
1 Preface

1.1 Brief product description

When printing in distributed and heterogeneous environments with BS2000 (SR2000 and /390), UNIX, SINIX and PC systems, documents arrive at the print service from different applications and in different print formats. In order that these documents can be printed to a specific printer, filters must be applied to the documents and print resources to convert them to a format that can be printed out by this printer.

The software product SPCONV (SPOOL-CONVERTER) implements this filter technology. SPCONV is a BS2000 subsystem which can only run in conjunction with SPOOL. Dependencies exist between the versions of SPCONV and SPOOL. Under BS2000/OSD-BC V1.0 or later, SPCONV V1.0A, which is described in this manual, can run with SPOOL V3.2A, Dprint V1.0D and RSO V3.0B.

Print files created in BS2000 for HP printers can be output to PCL printers with SPCONV V1.0A.

1.2 Target group

This manual is aimed at SPOOL administrators who are authorized to define the applicable presettings for all users as well as to edit the system files and standard print resources.

1.3 Summary of contents

This manual describes the SPCONV subsystem and its integration in SPOOL.

Chapter 2: “Filters”

Introduction to the filter system and description of the filter run.

Chapter 3: “Standard filter HP2PCL”

Description of the HP2PCL filter.

Chapter 4: “Extensions of the SPOOL command”

List of commands and operands which had to be modified because of SPCONV.

Chapter 5: “Examples”

Examples of the implementation of SPCONV in different configurations.

Chapter 6: “Installation”

Overview of program installation requirements and procedures.

Chapter 7: “Messages”

Overview of the messages output by SPCONV.

1.4 README file

Information on any functional changes and additions to the current product version described in this manual can be found in the product-specific README file. You will find the README file on your BS2000 computer under the file name SYSRME.product.version.language. The user ID under which the README file is cataloged can be obtained from your systems support staff. You can view the README file using the /SHOW-FILE command or an editor, and print it out on a standard printer using the following command:

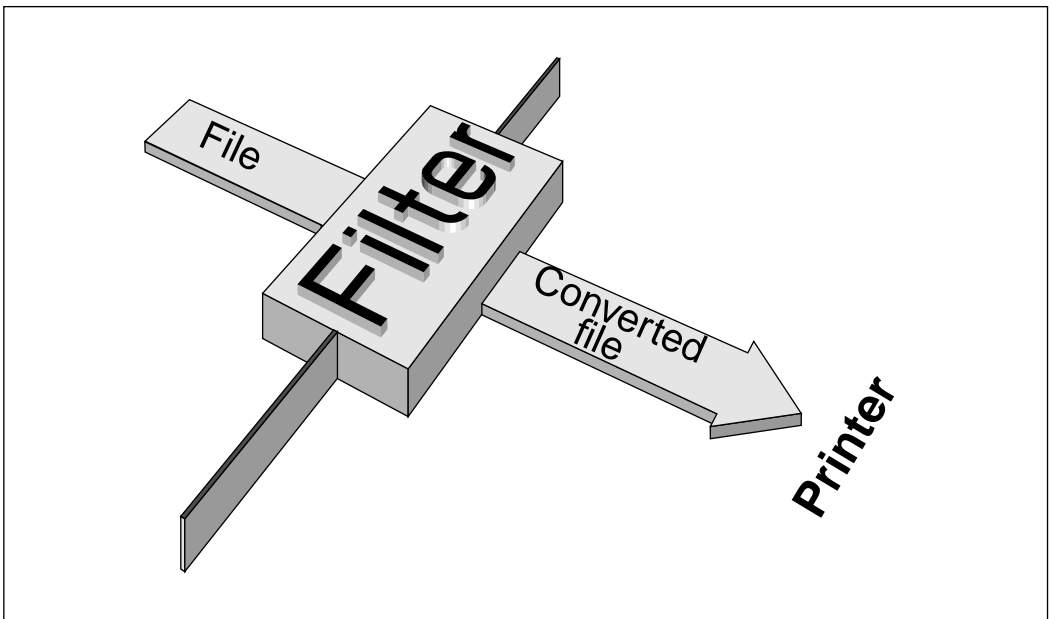
```
/PRINT-DOCUMENT FROM-FILE=filename, DOCUMENT-FORMAT=*PAGE-FORMAT(  
CONTROL-MODE=*PAGE-MODE(LINE-SPACING=*BY-EBCDIC-CONTROL))
```


2 Filters

The term “filter” refers to a program which selects information and processes this information in accordance with specific rules. A filter can implement a conversion from one output form to another, or from one format to another. For example, there are filters for converting from ASCII to EBCDIC and vice versa. Another example is the filter supplied with SPCONV, which converts HP documents for printing to PCL printers.

SPCONV uses a system of filters which enables different documents and print resources to be converted to the format required by a particular printer to print out these documents.

The filters check and modify the print jobs transferred to them and, if necessary, carry out the conversion.



