCHER.
- Step 2.** Specify the JDE extended JCL keyword. This keyword must name a JDE that is coded for stapling.

XPAF provides a sample JDE called PGSTAP in XPFSAMP member DFAULT. You can use your own JDE if you wish. The JDE must contain statements similar to:

```
VOLUME CODE=NONE;
OUTPUT STAPLE=YES,NT01=YES,FACEUP=YES;
```

It must be loaded into your PDL library on the host, downloaded to the printer, and compiled.

- Step 3.** Specify the STAPLE extended JCL keyword in the JCL to submit the job.

## Duplex mode printing

---

For AFP documents, the duplex mode is set by the FORMDEF. However, you can use extended JCL keywords to override the FORMDEF specification:

- For documents originally formatted for an IBM 3800-type printer, specify the XDUPLEX extended JCL keyword. This keyword applies for documents that have only simplex copy groups within a FORMDEF.

For example, if you specify XDUPLEX=YES, simplex documents originally formatted for an IBM 3800-type printer will be printed on both sides of the paper.

- For all other AFP documents sent to centralized printers, specify the DUPLEXSW extended JCL keyword. This keyword determines whether the plexing mode on the printer switches between simplex and duplex.

For example, if you specify DUPLEXSW=Y and the print job has copy groups that specify both simplex and duplex in the FORMDEF, the printer will clear the paper path each time the plexing mode changes between simplex and duplex.

If you specify DUPLEXSW=N and the print job has copy groups that specify both simplex and duplex in the FORMDEF, the printer does not switch plexing modes between simplex and duplex. In other words, the entire job will print in duplex mode. For any copy group that specifies simplex, a blank page is sent for the back of the page.

## Image enhancement

---

AFP images may occasionally appear faint when converted to Xerox format and printed on Xerox printers. You can control the appearance of AFP images that are printed on Xerox printers at two levels:

- At the job level by using the XSHADE extended JCL keyword. This keyword specifies whether to enhance cells within AFP images that are recognized as a shading pattern.
- At the printer level by using the IMAGETYPIMP, IMAGEINIMP, and IMAGEOUTIMP printer profile parameters. Table 35-7 describes the effect produced by each combination of these parameters.

Table 35-7. Effect of image-enhancement parameter values on image appearance

IMAGETYPIMP value	IMAGEINIMP value	IMAGEOUTIMP value	Enhancement result	
			Simple images <sup>1</sup>	Complex images <sup>2</sup>
NONE	any value	any value	None	None
SIMPLE	blank	blank	None	
SIMPLE	XRFTABTI	blank	Enhance during input (slight improvement)	
SIMPLE	blank	XRFTABTO	Enhance during output (better improvement)	None
SIMPLE	XRFTABTI	XRFTABTO	Enhance during both input and output (best improvement)	None
COMPLEX	blank	blank	None	Enhance during output (better improvement)
COMPLEX	XRFTABTI	blank	None	Enhance during output (better improvement)
COMPLEX	blank	XRFTABTO	Enhance during output (better improvement)	None
COMPLEX	XRFTABTI	XRFTABTO	Enhance during output (better improvement)	Enhance during input (slight improvement)
ALL	blank	blank	None	Enhance during output (better improvement)
ALL	XRFTABTI	blank	Enhance during input (slight improvement)	Enhance during both input and output (best improvement)
ALL	blank	XRFTABTO	Enhance during output (better improvement)	None
ALL	XRFTABTI	XRFTABTO	Enhance during both input and output (best improvement)	Enhance during input (slight improvement)

<sup>1</sup> A simple image is composed of one or more contiguous IRD structured fields that contain the entire raster pattern for the image.

<sup>2</sup> A complex image divides the image data into one or more image cells which are individually positioned relative to the image origin by using ICP structured fields.

## Image consolidation

---

If you are printing a document on a centralized printer, XPAF performs image consolidation to enhance performance. Image consolidation processing is not performed for documents that are printed on decentralized or PCL-capable printers.

XPAF consolidates images as follows:

- Inline images on a page that are not referenced by another resource (overlay or page segment) are consolidated and converted into a single .IMG, then downloaded to the printer. The .IMG is automatically deleted after the document is printed; each time inline images are referenced, they are reconverted.

Review the IMAGEEXP printer profile parameter value to ensure it accommodates the maximum number of images contained on any page in any document sent to this printer. If the number of images on a page exceeds the limit you have established for this parameter, XPAF issues a message.

- Images referenced within an overlay, excluding those that are included in a page segment referenced by the overlay, are consolidated and converted into a single .IMG, then downloaded to the printer. The converted image is stored in the native image library and referenced the next time it is printed in another document. The images are not converted again unless the overlay is revised using the REVOVLY extended JCL keyword.

Review the IMAGEAXO printer profile parameter value to ensure it accommodates the maximum number of images contained in any overlay, excluding images in page segments that are referenced by the overlay, in a document sent to this printer. If the number of images in an overlay exceeds the limit you have established for this parameter, XPAF issues a message.

- Images referenced within a page segment are consolidated and converted into a single .IMG, then downloaded to the printer. The converted image is stored in the image library and referenced the next time it is printed in another document. The images are not converted again unless the page segment is revised using the REVPSEG extended JCL keyword.

Review the setting of the IMAGEMAXS printer profile parameter to ensure it accommodates the number of images contained in any page segment in any document for this printer. If the number of images in a page segment exceeds the limit you have established for this parameter, XPAF issues a message.

Image consolidation applies only to images within a single resource type; different resources on a page are not consolidated. For example, individual page segments referenced within overlays are not consolidated into a single page segment.



**CAUTION:** If you include both single- and double-dot images on a single page or within a single page segment or overlay, XPAF consolidates the images; however, the printed results are unpredictable.

---

## *Overlay consolidation*

---

If your documents include multiple overlays in a copy group, you can consolidate those overlays to improve printer performance. Overlay consolidation can be specified at the job level by using the MERGEOVL extended JCL keyword.

## *Paper size/paper tray processing*

---

If you have a document that uses more than one paper size, you may specify different paper trays in the MMC structured field of a copy subgroup within a medium map. This support is provided for AFP documents when printing to centralized, decentralized, and PCL-capable printers.

To activate this feature, you must specify a valid varying paper size table using the VARPAPTB initialization parameter, printer profile parameter, or extended JCL keyword. Refer to [Section Three: Managing Resources with XPAF](#) for instructions on creating and updating the varying paper size table.

## Verifying your print environment

---

This section identifies any additional steps you should take before you begin submitting jobs.

### Region size

---

To process AFP data streams with XPAF, make sure the region size defined in the XOSF start-up proc (XOSF00) is set to at least 6144K.

### For 4235 printers in XPPM mode

---

If you are printing a Metacode data stream on a 4235 printer in XPPM mode, verify that the PCL printer profile parameter is set to META before submitting the job.

### For printing AFP documents through HPIP

---

Before you print AFP documents through HPIP, specify IMAGEPROC=2 in the printer's profile. This allows XPAF to perform an alternate AFP image conversion using an enhanced algorithm that reduces CPU time.



**NOTE:** When the alternate conversion is specified (IMAGEPROC=2), these restrictions apply:

- Only IM images and a subset of IOCA images are supported. These IOCA images are not supported: CCITT JPEG, Color, Grayscale, Banded, Numbered, and ABIC.
  - For centralized printers, all images colorized via the IID structured field are treated as black, regardless of the IID image color value or printer capability.
  - For decentralized and PCL-capable printers, images colorized via the IID structured field will print as created.
  - The output quality for both simple and complex images may differ from the output produced by specifying IMAGEPROC=1.
  - Ensure that you also specify the correct paper size for the document. If the paper size is not specified correctly, output results may be unpredictable.
  - While IMAGEPROC=2 allows XPAF to process data at a faster rate than normal, it has no effect on the printer processing speed.
-

## Printing documents

---

Submit your documents for printing using standard JCL. Ensure that your job class references a supported centralized, decentralized, or PCL-capable printer.



---

**NOTE:** If you select a centralized printer, it must be running V2/V3.5 OSS or above.

---

## Converting AFP documents to Metacode or XES documents

---

AFP documents must be converted to a Xerox format for printing on Xerox printers.

- For AFP documents sent to a centralized printer, XPAF converts the AFP commands to Metacode commands.
- Similarly, for AFP documents sent to a decentralized printer, XPAF converts the AFP commands to XES commands.
- For AFP documents sent to a PCL-capable printer, XPAF converts the AFP commands to XES commands, then converts the XES commands to PCL. Refer to Chapter 33, "[Printing XES documents](#)" for information about the XES-to-PCL conversion.

## Printable area restriction

---

Due to rounding and processing differences, you should avoid printing any text, rules, and images within 1/8 inch of the valid printable area.

## Processing limitations

---

When printing AFP documents through XPAF, restrictions apply to certain elements, including:

- Text orientation
- IOCA images
- Paper trays

### *Text orientation limitation*

---

For AFP documents, XPAF does not support text orientations with these inline/baseline combinations:

Table 35-8. Unsupported text orientations

Inline/Baseline combinations	
Inline 0	Baseline 270
Inline 90	Baseline 0
Inline 180	Baseline 90
Inline 270	Baseline 180

These combinations will cause the text to be positioned incorrectly on the page.

### *IOCA support limitations*

---

XPAF cannot process IOCA images that contain Band Image Data or Numbered Image Data. Band Image Data is an optional IOCA element used to specify images that are presented in a series of separate bands. Numbered Image Data is an optional IOCA element used to specify images presented in a group of adjacent tiles.

Be sure to remove all banded or tiled images from your data streams before processing them through XPAF. If the images are essential to the print job, regenerate them in a form other than banded or tiled and reinsert them into your data stream.

## *Paper tray processing limitations*

---

When specifying varying paper sizes within a document, note these restrictions and limitations:

- Due to restrictions with some printers, the printer may not be able to combine certain paper sizes within a document. XPAF does not perform any cross-checking of which paper sizes have been specified, but instead leaves the printer to resolve any possible conflicts.
- The number of combinations of different paper sizes is unlimited. However, in practice, the number of different paper sizes you can specify is limited by the physical number of printer paper trays.
- XPAF cannot query the printer to determine the number of paper trays available, nor the actual sizes of paper physically loaded in those trays.
- XPAF has no method of controlling which output destination the paper will be delivered to on the printer.
- Because overlays are a fixed size, XPAF cannot adjust them to fit the specified paper size nor reposition them on the page. They may, however, appear to be placed differently based on the specified page origin and paper size.
- If you have a duplex form definition, you must specify the same bin number within the copy subgroup for each side of the sheet being printed. Otherwise, the value specified for the front side of the page will override the value specified for the back side of the page. XPAF does not issue an error message.



---

**NOTE:** Because of the extra processing that must be done every time the bin number changes within a copy subgroup, processing times may be adversely affected if you specify a mixture of bin numbers within the same copy group or job.

---

## *AFP-to-Metacode conversion limitations*

---

When printing AFP documents to centralized printers, restrictions apply to certain elements, including:

- Inline coordinates for fonts
- Color IID structured field processing
- Including images in overlays
- Converting overlays
- Printer image-per-page considerations

## *Inline coordinates for fonts*

---

When printing to a centralized printer, XPAF adjusts the inline coordinate for the output text by the left kern value of the font being used. The left kern value is based on the font typeface and the point size of the font. For some fonts, this value may be as large as 35 pels.

For example, the replica font XABH0 has a left kern value of 2. If your document requires that the character 'A' be positioned at inline position 300, the actual inline position sent to the printer would be 298 (the difference between 300 and the left kern value of 2).

When processing AFP documents that contain text positioned less than 1/8 inch from the edge of the page, the inline coordinate required to replicate the position may be negative, which is an invalid value. Any character that is detected as printing outside of the valid printable area is ignored.

If you specify DATAACK=UNBLOCK in your JCL, an error indicator shows the area of the data check, and XPAF issues an error message. Therefore, you should avoid printing within 1/8 inch of the left margin.

## *Color IID structured field processing*

---

When printing AFP documents that contain images colorized via the IID structured field, these limitations apply:

- XPAF support is limited to IM-type images.
- XPAF support does not include these features:
  - Reverse video processing
  - Image print impression processing
- If a colorized image is required for a merged overlay but is not available, the equivalent monochrome black image will be substituted, if available. If the monochrome black image is not available, a message is issued stating that the resource could not be found and processing is terminated.
- XPAF does not convert an image every time it is printed. If XPAF does not revise the image, the existing image will be printed instead of the updated image. Therefore, if you change the color in the IID structured field for an image, you must also specify either the REVOVLY or REVPSEG extended JCL keyword to reconvert the image.
- If you choose to store color images in the centralized image library and you specify PRINTENV=BOTH, XPAF maintains two separate copies of the image: one black and the other color. When the image is printed, XPAF downloads the appropriate file to the specified printer, using the last six characters of the file name as the resource name stored on the printer. Because the last six characters are the same for both files, they will both have the same name when downloaded to a printer. However, the two files will never be downloaded to or stored on the same printer, so no naming conflict will exist.

- All individual colors of a RES .IMG format image, other than black, will be represented in a consolidated image as a single color. This color will match the first colorized IID image color attribute value encountered within the AFP resource or data stream.
- If there are multiple RES .IMG images which contain different highlight colors within the same job, the printer will not be able to reconcile the conflict. As a result, either an error may occur at the printer or some of the color images may print as black.

### *Including images in overlays*

---

For any overlay, XPAF rounds up the image dimensions to the next byte boundary. Any PSF image within 7 pels of the edge of the valid printable area may not be printable by XPAF.

### *Converting overlays*

---

When XPAF converts overlays, they are converted as if they are medium overlays. No offset is applied to the positioning of text, rules, or images. The converted overlay is stored as a .FRM. When invoked as a page overlay, the IPO offsets are applied to the text and image coordinates held in the record prefix of the XPAF internal formatted resource. These records are then merged with the variable page data.

If a negative inline coordinate is generated (due to left kern adjustment) when the overlay is converted, the character is not saved as part of the converted resource, even if it would have printed once the IPO offsets were applied.

### *Printer image-per-page considerations*

---

For documents printed on centralized printers for which image consolidation is performed:

- The page counts as one image if it contains any inline images.
- Each overlay on the page counts as one image if it contains any inline images; individual images within an overlay do not affect the image-per-page count because they are consolidated when the overlay is converted to a .FRM.
- Each page segment on the page or referenced by an overlay counts as one image; individual images within a page segment do not affect the image-per-page count because they are consolidated when the page segment is converted.

## *AFP-to-XES conversion limitations*

---

When printing AFP documents to decentralized or PCL-capable printers, restrictions apply to certain elements, including:

- Including images in overlays
- Converting overlays
- Printer image-per-page considerations

### *Including images in overlays*

---

For any overlay, XPAF rounds up the image dimensions to the next byte boundary. Any PSF image within 7 pels of the edge of the valid printable area may not be printable by XPAF.

### *Converting overlays*

---

When XPAF converts overlays, they are converted as if they are medium overlays. No offset is applied to the positioning of text, rules, or images. The converted overlay is stored in XPAF internal format. When invoked as a page overlay, the IPO offsets are applied to the text and image coordinates held in the record prefix of the XPAF internal formatted resource. These records are then merged with the variable page data.

If a negative inline coordinate is generated (due to left kern adjustment) when the overlay is converted, the character is not saved as part of the converted resource, even if it would have printed once the IPO offsets were applied.

### *Printer image-per-page considerations*

---

For documents printed on decentralized or PCL-capable printers, for which image consolidation is not performed:

- Each image on the page counts as one image.
- Each image in an overlay counts as one image.
- Each image in a page segment counts as one image.

If the total image count supported by the destination printer is exceeded on any page in a document, XPAF processes the document; however, the document will fail at the printer.

Some decentralized and PCL-capable printers have a limit on the number of images per page that can be printed. This limitation is usually based on the amount of memory in the printer. For example, if you have one complex image on a page that requires more memory than is available on the printer, only part of the image will print. However, if you have 20 simple images on a page that do not require a lot of memory, all of the images will print.

If you specify IMGTYPE=0 in the initialization parameters, printer's profile, or JCL, the size of the converted image will print smaller in XPAF (by a factor of 20%) than the original 240 dpi image printed in AFP.

## Troubleshooting problems

Occasionally, your output may not print as you expected. If this happens, review the items in table 35-9 for information to help you resolve the problem.

Table 35-9. Common printing errors for AFP documents

Symptom	Explanation	Steps to take
Job attempts to print outside the valid printable area.	XPAF processing may produce slight rounding and processing differences.	Avoid printing any text, rules, and images within 1/8 inch of the edge of the valid printable area.
AFP images appear faint when printed on Xerox printers.	Printing on Xerox printers may result in slight differences.	Use the XSHADE extended JCL keyword or the IMAGETYPIMP, IMAGEINIMP, and IMAGEOUTIMP printer profile parameters to adjust for differences at the printer.
AFP line-mode data prints differently on IBM and Xerox printers.	Possible causes are: <ul style="list-style-type: none"> <li>The XOSF start-up proc and PSF printer proc use different values for the default PAGEDEF, FORMDEF, and CHARS, or different AFP resource library concatenations.</li> <li>XPAF is not processing the document as AFP (when no FORMDEF, PAGEDEF, or CHARS keywords are specified in the JCL).</li> </ul>	Try these actions: <ul style="list-style-type: none"> <li>Set the XOSF start-up proc values to match those in the equivalent PSF printer proc.</li> <li>Set the XOSF start-up proc library concatenation to match the concatenation in the equivalent PSF printer proc.</li> <li>Set the DEFLINE initialization or printer profile parameter to PAGE to instruct XPAF to use the default PAGEDEF and FORMDEF when processing documents using PMODE=LINE.</li> </ul>
Pages are rotated 90 degrees from the expected result.	Possible causes are: <ul style="list-style-type: none"> <li>The FORMDEF contains a landscape presentation setting in the medium descriptor.</li> <li>The PMODE initialization parameter, printer profile parameter, or extended JCL keyword is set to LAND.</li> </ul>	The IBMPPMODE initialization and printer profile parameters instruct XPAF to honor (Y) or ignore (N) the page presentation as coded in AFP.  If you specified IBMPPMODE=N, change the value of PMODE from PORT to LAND, or vice versa if necessary, to rotate the page.