2.1 Structure of the filter system

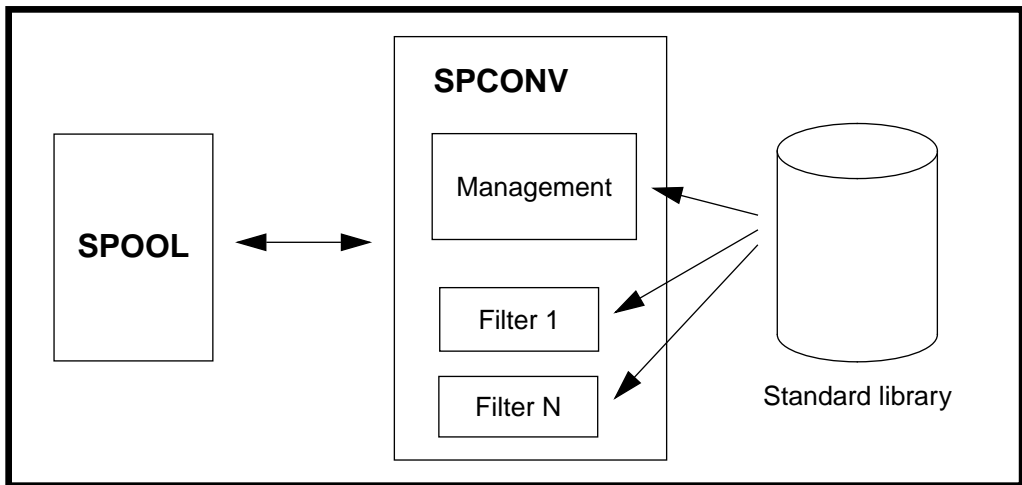
It must be possible to adapt a filter system to user requirements and different document formats. The following conditions therefore apply:

- Decoupling: it must be possible to implement new filters without having to use a new Spool & Print version.
- Extendability: it must be possible to add new filters to the standard filter system.

These conditions are met by the solutions described below.

- The filters are supplied in a separate SPCONV subsystem which contains standard filters and certain management components.
- The standard filter system can be extended by new filters which can be loaded as required. In this case, they are incorporated in the global standard library and declared in the SPOOL parameter file.

The SPCONV subsystem is called by SPOOL each time filter functionality is required and then runs under the control of the calling SPOOL task (TPR function level). SPCONV selects a suitable filter for the required conversion.



The SPCONV subsystem is started implicitly when SPOOL is started. It can be loaded or unloaded explicitly using the command `/START-SUBSYSTEM` or `/STOP-SUBSYSTEM` respectively.

The individual filters are loaded with the first call. When the call is issued, a check is first made to see whether the filter is already loaded. All filters are unloaded when the SPCONV subsystem is shut down.

2.2 Filter run

To provide the necessary flexibility and adaptation features, a filter must be able to perform the following two functions:

- modify and check the parameters of the print job
- carry out data and file conversion

Modifying and checking the parameters of the print job

Each filter can check and modify the parameters of the print jobs. This means that the filter can decide which parameters it supports, ignores, and/or rejects. To this end, the filter receives a copy of the print job with its operand values.

Converting data and files

After a print job has been accepted, the filter is called again in order to convert the original document into a new document in accordance with the parameters of the print job. This new document is then printed. To this end, the filter receives a copy of the print job with its operand values and the name of the new file to be created by the filter. The copy of the print job is saved by SPCONV before the filter is called to perform the initial check.

The filter then reads or writes the document files (original and converted) and carries out the necessary conversions.

Avoiding inconsistencies

Each filter must identify itself. To do this, it writes a signature in the parameter list via which SPOOL and SPCONV communicate with each other. Before the conversion, the filter checks the signature and only performs the conversion if the signature matches its own signature or if no signature exists as yet. This avoids any inconsistencies which could arise if several filters were to process the same print job.

The signature comprises 8 characters in any format. The standard filters use the following format for their signature: the 3 letters SYS for the system filter, 2 characters such as HP as a filter ID, 3 characters such as 10A for the filter version (corresponds to the SPCONV version). The HP2PCL filter supplied with SPCONV V1.0A uses the signature 'SYSHP10A'.

Selecting filters

The task of filters is to convert original document formats into other document formats. The filters are selected on the basis of the following criteria:

- attribute values of the document format of the print job and of the destination printer (DOCUMENT-FORMAT, TO-PRINTER)
- output formats supported by the printers defined in the configuration (SUPP-FORMAT-NAMES)
- input and output formats supported by the available filters (INPUT-FORMAT, OUTPUT-FORMAT).

It is first checked whether filtering is necessary or whether it is possible to access a printer on which the document can be printed directly. If such a printer exists, a system filter from the standard library is used.

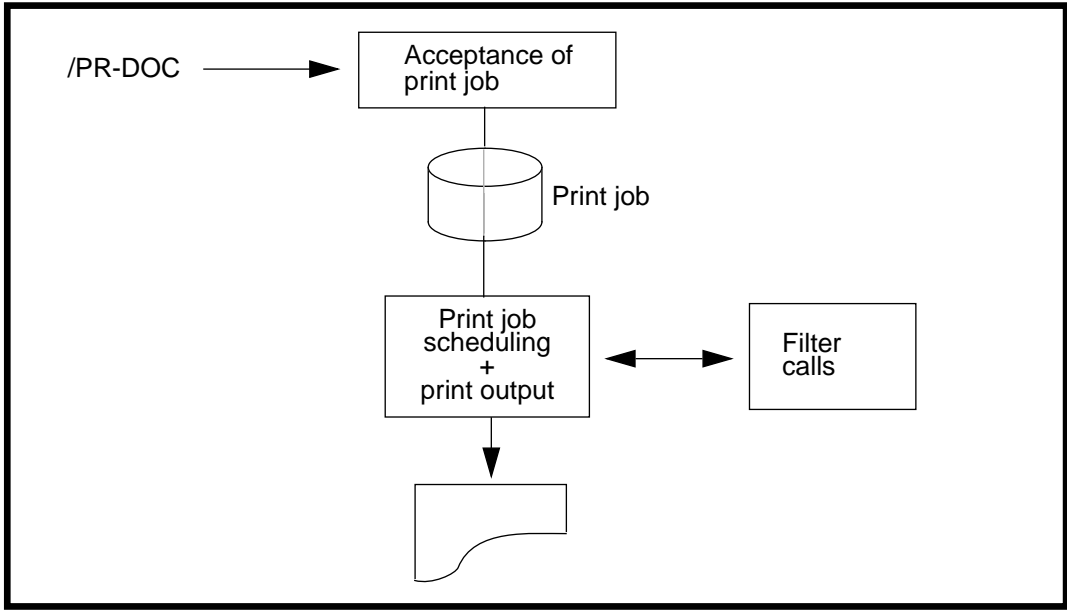
Outputting messages

The filters are responsible for outputting messages (e.g. DMS errors, problems with parameter checking).

Using virtual printers

Filters can also be implemented when using virtual printers. A virtual printer is an object which is handled in the same way as a real device but which only exists as an application addressed via a device name. Like a real device, a virtual printer can accept print jobs from SPOOL. The virtual printer forwards these jobs to a TU application, which then processes the jobs.

The diagram below illustrates the process following the issuing of a print job.



3 Standard filter HP2PCL

The HP2PCL filter is supplied with SPCONV V1.0A for converting from HP to PCL.

3.1 Operation of the HP2PCL filter

The filter converts documents created in HP format so that they can be printed successfully on a PCL printer. If no PCL printer is available locally, the converted file can be printed to an RSO printer or in a Dprint environment using Xprint.

Processing is divided into two stages:

- modification and checking of the print job
- implementation of conversion

3.1.1 Modifying and checking the print job

The filter only enables you to print documents in PAGE-FORMAT (with print data and printer control characters for laser printers). Any print job which does not specify DOCUMENT-FORMAT=*PAGE-FORMAT(CONTROL-MODE=*PAGE-MODE(CONTROL-TYPE=*HP or *COMPATIBLE)) is thus rejected by the filter in the first call.

In addition to checking the DOCUMENT-FORMAT operand, the filter modifies the document operand to DOCUMENT-FORMAT= *SPECIAL-FORMAT('PCL'). This modification enables the document to be printed on a PCL printer. Other operand values for the print job are not modified by the filter.

3.1.2 Implementing the conversion

The filter again checks the document format value of the original. It rejects the print job if DOCUMENT-FORMAT=*PAGE-FORMAT(CONTROL-MODE=*PAGE-MODE(CONTROL-TYPE=*HP or *COMPATIBLE)) is not specified.

A temporary work file is created before the filter run. The following naming conventions apply to this work file:

\$SYSSPOOL.filtername.tsn.seq#.TEMP

where:

filtername=HP2PCL

tsn=TSN of the calling task

seq#=number of a printer in a printer family (X'00'....X'FF')

The result of the filter application is a SAM file, to which the following naming conventions apply:

\$SYSSPOOL.FILTER.tsn.seq#.FILE

where:

tsn=TSN of the calling task

seq#=number of a printer in a printer family (X'00'....X'FF')

The SAM file cataloged in BS2000 has the property CODED-CHARACTER-SET=ISO88591. If a file of the same name already exists with an access method other than SAM, this file is converted to a SAM file.

The document is then converted in accordance with the specifications of the LINE-SPACING operand, i.e. the PCCs (print control characters), if any, are extracted from the data and feed control characters (X'0C') or the PCL escape sequence for the vertical cursor position are inserted.

- For LINE-SPACING=*BY-IBM-CONTROL () or *BY-ASA-CONTROL (), the PCCs are converted before interpretation to the corresponding SNI PCC values.
- For LINE-SPACING=*BY-EBCDIC-CONTROL() / *BY-IBM-CONTROL () / *BY-ASA-CONTROL (), the PCCs are then extracted from the data (the position is contained in the CONTROL-CHAR-POS operand) and interpreted in accordance with the assigned HP loop resource.