Table 35-9. Common printing errors for AFP documents (Continued)

Symptom	Explanation	Steps to take
Converted overlay text, rules, and/or images appear in the wrong position on a page.	Possible causes are: <ul style="list-style-type: none"> <li>The overlay was converted for one paper size but was printed on a different paper size. For example, the overlay was created for 8.5 by 11 inch paper but was printed on 8.5 by 14 inch paper.</li> <li>The overlay was converted for one orientation (for example, PMODE=PORT), but was used in a document with a different orientation (PMODE=LAND).</li> </ul>	You can use converted overlays only in the presentation and for the paper size in effect when the overlay was converted.  To use an overlay in a different presentation or paper size, either specify REVOVLY in your extended JCL, or reference the user library where the original overlay is stored via the USERLIB IBM JCL keyword.
Font and character set mapping is different on Xerox printers than on IBM printers.	Possible causes are: <ul style="list-style-type: none"> <li>RJOB105 (create font tables) was not run for all IBM font libraries, or was not run the opposite order of the IBMFONT concatenation.</li> <li>The XOAF Update IBM Font Characteristics Information option was not run for all IBM font libraries or was not run in the opposite order of the IBMFONT concatenation.</li> <li>A required IBM font library was contained in a USERLIB statement. XPAF does not support USERLIB processing for font libraries.</li> </ul>	Try these actions: <ul style="list-style-type: none"> <li>Run RJOB105 on all IBM font libraries in the reverse order of the IBMFONT concatenation.</li> <li>Run the XOAF option to create IBM font characteristics in the reverse order of the IBMFONT concatenation.</li> <li>Add the required IBM font library to the beginning of the IBMFONT DD statement in your XPAF printer proc. Then run RJOB105 against the IBM font library.</li> </ul>
Two-color RES images do not print correctly.	A problem may exist within the image as it was originally created.	Run the XRCBATCH diagnostic utility to separate the image into two different formats to determine which part of the image is causing the problem. Refer to chapter 38, <a href="#">“Using XRCBATCH”</a> for instructions on running XRCBATCH.
The image boundary cannot be determined for a colorized image.	Possible causes are: <ul style="list-style-type: none"> <li>The image boundary may be larger than the area in which it is printed.</li> <li>The image boundary may overlap another image.</li> </ul>	Run the XRCBATCH diagnostic utility to convert the image to a single black image, then reverse the color. Refer to Chapter 38, <a href="#">“Using XRCBATCH”</a> for instructions on running XRCBATCH.

Table 35-9. Common printing errors for AFP documents (Continued)

Symptom	Explanation	Steps to take
When printing on centralized printers, an undefined tray error occurs.	The FORMDEF contains one or more requests for numbered trays (2–9). XPAF translates these requests into FEED=TRAY $n$ commands, where $n$ is the requested tray number.	Try these actions: <ul style="list-style-type: none"> <li>Ensure TRAY1 through TRAY9 are defined on the centralized printers used to print AFP documents. You may map these values to the available trays on each printer.</li> <li>Define a varying paper sizes table to map the bin numbers in the FORMDEF to the trays on the printer.</li> </ul>
When printing on decentralized printers, document data is misaligned, and the printer issues DATA OFF PAGE errors.	The paper size specified in the data stream does not match the size of the paper in the printer tray.	Make sure that the printer contains the correct paper size in the tray(s) selected by XPAF when printing AFP documents.
When printing AFP data streams that contain inline images which use DCF shading, printer performance does not match expectations.	If the DCF shading was built without repeat and fill, XPAF must scale inline images that contain DCF shading each time they are referenced.	To improve performance, rebuild the DCF shading in the images to use repeat and fill. This will allow XPAF to perform a direct 300 dpi substitution instead of having to scale the image. For more information on designing your AFP applications for better performance, refer to the IBM PSF documentation.
When printing to a 4700 printer, data is missing.	The 4700 printer has a non-printable area on the page called a deletion area. If data is positioned in this area, it is not printed. This condition does not produce error messages by XPAF or the printer.	Refer to the printer's manual for the size of the deletion area, then rework the document so that data is not positioned in the 4700 printer's non-printable area.
A print job using a large number of fonts fails at the printer when directed to a centralized printer.	The printer was not set up to handle the number of fonts specified in the document.	If your document contains a large number of fonts, verify that the printer FONTS command is set to at least 64. For example, at the printer console, you could enter: <p style="text-align: center;">FONTS 64</p> The maximum number of fonts allowed is 128.

Table 35-9. Common printing errors for AFP documents (Continued)

Symptom	Explanation	Steps to take
When printing mixed mode documents (containing both simplex and duplex) to a 4230 or 4220 printer, duplex pages are rotated 180 degrees.	The 4230 and 4220 printers have a printer setup option, Invert Duplex Print Direction, that allows you to change the print orientation for duplex pages. When allowed to default (Disabled), duplex pages are printed in the opposite direction of the simplex pages.	On the printer, change the Invert Duplex Print Direction option to Enabled via the Printer Setup menu, then resubmit the document.
When printing to a 4030 printer, the document does not format correctly.	The 4030 printer has two printer configuration options that must be set to OFF: AUTO-CR and AUTO-LF. Failure to turn these options OFF may result in incorrect document formatting when printing AFP data streams.	Refer to the printer's manual for instructions on turning off the AUTO-CR and AUTO-LF configuration options.
When printing to a 3700 printer, forms are not downloaded correctly.	You may be running the wrong level of software on the printer (2.5-11 through 2.5-18).	Upgrade the printer software to release 2.5-21.



## 36. *Printing VIPP documents*

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This chapter contains the information you need to print Variable Data Intelligent PostScript Printware (VIPP) documents through XPAF. It addresses these topics:

- Verifying that your resources have been set up correctly
- Including resources in your documents
- Modifying the processing of your documents
- Identifying a VIPP job to XPAF
- Changing a line-mode document to VIPP



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**NOTE:** VIPP applications are sent to VIPP-enabled printers. The process described in this chapter may be modified to send any document to a printer capable of handling front end processing (FEP).

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### *Data stream definition*

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VIPP documents are sent to VIPP-enabled printers in line-mode. XPAF inserts VIPP control commands at the beginning of the data stream, then sends the combined data stream to the VIPP-enabled printer. The data is formatted at the printer according to the VIPP commands contained in the document.

### *XPAF support*

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You can print VIPP documents through XPAF to any VIPP-enabled printer.

### *Preparing resources*

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VIPP document resources are managed through the VIPP software, which must reside on the printer.

Line-mode data sent by XPAF will include machine carriage control; for this reason all VIPP commands must start in column 2. In order for the VIPP-enabled printer to correctly handle this format, you must specify "/IBM1403 SETPCC" in each JDT. Sample JDTs XPAFLAND and XPAFPORT are provided as an example in XPFSAMP.

## Using resources

When processing VIPP documents, the resources you specify in your JDT must reside on the printer. XPAF sends the VIPP document to printer-resident software, which defines or retrieves the resources used in the VIPP application.

## Modifying document processing

There are several XPAF-supplied parameters and keywords used to print VIPP documents. This section identifies some of the keywords available in XPAF to change document processing. Refer to [Section Five: XPAF Parameter and Keyword Reference](#) for information about the keywords identified in this section and for other XPAF keywords available for document processing.

Table 36-1. Keywords for VIPP processing

Keyword	Function
PRMODE=VIPP	Must be specified to indicate VIPP processing.
XVIPPMEM	Specifies a VIPP member to be retrieved from the dataset defined by LPRDSN and inserted at the front of the application.
XUSERAC1-3	Specifies user-defined variable information used by the members described in this table for variable substitution at the time of document creation.
FORMS	Specifies forms used in VIPP processing. To use this keyword, XVIPPMEM= must be specified in the PPT or JCL.

## Using advanced features

Printer control commands and advanced features, such as using color or selecting paper trays, are defined in the VIPP JDTs. XPAF inserts user-defined VIPP commands that use printer-resident resources.

## Printing documents

Submit your documents for printing using standard JCL. Make sure your output class specifies a supported VIPP device.

## Verifying your print environment

---

This section identifies any additional steps you should take before you begin submitting jobs.

### Preparing to print line-mode documents using VIPP

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- Step 1.** Modify the JES printer definition to add VIPP as an accepted PRMODE
- Step 2.** Create the relevant members in the LPRDSN dataset to include the desired parameters.
- Step 3.** Review the PPT for all printers that will be printing VIPP documents.
  - a. If the printer is not supported by XPAF, but is VIPP-enabled, specify `DEVICE=VIPP` (otherwise use the correct `DEVICE=` for your printer)
  - b. (Optional) To include a set of VIPP commands that will be applied to documents with no specified user-defined commands, point the `XVIPPMEM` parameter in the printer's PPT to the member containing the desired commands. Sample source `XVIPPMEM` is supplied in `XPFSAMP`.
- Step 4.** Update their JCL to add the new keywords to the relevant `OUTPUT` statement
- Step 5.** Ensure that the JDTs used have `"/IBM1403 SETPCC"` coded, then transmit the XPAF-supplied JDTs to the target printer. A REXX sample, `VIPPFTEPP` is shipped in `XPFCCLIST`. The sample supplied with XPAF uses the fixed-pitch Courier font, which must be installed on the VIPP-enabled target printer.

## Creating a VIPP command file member

XPAF copies all the lines in the PDS member specified by the XVIPPMEM parameter following the %INSERT line. This allows you to specify comments at the beginning of a member. The following example demonstrates a simple set of VIPP commands that invokes the XPAFLAND JDT:

```
* All lines prior to the %INSERT line are considered comments
* This VIPP command file:
* 1) sets the LPR CLASS statement to "duplex"
* 2) starts the VIPP job with the VIPP required header "%!"
* 3) Invokes the "XPAFLAND" JDT stored on the printer in "line-mode"
*
%INSERT
%TCPI PCLASS(duplex)
%!
(XPAFLAND.JDT) STARTLM
```



**NOTE:** The %INSERT statement is required, even if no comments are specified. The %INSERT command must begin in column 1.

## Using variable insert information

XPAF can insert document-specific information into a VIPP document using the PPT parameter or extended JCL keyword XVIPPMEM. Variable substitution occurs when using the following information in XVIPPMEM:

Variable	Description
%FORMNAME	The JES FORM name used to process the document. I.e. STD1
%STEPNAME	The job step name i.e. PRTSTEP
%ACCOUNT	The account number used to print the job i.e. D498
%JOBNAME	The JES job name i.e. HWMPRTAC
%PRINTER	The XPAF/JES printer name i.e. PRT123
%STEPDDN	The job step ddname i.e. SYSUT1
%USERAC1	User variable extended JCL field
%USERAC2	User variable extended JCL field
%USERAC3	User variable extended JCL field

Variable	Description
%DEVICE	The printer device from the XPAF PPT i.e. N32
%IPADDR	The IP address the document i.e 192.64.0.1
%IPADDZ	The default IP address from the XPAF PPT i.e 192.64.0.4
%LPRDSN	The name of the XPAF created temporary LPR dataset
%JOBNO	The JES job number
%LINES	The number of records in the dataset
%PAGES	The number of pages in the dataset
%QNAME	The name of the LPR queue the document will be sent to
%QNAMZ	The name of the default LPR queue in the XPAF PPT
%PORT	The name of the IP port number the document will be sent to
%PORZ	The name of the default IP port number in the XPAF PPT
%USER	The user name of the account that submitted the job

Advanced users of this feature can use most of the fields defined in the following XPAF macros:

- Document Information Block, member @XDIB in SAMPMAC
- Printer Profile Table, member @XXQPPT in SAMPMAC
- Output Data Block, member @XODB in SAMPMAC
- XDIB DJDE extension, member @XDJD in SAMPMAC

Review the macros supplied in the sample macro library and use a '%' followed by the field name.

For example, the JES output class is held in the XDIB in field XDIBSOCL. To use the sysout class as a variable field in a PJL or job ticket command file, specify %XDIBSOCL.

The following example, enables the JDT to be selected in the JCL by using the XUSERAC1 extended JCL keyword:

```
* All lines prior to the %INSERT line are considered comments
* This VIPP command file:
* 1) sets the LPR CLASS statement to "duplex"
* 2) starts the VIPP job with the VIPP required header "%!"
* 3) Invokes the JDT specified by the XUSERAC1 extended JCL keyword
*
%INSERT
%TCPI PCLASS(duplex)
%!
(%USERAC1.JDT) STARTLM
```

Specifying:

```
//VI PP      OUTPUT      PRMODE=VI PP, XVI PPMEM=VARJDT, XUSERAC1=XPAFPORT
.....
//SYSUT2 DD          SYSOUT=M, OUTPUT=(*.VI PP)
```

Will cause the SYSUT2 line-mode data to be formatted with the XPAFPORT JDT.

## Default FORM and JOBNAME VIPP command processing

You can create default VIPP commands that will be used for a job based on the JES job name or FORMS name. Simply create a member containing VIPP commands with the same name as the JOB or FORM. XPAF first searches for a member that matches the JOBNAME or FORM name and will use these commands if present.

The hierarchy of the member name to use is as follows:

1. JOBNAME
2. JES FORM name
3. extended JCL keyword XVIPPMEM
4. The value specified by the XVIPPMEM PPT keyword

## 37. *Using XPAF extended features*

---

This chapter provides instructions for printing documents while using these extended features of XPAF:

- Xerox Job Control Facility (XJCF) in simulation mode
- Xerox Direct Print Services (XDS)
- High Performance Image Printing (HPIP)
- Client support for Xerox Printing Services Manager (XPSM)

### *Using XJCF simulation processing*

---

This section explains how to use XJCF simulation mode to modify XPAF processing of DJDE documents.

#### *Processing overview*

---

XPAF uses a table known as the XJCFSIM table to emulate XJCF processing. The XJCFSIM table contains sets of simulation tables. Each set of simulation tables is tied to a specific JDL and can consist of one or all of these tables:

- FORMS
- CLASS
- DEST
- FLASH
- MODIFY
- FCB
- CHARS
- PDE

When processing an XJCF job, XPAF determines the JDL being used, then reads the XJCFSIM table to determine which set of simulation tables to use. Based on the JCL keywords used to submit the job, XPAF reads the appropriate simulation tables and generates DJDEs that affect document processing.

The XJCFSIM table is user-defined and must be assembled and link-edited into XPFLD. It can either be created manually or generated from your existing XJCF XIM table. Instructions for creating the XJCFSIM table are provided in [Section Two: Installing and Customizing XPAF](#).

## DJDE generation

---

During XJCF simulation processing, DJDE generation occurs in this order:

5. DJDEs are generated from extended JCL parameters coded in the job.
6. The XJCFSIM FLASH table is processed. This table is searched for an entry that has matching COPIES, FLASH, PMODE, and TWOUP values. FORMS and/or BFORM DJDEs are generated from the matching table entry unless that particular keyword has been overridden by extended JCL.  
  
If no FLASH value is specified in the JCL used to submit the job, XPAF uses the SYSFLSH initialization parameter value as a default FLASH value. During simulation processing, this SYSFLSH value is used to find a match in the XJCFSIM FLASH table.
7. The XJCFSIM MODIFY table is processed. This table is searched for an entry that has matching MODIFY, PMODE, and COPIES values. A MODIFY DJDE is generated for the matching table entry unless the MODIFY keyword has been overridden by extended JCL. If no match is found, a MODIFY DJDE is not generated.
8. The XJCFSIM FORMS table is processed. This table is searched for an entry that has a matching form name. Associated DJDEs are generated from the matching table entry unless a particular keyword has been overridden by extended JCL or the XJCFSIM FLASH table.
9. The XJCFSIM CLASS table is processed. This table is searched for an entry that has a matching output class. Associated DJDEs are generated from the matching table entry unless a particular keyword has been overridden by extended JCL, the XJCFSIM FLASH table, or the XJCFSIM FORMS table.  
  
If neither a form nor a class entry is found in its respective table, the first form in the XJCFSIM FORMS table is used as the default.
10. The XJCFSIM DEST table is processed. This table is searched for an entry that has a matching DEST name. Associated DJDEs are generated from the matching table entry unless a particular keyword has been overridden by extended JCL, XJCFSIM FLASH table, XJCFSIM FORMS table, or the XJCFSIM CLASS table.
11. The XJCFSIM FCB table is processed to determine the LPI used for best-fit PDE selection. This table is searched for a matching FCB name. If no matching entry is found, LPI=0 is assumed. No DJDEs are generated. Associated DJDEs are generated from the matching table entry unless a particular keyword has been overridden by extended JCL or the XJCFSIM FLASH table.

12. The XJCFSIM CHARS table is processed to determine the Xerox font to be used. This table is searched for an entry that has matching CHARS and PMODE values. If a matching entry is found, XPAF generates the FONTS DJDE associated with that table entry. If no matching entry is found, the original CHARS value is used, and no DJDEs are generated.

If no CHARS value is specified in the JCL used to submit the job, XPAF uses the SYSFONT initialization parameter value as a default CHARS value. During simulation processing, this SYSFONT value is used to find a match in the XJCFSIM CHARS table.

13. The XJCFSIM PDE selection table is processed to determine the PDE that best fits the document's environment. This table is searched for matching PMODE, LPI, TWOP, and CHARS values. Since this is a best-fit search, XPAF always selects a PDE from this table and generates a FORMAT DJDE unless FORMAT has been overridden by extended JCL, the XJCFSIM FORMS table, or the XJCFSIM CLASS table.

14. The data stream initial packet is processed. If the initial packet contains any DJDEs that have not already been specified, they are added to those generated by the extended JCL and XJCFSIM tables. If the initial packet contains DJDEs already generated from the extended JCL or other tables, they are ignored.