The filter implements a conversion from EBCDIC to ASCII (ISO-8859-1) if the CCSNAME (coded character set) of the file is made up of blanks or begins with 'EDF' or 'EEH'. If no CCSNAME is specified or if it is not made up of blanks or does not begin with 'EDF' or 'EEH', each character is printed as it appears in the file.

The filter converts the HP printer escape sequences into the corresponding PCL printer escape sequences. The appropriate PCL resources are assigned to the original HP resources, as prescribed by the application or the user. The PCL resources are incorporated in the output document. The print job modified in the course of the filter run is printed.

3.2 Supported HP printer features

Not all HP printer features can be mapped to PCL printers. The table below lists which functions are supported and which are not implemented.

Functions of a printer of type HP / HP90	PCL migration
--	---------------

Print parameter (/PRINT-DOCUMENT)	
Partial processing of input file (input part)	In part (for sections only)
Partial processing of input data records (record part)	Supported
Partial processing of output file (output part)	Not supported; job rejected with error message
Form	Supported
Loop	Supported
Rotation loop	Supported
Line spacing	Supported
Indentation of print output (left margin)	Supported
Multiple print, max. 255 copies (page copies)	Limited to 99 copies
Character set	Supported
Form overlay	Not supported; job rejected with error message
Form overlay buffer (FOB)	Supported
Rotation	Supported
Alternate rotation	Simulated
Feed control character	Supported
Use of EFO	Not supported; job rejected with error message

Functions of a printer of type HP / HP90	PCL migration
---	----------------------

Control character evaluation	
Line indentation	Supported
Character density)	Supported
Underscoring	Supported
Inverse printing	Not supported; these escape sequences are ignored in the printout
Spaced printing	Simulated in part (characters not widened)
Character set selection	Supported
Use of FOB	Supported
FOB suboverlay features	Not supported; this parameter ignored in the printout
Page rotation	Supported

By default, the filter accesses the system PRFILE. If a user-defined resource file is used for the output, the configuration file assigned to the HP2PCL filter must be updated to enable the filter to access the correct user file (in which the resources specified in the command are defined).

The HP resources used by BS2000 applications include forms, loop, character sets / fonts and form overlay buffers (FOBs). These HP resources can only be migrated to PCL resources in offline mode. This procedure is described in the manual "PRM V1.1A".

Recommendations for HP/HP90 forms

All available paper formats are contained in the SPOOL parameter file, since each format is assigned to one or more printer types. These formats, which are defined in the SPOOL parameter file for HP printers, must be redefined for PCL printers. These definitions can be made using the SPSEVERE statement `//ADD-SPOOL-FORM`.

Recommendations for HP fonts

The HP character sets (known as fonts in PRM) are defined either in a system PRFILE or in a user PRFILE. Each HP character set must be converted to the corresponding PCL character set. This can be implemented in PRM V1.1A by means of the `//MIGRATE-PRINT-RESOURCES` statement.

Recommendations for HP form overlay buffers (FOBs)

The HP FOBs are defined either in a system PRFILE or in a user PRFILE. Each HP FOB must be converted to the corresponding PCL overlay or PCL macro. This can be implemented in PRM V1.1A by means of the `//MIGRATE-PRINT-RESOURCES` statement.

3.3 The configuration file

The configuration file comprises a table which is used to establish the connection between the HP resources specified in the print job and the PCL resources to be used.

The file is stored as a SAM file with fixed record length under the name \$SYSSPOOL.SPCONV.HP2PCL.CFG. It can thus be edited easily using an editor such as EDT.

Each entry is structured as follows:

HP resource name	HP resource type	Host name	User ID	PCL resource name	Path
1 - 8	9 - 12	13 - 20	21 - 28	29 - 36	37 - 91
8	4	8	8	8	1 - 54

Explanation:

8 characters for the name of the HP resource

4 characters for the type of HP resource (e.g. FOB or FONT)

8 characters for the name of the host on which the print job was issued

8 characters for the user ID of the user who issued the job

8 characters for the name of the corresponding PCL resource

54 characters for the complete path name of the resource library in which the PCL resource is stored

Example

A HP resource named C1 of type FONT under user ID FRED on host D241ZE00 is replaced by PCL resource FNT. The PCL resource is contained in the file \$SYSSPOOL.PRFILE:

C1	FONT	D241ZE00	FRED	FNT	\$SYSSPOOL.PRFILE
----	------	----------	------	-----	-------------------

If the configuration file does not exist or if the resource is not available in the configuration file, the SPOOL mechanism for HP resources is used to find the PCL resource. For further information, see the USER-RESOURCES-FILE operand in the description of the PRINT-DOCUMENT command in the manual "Spool & Print Commands", and the manual "PRM V1.1A".

The table below provides an overview of the relationship between HP resources and PCL resources. The file in which the resource is defined in also specified (SP=SPOOL parameter file, PR=PRFILE).