---

**NOTE:** If you do not want the SYSFLSH or SYSFONT value to be used to match an entry in an XJCFSIM table, you must either:

- Specify SYSFLSH=, or SYSFONT=, in the XINSXOSF member of XINPARM. This sets a null value for each parameter.
  - Include the FLASH or CHARS IBM JCL keyword in the JCL used to submit the XJCF simulation job.
-

## Enabling XJCF simulation processing on a job-by-job basis

Through the extended JCL keywords shown in table 37-1, you can use XJCF simulation processing for selected DJDE documents. For detailed information about these keywords, refer to [Section Five: XPAF Parameter and Keyword Reference](#).

Table 37-1. Extended JCL keywords for XJCF simulation processing

Extended JCL keyword	Function
DJDE	Specifies whether XPAF translates extended JCL keywords to DJDEs at print time or generates any XJCF simulation DJDEs. Use this keyword if you have coded your own DJDEs in a data stream and do not want XJCF or XPAF to add any DJDEs to it.
TWOUP	Specifies whether this document prints multiple logical pages on one physical page.
XJCFSIM	Allows XOSF to control XJCF simulation processing for the current print job. Use this keyword if the printer's profile specifies XJCFSIM=N.

## Printing documents through XDS

This section identifies the types of data streams that can be printed through XDS, and provides an overview of the processing performed. In addition, it describes how to submit an XDS print job and recover from an abend.

### Data streams supported

You can use XDS to print line-mode, DJDE, XES, page-formatted, AFP, and pass-through documents.

### Processing overview

XDS prints synchronously with a print application from a started task or batch initiator through the SUBSYS parameter on the DD JCL statement, instead of through the SYSOUT parameter. As the print application writes each print record, XDS moves it to the printer. Each record within the dataset is limited to a record length of 32K, which is the limit imposed by both MVS and XOSF.

XDS honors these parameters and keywords used with XOSF:

- All JCL OUTPUT statement parameters, except COPIES and OUTDISP
- All XPAF extended JCL keywords
- All XJCF-specific extended JCL keywords
- All XPAF initialization parameters
- All XPAF printer profile parameters

## Printing documents

---

Follow these steps to print documents through XDS:

**Step 1.** Verify initialization parameters.

Be sure the values below are specified for the ALOGDSN, COMSSID, COMSSTYP, SUBSYS, and XLOGDSN initialization parameters. These parameters are found in the XINSXOSF member of the XINPARM library you created for XDS.

```
ALOGDSN=dataset-name (optional)
COMSSID=subsys-name
COMSSTYP=DIRECT
SUBSYS=subsys-name
XLOGDSN=dataset-name
```

The values for COMSSID and SUBSYS must be identical and must be the same as the XOSF start-up proc name.

Be sure this initialization parameter is specified in the XINSXOAF member of the XINPARM library you created for XDS:

```
COMSSTYP=DIRECT
```

**Step 2.** Initialize XDS.

If you installed XDS with one of the automatic initialization options, no other actions are required to initialize XDS.

If you installed XDS with the manual initialization option, you must enter this MVS operator command to start XDS:

```
START XDSSTART
```

Enter the command only after JES has started. Once the command is acknowledged, these actions occur:

- MVS initializes XDS.
- XDS initializes XOSF.
- XOSF waits for FSA orders from the print application running as an XDS batch job or started task.

**Step 3.** Submit a print job.

The printer to be used for an XDS batch print job must be defined to JES. You specify which printer to use in the JCL for the job.

To submit a print job through XDS, include this statement in your JCL for the batch print job:

```
//ddname DD SUBSYS=(xds-name,printer-name,'SEP=x')
```

where

<i>ddname</i>	The user-defined DD name for this statement.
<i>xds-name</i>	The 4-character XOSF subsystem name as defined in the SUBSYS initialization parameter in the XINSXOSF member in the XINPARM library you created for XDS.
<i>printer-name</i>	The name of the printer to be used. The printer name must be defined in the printer profile library.

x                    One of these values:

                    J    Produces job header and trailer pages.

                    D    Produces dataset separator pages.

                    JD   Produces both job header and trailer pages and  
                         dataset separator pages.

                    N    Produces no separator pages.

Default:            N

Example:

                    //PRINTJOB DD SUBSYS=(XOSF,PRT1652,'SEP=J')

## Limitations

---

Note these limitations when printing documents using XDS:

- XDS does not support multiple-step jobs.
- To help prevent errors, you must manually schedule all print jobs.
- The printer must not be active in the XPAF address space when you start a batch XDS print step.



---

**NOTE:** Within a job, you can specify a SUBSYS parameter with each DD statement specifying a different printer. Each SUBSYS parameter must specify the same XOSF subsystem.

---

## Receiving error messages from XPAF

---

You can receive or suppress the low-level error message text that caused an error while XOSF was processing an XDS-supplied document. To receive or suppress the low-level error messages, use one of the options described in the following sections.

Review these considerations before determining which option to use:

- When the application program has been given control via SYNAD or EXLST code X'09', make sure that Register 14 is preserved and restored before exiting back to the caller.
- If SYNAD and EXLST are both coded on the DCB and EXLST code X'09' is enabled and pointing to the same routine as the SYNAD= routine, a loop may occur. To solve this problem, be sure that the logic in the application program does not allow recursive calls to CLOSE.

## Process messages during WRITE/CHECK BSAM processing

---

To receive control to process the message text during WRITE/CHECK BSAM processing, code the SYNAD parameter on the DCB statement in the application program. This SYNAD routine is called whenever CHECK discovers that XDS presented a non-zero return code.

The SYNAD routine finds the address of the message buffer in tagname DCBEODA. This 24-bit address points to the message buffer, which contains the length followed by the message text.

For more information on the SYNAD parameter, refer to the *MVS/DATA Administration: Macro Instruction Reference*.

Example:

```
--SYNAD ROUTINE--
SYNAD00DSOUSER SYNAD ROUTINE
*SAVE REGISTERS AS DESIRED.
XRR15, R15CLEAR REGISTER
ICMR15, 7, DCBEODAGET ADDRESS OF MSG BUFF
BZSYNAD90NO MESSAGE BUFFER, EXIT
USING MSGBUF, R15MSGBUF
*PROCESS MESSAGE TEXT HERE
*PROCESS MESSAGE TEXT HERE
*PROCESS MESSAGE TEXT HERE
SYNAD90DSOH
*RESTORE REGISTER DESIRED.
BSMO, R14RETURN TO CALLER VIA R14
--DATA CONTROL BLOCK DEFINITION--
SYSUT2DCBDSORG=PS, MACRF=W, LRECL=*), RECFM=F, C
SYNAD=SYNAD00SYNAD ROUTINE ADDRESS
--DATA CONTROL BLOCK DSECT--
DCBD DSORG=(PS)DATA CONTROL BLOCK DSECT
--MESSAGE BUFFER DSECT--
MSGBUFDSECTMESSAGE BUFFER
MSGLENDSHMESSAGE TEXT LENGTH
MSGTEXTDSC248MESSAGE TEXT
```

## Process message text during CLOSE processing

---

To receive control to process the message text during CLOSE processing, you must specify EXLST code X'09'. On the DCB statement in the application program, code the EXLST parameter. The EXLST routine is called whenever XDS discovers an XOSF document processing error during the CLOSE process, as opposed to the WRITE/CHECK process.

The EXLST routine can be the same routine that was specified for SYNAD as long as the application program returns back via Register 14 and is prepared to handle errors at CLOSE time. Failure to return back via Register 14 may cause unpredictable results.

The EXLST routine will find the address of the message buffer in tagname DCBEODA. This 24-bit address points to the message buffer that contains the length followed by the message text.

For more information on the EXLST parameter, refer to the *MVS/Data Administration: Macro Instruction Reference*.

Example:

```
--DATA CONTROL BLOCK DEFINITION--
SYSUT2DCBDSORG=PS, MACRF=W, LRECL=80, RECFM=F, C
EXLST=$EXLST, EXIT LIST ADDRESSC
SYNAD=SYNAD00SYNAD ROUTINE ADDRESS
--EXLST PARAMETERS--
$EXLSTDSOFFULLWORD ALIGNED
DCXL1' 09' , AL3(SYNAD00)EXLST FOR MSG ERROR
DCXL1' 80' , AL3(0)END OF EXLST PARAMETER
```

## Return error information to Register 14

---

Error information can be returned to the application program in Register 14 during the CLOSE process. This process does not take place if EXLST code X'09' (MSG RTN EXIT) is active. On the DCB statement in the application program, code the EXLST parameter. EXLST entry X'08' signals XDS to suppress XOSF-related error messages and return the information back to the application program in Register 14 whenever XDS discovers an XOSF document processing error during the CLOSE process, as opposed to the WRITE/CHECK process.

The return code is X'FF' in the high order byte of Register 14. The remaining three bytes contain the 24-bit address that points to the message buffer that contains the length followed by the message text. The return code byte should be compared using the CLM assembler instruction (see example).

For more information on the EXLST parameter, refer to the *MVS/Data Administration: Macro Instruction Reference*.

Example:

```
--RETURNED INFORMATION IN R14 VIA EXLST CODE X'08' --
CLOSE(SYSUT2)CLOSE XDS OUTPUT DCB
LTRR15,R15DID CLOSE HAVE AN ERROR
BZCLOSE10NO, CHECK IF XOSF DID
*HANDLE CLOSE ERROR HERE.
CLOSE10DSOH
CLMR14,8,=X'FF'DID XDS FIND AN XOSF ERR
BNZCLOSE90NO XDS ERROR, CONTINUE
SLLR14,8CLEAR OUT RETURN CODE
SRLR14,8RESET MESSAGE TEXT ADDR
USING MSGBUF,R14MSGBUF
*PROCESS MESSAGE TEXT HERE.
*PROCESS MESSAGE TEXT HERE.
*PROCESS MESSAGE TEXT HERE.
CLOSE90DSOH
--DATA CONTROL BLOCK DEFINITION--
SYSUT2DCBDSORG=PS, MACRF=W, LRECL=80, RECFM=F, C
EXLST=$EXLST,EXIT LIST ADDRESSC
SYNAD=SYNADOOSYNAD ROUTINE ADDRESS
--EXLST PARAMETERS--
$EXLSTDSOFFULLWORD ALIGNED
DCXL1'08',AL3(0)SUPPRESS XOSF WTO MESSAGE
DCXL1'80',AL3(0)END OF EXLST PARAMETERS
```

### *Process error messages without the EXLST parameter*

If EXLST is omitted from the DCB or if either X'08' or X'09' are not active, then XDS issues message XDS1080E and the XOSF low-level error message. The XOSF message may be truncated if the message text is longer than 126 characters.

## Recovering from an abend

---

The abend recovery functions are enabled at XDS setup when you add to and modify the XDSSTART and XDSSTOP procs in the JES-controlled PROCLIB. Follow the recovery steps shown in the following sections for XOSF and XDS abends.

### After an XOSF abend

---

- Step 1.** Enter **S<sub>START</sub> XDSSTOP** to stop XDS.
- Step 2.** XOSF performs its own recovery if the XOSF ESTAE initialization parameter specifies Y.  
After recovery has completed, enter **S<sub>START</sub> XDSSTART** to restart XDS.

### After an XDS abend

---

- Step 1.** Perform normal XOSF termination. Instructions for terminating XOSF are provided in the *XPAF Operator Guide*.  
XOSF will perform its own recovery if the XOSF ESTAE initialization parameter specifies Y.
- Step 2.** Enter **S<sub>START</sub> XDSSTOP** to stop XDS.
- Step 3.** After recovery has completed, enter **S<sub>START</sub> XDSSTART** to restart XDS.

## Using XPAF with HPIP

---

High Performance Image Printing (HPIP) is a hardware/software solution that runs under the Windows NT operating system. It provides connectivity of Xerox centralized printers via TCP/IP to any number of host platforms. Additionally, the CHANNEL Adapter and Tape Client software provide connectivity to XPAF.

HPIP is designed to enable high speed printing of image-intensive laser conditioned data streams (LCDS) on a Xerox Laser Printing System (LPS). It provides these functionalities:

- New ways to connect Xerox LPSs to print clients. Previously, the Xerox LPS either accepted print jobs over a direct connection to a print client or read print jobs directly from an LPS tape drive. With HPIP, the Xerox LPS uses an indirect connection to the print client. An HPIP configuration acts as a print server, receiving print jobs from clients, spooling them for later processing, and eventually delivering them to the Xerox LPS.
- High performance support for a popular industry image file format known as Tagged Image File Format (TIFF). This support allows you to imbed your TIFF images in a Xerox LCDS in lieu of Xerox .IMG format images, or to reference these TIFF images from the LCDS without including them inline. Additionally, you can send TIFF images to HPIP in either stand-alone form or as a concatenated stream of images.

HPIP converts all TIFF images in a data stream to Xerox .IMG format. When TIFF images are referenced from an LCDS data stream, HPIP automatically retrieves them from an appropriate server. If the data stream is a pure TIFF data stream (consists entirely of TIFF images), HPIP prints one image per side of paper.

The high performance personal computer (PC) and multithreaded HPIP design allow for parallel image conversion, which enables the printer to attain maximum throughput and print speed.

Central to HPIP software is the Xerox Dynamic Document Interface (DDI). DDI provides a high bandwidth pipe for HPIP to deliver documents to Xerox LPSs. The Shared Disk Interface (SDI) software, which runs on the Xerox LPS and implements the receiving side of the DDI, receives jobs from HPIP and schedules them for printing.

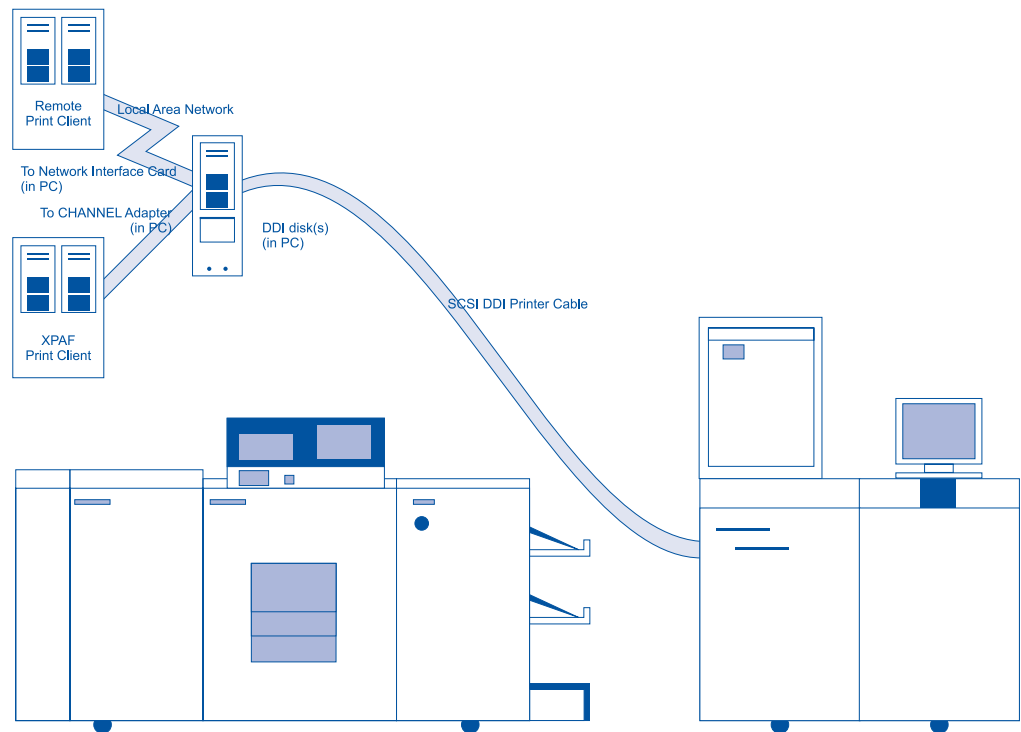
HPIP provides alternate connectivity options for Xerox printers. For this reason, data streams that do not contain inline images also can be supported. These data streams are processed through the DDI without throughput improvement, and must conform to the JDL and DJDE restrictions as discussed in the *HPIP Installation and User Guide*.

Figure 37-1 shows a sample HPIP configuration. It shows the connection methods used by print clients, the DDI interface to the Xerox LPS used by HPIP, as well as these fundamental elements of an HPIP configuration:

- Network print clients, which send documents using Line Print Request (LPR) protocols over Local Area Networks (LANs) to the HPIP PC.
- Mainframe print clients, such as XPAF, which send documents using 3480 or 3420 protocols over Bus & Tag connections to the HPIP PC.

- A high speed PC, which runs Microsoft Windows NT Server and Xerox HPIP software. The HPIP software interfaces with the Windows NT Server spooler to retrieve spooled documents and deliver them to a Xerox LPS using the Xerox DDI.
- SDI software on the Xerox LPS, which accepts documents from HPIP via the DDI and delivers them to the input and output tasks for processing.

Figure 37-1. Sample HPIP system configuration



## *Document processing overview*

---

Documents printed using an HPIP configuration pass through four distinct processing steps. This section provides an overview of each step. A more detailed description is provided in "HPIP document processing stages" later in this chapter.

## *Print client processing*

---

Print clients may be either network print clients or mainframe print clients. Network print clients send a variety of data stream types over a LAN to the HPIP PC using Berkeley Software Distribution (BSD) UNIX Line Print Request (LPR) commands. Mainframe print clients send LCDS documents to HPIP over a Bus & Tag connection using 3480 or 3420 protocols.

Within Section Four, the term "print clients" refers to both mainframe print clients and Windows NT network print clients. Where a distinction needs to be made between the two, it will be clearly stated.

## *Windows NT spool provider processing*

---

The Windows NT system on the PC receives the documents from the network print clients and places them on the print spool in queues. Each queue is represented as a separate printer in Windows NT. The Windows NT spooler and Print Manager give you added flexibility to manage documents at this point in the processing. You may choose to hold, reprint, or reprioritize the document, or schedule it for printing.

## *HPIP software processing*

---

The Windows NT spooler passes documents ready for printing to the HPIP software. HPIP acts as an extension of the Windows NT spooling system. The document is converted as required by HPIP and transmitted to the Xerox LPS using the DDI.