HP resource	PCL resource
Form (SP)	Form (SP)
Loop (PR)	Simulated by HP2PCL
Character set / font (PR)	PCL font and PCL softfont (PR)
Form overlay buffer (PR)	PCL overlay and PCL macro (PR)

3.4 Calling the HP2PCL filter

A print job is transferred to SPOOL either using the PRINT-DOCUMENT command or by an application via the API interface. The document to be printed exists in HP format and the resources used are available in a system or user PROFILE.

If both the HP2PCL filter and a PCL printer are available, the job can be printed on the PCL printer, if the conversion is permitted.

As soon as the job is accepted by SPOOL, the scheduler searches for the printer most suitable for this job. It first checks the existence of a printer on which the job could be printed without conversion. If no such printer is found, it searches for a PCL printer that can print the document.

Since a conversion is necessary in this case, the job is transferred to the filter. This creates a PCL document. A corresponding PCL resource must therefore be assigned to each HP resource. This requires that the HP resources have been migrated. Following the conversion, the job is transferred to the selected printer.

Example:

- Definition of the filter in the SPOOL parameter file

```
/START-SPSERVE
//OPEN-PARAMETER-FILE PARAMETER-FILE=*SPOOL-PARAMETER
//ADD-SPOOL-FILTER FILTER-NAME=HP2PCL,
                    FILTER-LOCATION=*SYSTEM,
                    OBJECT-NAME=HP2PCL
                    INPUT-FORMAT-NAME='HP-PAGEMODE',
                    OUTPUT-FORMAT-NAME='HP-LASERJET',
//END
```

- Issuing the print job

```
/PRINT-DOCUMENT FROM-FILE=file-in-HP-mode,
                CONTROL-MODE=*PAGE-FORMAT,
                TO-PRINTER=*PARAMETERS(PRINTER-NAME=dosp0881,
                CLUSTER-NAME=sinixclu,OUTPUT-FORMAT='HP-LASERJET')
SCP1027 PRINT JOB ACCEPTED BY REMOTE CLUSTER '(&00)' WITH JOB-ID '(&01)'
```

If the filter was not defined, the command is rejected with the message:

```
SDC6000 COMMAND REJECTED BY FILTER <SIGNATUR>. REASON: '13'
```

3.5 Distributed and heterogeneous environments

The HP2PCL filter was added to Dprint as a standard Dprint filter to ensure interoperability in heterogeneous environments. This functionality will be available with Dprint V1.0D. This addition allows you to print jobs of type HP to PCL printers connected to a UNIX system via Xprint.

For further information, see the manual "Dprint V1.0B".

4 Extensions to the SPOOL commands

This chapter lists the SPOOL commands which had to be extended to accommodate the functionality of SPCONV. A detailed description of the commands can be found in the manual "Spool & Print Commands".

4.1 MODIFY-PRINT-JOB-ATTRIBUTES Modify parameters of print job

Below is a description of the operands which required modification for SPCONV.

DOCUMENT-FORMAT = *PAGE-FORMAT(...)

The file contains specific control characters for laser printers.

FORMAT-NAME = *UNCHANGED / *STD / <c-string 1..63 with-low>

FORMAT-NAME = *STD

The FORMAT-NAME is derived from the value of the CONTROL-MODE operand, i.e.:

CONTROL-MODE = *PAGE-MODE(...)

FORMAT-NAME = 'HP'

CONTROL-MODE = *APA(...)

FORMAT-NAME = 'SPDS'

CONTROL-MODE = *LOGICAL / *PHYSICAL / *LINE-MODE

FORMAT-NAME = *STD

The control characters contained in the file need not be defined as a format (i.e. they are not relevant for this operand).

FORMAT-NAME = <c-string 1..63 with-low>

Any string which names a specific file format. The file contains specific control characters.

4.2 PRINT-DOCUMENT

Output files/library elements to printer

Below is a description of the operands which required modification for SPCONV.

DOCUMENT-FORMAT = *TEXT(...)/ *PAGE-FORMAT(...)/ *SPECIAL-FORMAT(...)

DOCUMENT-FORMAT = *PAGE-FORMAT(...)

The file contains specific control characters for laser printers.

FORMAT-NAME = *STD / <c-string 1..63 with-low>

The FORMAT-NAME indicates that the file contains specific control characters of a format (e.g. HP) and names this format.

FORMAT-NAME = *STD

The FORMAT-NAME is derived from the value of the CONTROL-MODE operand, i.e.:

CONTROL-MODE = *PAGE-MODE(...)

FORMAT-NAME = 'HP'

CONTROL-MODE = *APA(...)

FORMAT-NAME = 'SPDS'

CONTROL-MODE = *LOGICAL / *PHYSICAL / *LINE-MODE

FORMAT-NAME = *STD

The control characters contained in the file need not be defined as a format (i.e. they are not relevant for this operand).

FORMAT-NAME = <c-string 1..63 with-low>

Any string which names a specific file format. The file contains specific control characters.