## *Printer (SDI software) processing*

---

The SDI task in the Xerox LPS implements the printer part of the DDI and enables printing, file transfer, and two-way communication with HPIP. Xerox SDI software provides a new level of document management, as discussed in “SDI software” later in this chapter.



---

**NOTE:** DDI refers to the architecture and interface implemented between the DDI client (HPIP) and the Xerox LPS. SDI refers to the Xerox LPS software task that implements the printer side of the DDI interface. XDDI refers to a specific version of the Operating System Software (OSS) which supports DDI and runs only on the Xerox 4090 Model 3 and 4250 printers.

---

## *Printing documents*

---

To print documents from XPAF through HPIP, submit the job as you would normally. XPAF performs the initial processing, then transfers the data stream to the HPIP PC, where the images are converted. The document is then sent for printing.

For information on setting up your printer to print through HPIP, refer to [Section Two: Installing and Customizing XPAF](#).

## Using XPAF as a client to XPSM

---

Xerox Printing Services Manager (XPSM) is a printing solution for production printing environments. XPSM is physically divided between client and server sites.

- A client site is typically a central location at which jobs to be processed by the server originate. For example, the site where your host system resides would be known as the client site.
- A server site is typically remote from the client site and is the location at which the jobs submitted by the client are received and processed by XPSM for printing. This also is the site at which the printers are located.

The client and server sites can be the same or different locations. Additionally, there can be multiple client and/or server sites.

For example, you may have one server and two printers in the same building as the host system, a second server with one printer at a location 200 miles from the host system, and a third server with six printers at a location 500 miles from the host system.

## Processing overview

---

XPAF can be used as an XPSM client, with features and functions equivalent to those offered by Xerox Print Services Client for the MVS environment (XPSC-MVS) Version 1 Release 1. Like XPSC, XPAF can act as the host-resident software that provides a two-way communication link between the host and XPSM software loaded on the RS/6000 at the server sites.

XPAF, as a client, interfaces the host-resident MVS operating system to extract jobs from the JES spooler and transmit them to the appropriate server via the LU 6.2 data communications protocol. Jobs on the JES queue can originate from any batch or online application that can write to SYSOUT.

XPAF client support is available in both the JES2 and JES3 environments on any processor that is capable of supporting MVS/ESA. Support is limited to these centralized printers: 4890, 4850, 4635, 4635MX, 4135, 4090, and 4050.

## Classifying jobs

---

Each output group sent by XPAF to the XPSM server is preceded by a data structure called a job ticket. The job ticket contains the job type which identifies the type of data stream.

XPAF uses the default job type (XSYS). If the job requires a specific XPSM conditioner, you must specify the job type in the member identified by the XPSMJOB initialization parameter. Refer to [Section Five: XPAF Parameter and Keyword Reference](#) and the *Xerox Print Resources Manager for the IBM RS/6000 Installation and User Guide* for more information.

## Job types

XPAF recognizes these job types:

Table 37-2. Job types for XPAF client support

Job type	Description
XSYS	EBCDIC SYSOUT data.
USER	Allows you to specify a user-defined job type.

## Specifying a job type

You can specify a job type by including the XJOBTYPE extended JCL keyword on the OUTPUT statement in the JCL used to submit the job. For example:

```
//outname OUTPUT XJOBTYPE=job-type
//ddname DD SYSOUT=(,),OUTPUT=*.outname
```

where

*outname* A user-defined DD name for the OUTPUT statement.

*ddname* A user-defined DD name for the SYSOUT statement.

*job-type* Must be XSYS to indicate EBCDIC SYSOUT data.

Example:

```
//job-name JOB job-information
//*
//STEP1 EXEC IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
//OUT1 OUTPUT XJOBTYPE=XSYS
//SYSUT1 DD DSN=input-library-name,DISP=SHR
//
//SYSUT2 DD SYSOUT=F,OUTPUT=*.OUT1
//
```

To specify a third-party job type supported by third-party conditioners in XPSM, you must include a statement of this form in your JCL:

```
//outname OUTPUT XJOBTYPE=(USER,job-type)
```

where

*outname* A user-defined DD name for the OUTPUT statement.

*job-type* One of the valid user-defined job types in the job type table. This table resides in a dataset identified by the XPSMJOB initialization parameter. XPAF accepts only the user job types defined in this table.

Example:

```
//job-name JOB job-information
//*
//STEP1      EXEC IEBGENER
//SYSPRINT   DD SYSOUT=*
//SYSIN      DD DUMMY
//OUT1       OUTPUT XJOBTYPE=(USER, DEFPRNTR)
//SYSUT1     DD DSN=input-library-name, DISP=SHR
//
//SYSUT2     DD SYSOUT=F, OUTPUT=*.OUT1
//
```

## Specifying a logical printer

The XPSM server allows a maximum of one physical printer per logical printer. By default, jobs submitted to the XPSM server are queued to the default logical printer. Optionally, you can specify the logical printer to which you want the job queued by including the XLDEVICE parameter in the printer's profile or the XLDEVICE extended JCL keyword on the OUTPUT statement of the JCL used to submit the job. For more information on these parameters and keywords, refer to [Section Five: XPAF Parameter and Keyword Reference](#). In this example, PRT1 is the name of an XPSM logical printer.

Example:

```
//job-name JOB job-information
//*
//STEP1      EXEC IEBGENER
//SYSPRINT   DD SYSOUT=*
//SYSIN      DD DUMMY
//OUT1       OUTPUT XLDEVICE=PRT1
//SYSUT1     DD DSN=input-library-name, DISP=SHR,
//SYSUT2     DD SYSOUT=F, OUTPUT=*.OUT1
//
```

## Downloading resources to XPSM printers (XPSC-compatibility mode only)

---

You can use the JCL shown in this section to download resources to the printer via the XPSM server. Modify this JCL with your site specific values.

### To the default logical printer

---

This JCL downloads resources from a dataset to the physical printers associated with the server's default logical printer. The job is printed on the default device using the default job type.

Replace *resource-name* with the name of the resource to download. Replace *prefix.dataset-name* with the name of the dataset that contains the resources.

Example:

```
//job-name JOB job-information
/*
//LOAD01 EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=Y
//SYSUT1 DD DISP=SHR, DSN=prefix.dataset-name(resource-name)
//SYSUT2 DD SYSOUT=(M, XP41), DCB=(RECFM=FB,
//          LRECL=129, BLKSIZE=129)
//SYSIN DD*
//          GENERATE MAXFLDS=2, MAXLINES=1,
//          RECORD FIELDS=(1, ' *', , 129), FIELDS=(128, 1, , 1)
/*
```

### To a specific printer

---

This JCL downloads the resources from a dataset to the physical printers attached to the logical printer specified by the XLDEVICE printer profile parameter or extended JCL keyword.

Replace *resource-name* with the name of the resource to download. Replace *prefix.dataset-name* with the name of the dataset that contains the resources.

Example:

```
//job-name JOB job-information
/*
//LOAD01 EXEC PGM=IEBGENER
//
//OUT1 OUTPUT XJOBTYPE=XSYS, XLDEVICE=LPR2
//SYSPRINT DD SYSOUT=Y
//SYSUT1 DD DISP=SHR, DSN=prefix.dataset-name(resource-name)
//SYSUT2 DD SYSOUT=(M, XP41), DCB=(RECFM=FB,
//          LRECL=129, BLKSIZE=129), OUTPUT=*.OUT1
//SYSIN DD*
//          GENERATE MAXFLDS=2, MAXLINES=1,
//          RECORD FIELDS=(1, ' *', , 129), FIELDS=(128, 1, , 1)
/*
```



## 38. *Using XRCBATCH*

---

The XRCBATCH utility, distributed in XPFSAMP, is a diagnostic utility used to separate a two-color RES .IMG file into one or two files. You may need to run the XRCBATCH utility if any of these situations apply to your site:

- If you have problems printing a two-color RES .IMG file, you may want to separate it into two different formats (monochrome black and monochrome color) to determine which part of the image is causing the problem.
- If you have all color printers and start using a monochrome printer, you can use this utility to create the monochrome black .IMG files from the two-color RES .IMG files before printing the jobs. This eliminates waiting for the images to be created at run time.
- If you have a colorized image for which you cannot determine the image boundary, you can use this utility to convert it to a single black image and reverse the color for the image. The background will print in black, and the image will be white, thus allowing you to see the image boundaries.

### *Processing performed*

---

When you run XRCBATCH, XPAF separates the two-color RES .IMG file into one of these file types:

- A single monochrome black .IMG file.
- A single monochrome color RES .IMG file. The color is determined by the first color of the input two-color RES .IMG file. If you specify REVVIDEO=Y, the image will print as black.
- Two separate monochrome black .IMG files, one for each color separation.
- Two separate monochrome RES .IMG files, one for each color separation. Each file will have the corresponding color of the input two-color RES .IMG file. In other words, one file will be highlight color and the other will be black.

The files can then be printed on the appropriate printer.

## Specifying file attributes

The file or files created depends on the values you specify in the COLORPRT and NUMIMAGE parameters:

- The COLORPRT parameter determines whether black or color files are created.
- The NUMIMAGE parameter determines whether one file or two files are created.

For example, if you specify COLORPRT=Y and NUMIMAGE=1, a single monochrome RES .IMG file will be created. If you specify COLORPRT=N and NUMIMAGE=2, two monochrome black .IMG files will be created.

If two separations are required, the separations will be either both monochrome black .IMG format or both monochrome RES .IMG format. The file cannot be converted to one of each format type.


## Setting up XRCBATCH


You can specify these parameters in the JCL:



**NOTE:** You cannot specify all of the parameters at one time because the IBM JCL PARM= statement limits the number of characters within the parentheses to no more than 100. Therefore, you should specify a parameter only if you require a value other than the default.

Parameter	Action
<b>COLORPRT</b>	<p>Indicates whether the printer on which the image will be printed supports color printing. This value determines whether XPAF creates a monochrome black .IMG file or a monochrome RES .IMG file.</p> <p>Valid values:</p> <ul style="list-style-type: none"> <li>Y The printer supports color printing. XPAF creates one or two monochrome RES .IMG files depending on the value specified in NUMIMAGE.</li> <li>N The printer does not support color printing. XPAF creates one or two monochrome black .IMG files, depending on the value specified in NUMIMAGE.</li> </ul> <p>Default: N</p>
<b>COMPMODE</b>	<p>Specifies the image compression mode used for converting the image file. Use this parameter only if COMPTYPE=TIME.</p> <p>Valid values:</p> <ul style="list-style-type: none"> <li>ENC Run-length encoded compression mode.</li> <li>LIN Line-predicted compression mode.</li> </ul> <p>Default: LIN</p>

Parameter	Action
<b>COMPTYPE</b>	<p>Specifies the image optimization compression type when converting raster data.</p> <p>Valid values:</p> <p>    <b>SIZE</b>    Compresses images to the smallest possible size, regardless of the length of processing time involved.</p> <p>    <b>TIME</b>    Compresses images in the quickest way, as specified in the COMPMODE parameter.</p> <p>Default: TIME</p>
<b>INPUTDDN</b>	<p>Names the native centralized image library containing the two-color RES .IMG files to be converted. This name must match the name in the input library DD statement in the JCL used to submit this job.</p> <p>Valid value: A 1- to 8-character DD name.</p> <p>Default: IMAGEIN</p>
<b>INPUTMEM</b>	<p>Specifies the member name of the two-color RES .IMG file(s) to be converted.</p> <p>Valid values:</p> <p>    <i>member-name</i>    Selects a single member (20 characters).</p> <p>    *                  Selects all members in a dataset.</p> <p>Default: *</p>
<b>LOGDSN</b>	<p>Names the dataset to be used for logging messages. This sequential dataset must have the same specifications as your XLOG dataset, but the XLOG dataset itself should not be used with this parameter.</p> <p> <b>NOTE:</b> If you do not specify the LOGDSN parameter, the dataset specified in the XPAFXLOG DD statement is used. If neither of these is specified, messages are displayed on the system console. If you do not wish to use logging, change the JCL to specify <b>DD DUMMY</b> in the XPAFXLOG DD statement.</p> <p>Valid value: A 1- to 44-character dataset name.</p> <p>Default: None</p>
<b>NUMIMAGE</b>	<p>Specifies the number of image separations to be created.</p> <p>Valid values:</p> <p>    1    Creates a single monochrome file.</p> <p>    2    Creates two separate monochrome files.</p> <p>Default: 1</p>

Parameter	Action				
<b>OUTPUTDD</b>	<p>Names the native centralized image library where the separated .IMG files will be stored. This name must match the name in the output library DD statement in the JCL used to submit this job.</p> <p>Valid value: A 1- to 8-character DD name.</p> <p>Default: IMAGEOUT</p> <p> _____</p> <p><b>NOTE:</b> The name you specify for this library must be different from the name specified for INPUTDDN.</p> <p>_____</p>				
<b>POSITION</b>	<p>Specifies the horizontal and vertical position for the image(s) to be converted.</p> <p>Valid values:</p> <table> <tr> <td>*</td> <td>Position remains unchanged.</td> </tr> <tr> <td>0</td> <td>Sets position to 0.</td> </tr> </table> <p>Default: *</p>	*	Position remains unchanged.	0	Sets position to 0.
*	Position remains unchanged.				
0	Sets position to 0.				
<b>REVVIDEO</b>	<p>Specifies whether to translate the image into reverse video on output. This translation consists of reversing the printing of all pixels in the image. For black images or when COLORPRT=N, all white pixels are printed as black, and all black pixels are printed as white. For color images and when COLORPRT=Y, all white pixels are printed as color, and all color pixels are printed as white.</p> <p>Valid values:</p> <table> <tr> <td>Y</td> <td>Reverses all pixels.</td> </tr> <tr> <td>N</td> <td>Does not reverse pixels.</td> </tr> </table> <p>Default: N</p>	Y	Reverses all pixels.	N	Does not reverse pixels.
Y	Reverses all pixels.				
N	Does not reverse pixels.				

## Executing XRCBATCH

After entering the necessary parameter values, submit the job. XPAF separates the original image into one or two files, based on the parameters you specified.

If you enter an incorrect value for any parameter or omit any parameter, XRCBATCH uses the default value. If you have specified message logging, XPAF logs the parameter values actually used as part of the output.

## *Printing the image(s)*

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After you have run XRCBATCH, perform one of these options to print the image(s):

- If you ran this utility to locate a problem within an image, make the appropriate changes. Then, resubmit the original print job, making sure you specify either the REVOVLY or REVPSEG extended JCL keyword to revise the overlay or page segment.
- If you ran this utility to create monochrome black images from colorized images, make sure any converted images are in the centralized image library used by your XPAF proc. Then resubmit the original print job, making sure you specify either the REVOVLY or REVPSEG extended JCL keyword to revise the overlay or page segment.
- If you ran this utility to verify the image boundaries, create and submit a job to print the image, making sure that you specify the library pointed to by the OUTPUTDD statement in the XRCBATCH JCL. Then resubmit the original print job, making sure you specify either the REVOVLY or REVPSEG extended JCL keyword to revise the overlay or page segment.

## *Restrictions and limitations*

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Any conversions or separations are limited one-way from interleaved raw raster data to non-interleaved raw raster data. Once an image has been separated into two images, the two images cannot be combined again to recreate the initial image.

Also, this utility only can be used for two-color RES .IMG files; it cannot be used for monochrome RES .IMG files.

## Sample JCL

This figure shows the sample JCL used to execute the XRCBATCH utility.

```
//job-name JOB job-information
//*
//*
//*
//*      *****
//*      *   THIS SAMPLE JCL IS PROVIDED TO EXECUTE THE BATCH   *
//*      *   UTILITY FOR CONVERTING XEROX TWO-COLOR RES FILES   *
//*      *   INTO EITHER ONE OR TWO .IMG FILES FOR DIAGNOSTIC   *
//*      *   PRINT PURPOSES.  CHANGE THIS JOB AS NECESSARY TO   *
//*      *   NAME THE LIBRARIES AND PARAMETERS OF YOUR CHOICE.  *
//*      *****
//*
//*
//XRCBATCH EXEC PGM=XRCBATCH, COND=(0, NE),      <--- RES CONVERT PGM
//          PARM=(' COLORPRT=N' ,      N OR Y      <--- DESTINATION PRTR
//          ' NUMIMAGE=1' ,      1 OR 2      <--- # OUTPUT IMAGES
//          ' POSITION=*' ,      * OR 0      <--- IMAGE POSITIONS
//          ' REVVIDEO=N' ,      N OR Y      <--- IMG REVERS VIDEO
//          ' INPUTDDN=IMAGEIN' ,      IMAGEIN      <--- RES INPUT DDNAME
//          ' OUTPUTDD=IMAGEOUT' ,      IMAGEOUT      <--- IMG OUTPUT DDNAM
//          ' INPUTMEM=*' )      *      <--- RES INPUT MEMBER
//STEPLIB DD DSN=prefix.XPFLOAD, DISP=SHR      <--- XPAF LOAD LIB
//IMAGEIN DD DSN=prefix.CRESLIB, DISP=SHR      <--- INPUT RES LIB
//IMAGEOUT DD DSN=prefix.CIMGLIB, DISP=SHR      <--- OUTPUT IMAGE LIB
//XPAFXLOG DD DSN=prefix.XPAFXLOG, DISP=OLD      <--- XPAF MESSAGE LOG
//
```

## Sample images

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Figure 38-1 shows a sample two-color RES .IMG input file. Figures 38-2 and 38-3 show the resulting black RES .IMG and color RES .IMG images that are output from the XRCBATCH utility.

Figure 38-1. Sample input file — two-color RES .IMG

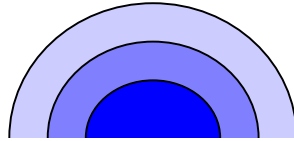


Figure 38-2. Sample output file — monochrome black RES .IMG

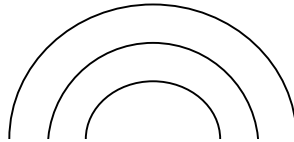


Figure 38-3. Sample output file — monochrome color RES .IMG