DOCUMENT-FORMAT = *SPECIAL-FORMAT(...)

A printer-specific language is used in the document. In this case, SPOOL and Distributed Print Services (Dprint) provide transparent control for the document, i.e. the file is transferred to an RSO or Xprint printer or to a filter without evaluation.

FORMAT-NAME = <c-string 1..63 with-low>

This operand specifies that the document to be processed has a special content type (e.g. HP LASERJET).

In the case of jobs directed to a SINIX cluster, the operand value is determined from the document format attribute transferred to the SINIX cluster.

It is interpreted by SINIX SPOOL/Xprint as the 'content type' attribute of the SINIX SPOOL/Xprint job (xpadd -job -ct...). This document content type partly fulfils ISO DPA class1, which is required for interoperability between the subsystems BS2000 Spool & Print and external spool & print systems.

In the case of jobs to RSO, the job is printed by the specified RSO printer if the printer supports the specified format name or if a filter exists which converts this format name into a format name supported by the printer.

If the value of CLUSTER-NAME refers to a BS2000 cluster or was not specified, the length of the format name is limited to 8 characters. If the value of FORMAT-NAME is longer than 8 characters in this case, the command is rejected. The file to be printed is processed by a printer which understands the specified format name.

In each case, the printer must have been defined with the format name in the SPOOL parameter file.

HEADER-PAGE-TEXT = *UNCHANGED / *NONE / <c-string 1..32 with-low>

As information about the printer to which the print jobs are sent, the HP2PCL filter needs to know whether this printer supports page rotation and/or duplex printing and which type of paper feed is possible.

For reasons of interoperability, the device description is contained in the remote domain and is therefore not available for local device management. The values for these specifications must therefore be specified in the PRINT-DOCUMENT command in the HEADER-PAGE-TEXT operand as <c-string 1..32 with-low>. Specification is in the form of a list enclosed in single quotes, whereby the individual operands are separated by commas. Each operand comprises an option and the associated value. If operands are repeated, the print job is rejected. The following specifications are possible:

ROT=YES / NO

Specifies whether or not the printer supports page rotation.

DUPLEX=SINGLE / BOTH

Specifies whether or not double-sided printing is possible.

FF=LISTING / SINGLE

Specifies whether listing paper or single sheets are printed.

Example

```
HEADER-PAGE-TEXT = 'ROT=YES,DUPLEX=BOTH,FF=LISTING'
```

TO-PRINTER = *PARAMETERS(...)

Describes the required destination devices for the print job.

OUTPUT-FORMAT = <c-string 1..63 with-low>

Format name recognized and supported by the SINIX printer specified in the PRINTER-NAME operand.

Notes:

- If the filters are available on a server, the advantage is that modifications to the filters do not necessitate modifications to the versions of Spool & Print products on the individual client hosts.

To be able to use the filters on a server, two generic devices \$HP and \$HP90 are created automatically on the server host in the SPOOL parameter file during the migration to SPOOL V3.2A. To be able to access the server, the distributed (client) printers must be linked to one of these generic devices in the Dprint configuration.

- The application of filters also affects the information output on the end sheet. In this case, the information output if TRAILER-PAGE=INFO was specified in the form entry describes the job characteristics following possible modifications by the filter and no longer corresponds to the specifications of the user at the start of the print job.

4.3 SHOW-PRINT-JOB-STATUS

Request information on print jobs

Below is a description of the operands which required modification for SPCONV.

SELECT = *PARAMETERS(...)/ *ALL

Determines whether information is output on all print jobs or only on those jobs which comply with the specified criteria (SELECT = *PARAMETERS).

SELECT = *PARAMETERS(...)

Selection criteria for print jobs on which information is to be output.

**FORMAT-NAME = *ALL / list-poss(16): *TEXT / *HP / *SPDS /
<c-string 1..63 with-low>**

Print jobs whose document format names are contained in the specified list are included in the selection.

EXCEPT = *NONE / *PARAMETERS(...)

Determines whether information is output on all print jobs or whether jobs with particular characteristics (EXCEPT = *PARAMETERS) are excluded from the output.

EXCEPT = *PARAMETERS(...)

Criteria for print jobs resulting in exclusion from the output.

**FORMAT-NAME = *NONE / list-poss(16): *TEXT / *HP / *SPDS /
<c-string 1..63 with-low>**

Enables print jobs to be removed from the selection on the basis of the name of their document format.

4.4 SPSEIVE statements

- An object filter was added to the SPOOL parameter file with SPCONV V1.0. This object is managed entirely by the SPSEIVE utility routine. For further information, see the manual "SPSEIVE".

The following statements are affected:

- SHOW-SPOOL-FILTER
 - ADD-SPOOL-FILTER
 - EDIT-SPOOL-FILTER
 - MODIFY-SPOOL-FILTER
 - REMOVE-SPOOL-FILTER
- To specify the format names supported by a printer, the following SPSEIVE statements must be used:
 - SHOW-SPOOL-DEVICE
 - ADD-SPOOL-DEVICE
 - MODIFY-SPOOL-DEVICE
 - REMOVE-SPOOL-DEVICE
 - The filter process runs under the control of a special system task. To prevent the occurrence of bottlenecks with large numbers of filter jobs, several tasks can run in parallel. The maximum number of such tasks can be defined using the SPSEIVE statement MODIFY-SPOOL-PARAMETERS.

5 Examples

5.1 Transferring a HP document to a PCL printer via RSO

Prerequisites: SPOOL V3.2A, RSO V3.0B and SPCONV V1.0 have been installed and started.

To activate the standard filter HP2PCL, the SPOOL administrator must carry out the following steps:

- Define an RSO printer which supports the printing of PCL documents and on which the documents are then printed. The following SPSERVE statement is used here:

```
ADD-SPOOL-DEVICE DEVICE-NAME=dosp1111,  
                  DEVICE-TYPE=*4821-PCL-REMOTE-PRINTER,  
                  ...  
                  SUPP-FORMAT-NAMES=( *TEXT , 'PCL ' )
```

- Define the HP2PCL filter.

```
ADD-SPOOL-FILTER FILTER-NAME=HP2PCL,  
                  FILTER-LOCATION=*SYSTEM,  
                  OBJECT-NAME=HP2PCL,  
                  INPUT-FORMAT-NAME=( *HP , *TEXT )  
                  OUTPUT-FORMAT-NAME= 'PCL ' ,  
                  REDIRECTION=*REMOTE(DEVICE-NAME=dosp1111)
```

The name of the filter is HP2PCL. It is contained in the standard filter library as a type L element. The name of the standard library depends on the platform: for /390 systems it is SYSLIB.SPCONV.010, for SR2000 it is SRMLIB.SPCONV.010. The name of the L element must be the object name. This object name is used as the filter entry.

The filter accepts HP-formatted documents as input (/PRINT-DOC <myfile>, CONTROL-MODE=*PAGE-MODE) and creates documents with the format name PCL. The output is transferred automatically to the PCL printer dosp1111.

- Define formats which correspond to those of HP or HP90 and which are used for printing to the PCL printer.

```
ADD-SPOOL-FORM FORM-NAME=A4
    DEVICE-TYPE=*4821-PCL-REMOTE-PRINTER
```

All HP print jobs started in this example use A4 format.

- Migrate the HP resources to the corresponding PCL resources.

If all HP resources used are available in the system PRFILE, the SPOOL administrator can convert this PRFILE in order to create the corresponding PCL resources. The statement `MIGRATE-PRINT-RESOURCES *ALL,$SYSSPOOL.PRFILE` creates the corresponding PCL resources for all HP fonts and FOBs available in the `$SYSSPOOL.PRFILE` (see chapter 7, "Utility routines for migration and post-editing", in the manual "PRM V1.1A").

- All documents with the *HP format are thus transferred to the HP2PCL filter, provided there is no HP or HP90 printer in the local environment. This is the case with OSD-SVP V1.0, for example, where no HP or HP90 printer can be connected to an SR2000 system. The corresponding print jobs are transferred to the printer `dosp1111`.

Examples of print jobs which are accepted and processed by the HP2PCL filter:

```
/PRINT-DOCUMENT MYFILE,CONTROL-MODE=*PAGE-MODE,RES-DESC=*PARAMETERS (
    FORM-NAME=A4)

/PRINT-DOCUMENT MYFILE,CONTROL-MODE=*PAGE-MODE,RES-DESC=*PARAMETERS (
    FORM-NAME=A4,LOOP=L1)

/PRINT-DOCUMENT MYFILE,CONTROL-MODE=*PAGE-MODE,RES-DESC=*PARAMETERS (
    FORM-NAME=A4,CHAR-SET=F1)

/PRINT-DOCUMENT MYFILE,CONTROL-MODE=*PAGE-MODE,RES-DESC=*PARAMETERS (
    FORM-NAME=A4,OVERLAY=*P(F-O-B=01))

/PRINT-DOCUMENT MYFILE,CONTROL-MODE=*PAGE-MODE,LAYOUT-CONTROL=*PARAMETERS
    (PAGE-COPIES=5,ROTATION=90)
```

To be able to convert the documents, the parameters specified when the RSO printer is started must enable the selection of the print jobs used in the above examples. This is possible with the following command, for example: `/START-PRINTER-OUTPUT DEVICE-NAME=*RSO-PRINTER(NAME=dosp1111, FORM-NAME=A4)`.

If the print job is rerouted to an RSO printer, the `PRINTER-NAME` operand in the local `PRINT-DOCUMENT` command is ignored if it specifies a local printer. The specification is of no significance to the filter run, as the document is printed to an RSO printer in any case.

5.2 Transferring a HP document to a PCL printer under Xprint

Prerequisites: SPOOL V3.2A and Dprint 1.0D have been installed and started on the client host. The Dprint configuration enables interoperability with a remote cluster called xremote.

SPCONV has been installed and started. The HP2PCL filter is defined as follows:

```
ADD-SPOOL-FILTER
  FILTER-NAME=HP2PCLX,
  FILTER-LOCATION=*SYSTEM,
  OBJECT-NAME=HP2PCL,
  INPUT-FORMAT-NAME='HP-PAGEMODE',
  OUTPUT-FORMAT-NAME='HP-LASERJET',
  REDIRECTION=*NO
```

All HP-formatted documents can be transferred to the xremote cluster with the following **PRINT-DOCUMENT** command:

```
/PRINT-DOC myfile,CONTROL-MODE=*PAGE-MODE(CONTROL-TYPE=*HP),RES-DES=*PAR(
  CHAR=101),TO-PRINTER=*PARAMETERS(PRINTER-NAME='Xprint PCL device',
  CLUSTER=xremote,OUTPUT-FORMAT='HP-LASERJET')
```

5.3 Using a configuration file

In a distributed homogeneous environment there are two clients and one server. The server has the same configuration as illustrated in the example “Transferring a HP document to a PCL printer via RSO” on page 27. In this kind of environment, there is no distribution of PCL resources. The converted PCL resources thus reside on the server; the PCL resources are not available on the clients. Using the HP2PCL configuration file `$SYSSPOOL.SPCONV.HP2PCL.CFG`, it is possible to assign different HP resources to the clients.

By inserting the following specifications in a configuration file, the search for the PCL resources can be concentrated on a particular library:

```
101      FONT CLIENT1 <userID>      106      $<userID>.ALLPCL.RESOURCES
101      FONT CLIENT2 <userID>      106      $<userID>.ALLPCL.RESOURCES
```

If the command `/PRINT-DOC myfile,DOCUMENT-FORMAT=*PAGE-MODE(CONTROL-TYPE=*HP),RES-DESC=*PAR(CHAR-SET=101)` is entered on the host `CLIENT1` or `CLIENT2` under the user ID `<userID>`, the HP2PCL filter uses PCL font 106 from the PRFILE `$<userID>.ALLPCL.RESOURCES` on the server host.

5.4 Outputting a HP print job to a PCL printer

Outputting old HP print jobs to PCL printers constitutes a special case. In this case, “old” refers to print jobs issued during a previous session which took place either under a SPOOL version < V3.2 or for which the filter environment was not configured correctly. This may mean that the SPCONV subsystem was not loaded, that the filters were not defined correctly, or that the required format was not assigned to the printer. To be able to print out these jobs, the following steps must be performed:

- Configure the correct filter environment (with SPSEVE, see also the example on page 27).
- Start the SPCONV subsystem.
- Revalidate the print jobs using the command:

```
/MODIFY-PRINT-JOB-ATTRIBUTES *TSN(...), TO-PRINTER=*PARAMETERS(PRINTER-  
NAME=*STD)
```


6 Installation

6.1 Product components

The files supplied with SPCONV V1.0A are listed below.

File	Logical ID	Content
SYSSSC.SPCONV.010.110	SYSSSC	Subsystem declaration for BS2000/OSD-BC V1.0
SYSSSC.SPCONV.010.112	SYSSSC	Subsystem declaration for BS2000/OSD-BC V2.0
SYSSSC.SPCONV.010.120	SYSSSC	Subsystem declaration for BS2000/OSD-BC V3.0
SRMSSC.SPCONV.010	SYSSSC	Subsystem declaration for BS2000/OSD-BC V3.1
SYSLNK.SPCONV.010	SYSLNK	Object module library BS2000/OSD-BC V1.0 or later
SRMLNK.SPCONV.010	SYSLNK	Object module library for BS2000/OSD-BC V3.1
SYSNRF.SPCONV.010	SYSNRF	REP file for SPCONV V1.0
SYSMSV.SPCONV.010	SYSMSV	Message file for SPCONV V1.0 (for BS2000/OSD-BC V1.0)
SYSTEMS.SPCONV.010	SYSTEMS	Message file for SPCONV V1.0 (BS2000/OSD-BC V2.0 or later)
SYSLIB.SPCONV.010	SYSLIB	Library for macros and filters for BS2000/OSD-BC V1.0 or later
SRMLIB.SPCONV.010	SYSLIB	Library for macros and filters for BS2000/OSD-BC V3.1
SYSSII.SPCONV.010	SYSSII	IMON information file
SYSFGM.SPCONV.010.E	SYSFGM.E	English version of the Release Notice
SYSFGM.SPCONV.010.D	SYSFGM.D	German version of the Release Notice

The column "Logical ID" shows the link between the logical ID and the path name of the released delivery components and files managed by SPCONV. If the path name is modified during an SPCONV session, the new path is ignored until the next time SPCONV is loaded.

The name of the global standard library depends on the system on which SPCONV is implemented.

System	Library
/390 system	SYSLIB.SPCONV.010
SR2000 system	SRMLIB.SPCONV.010

6.2 Installation procedure

Before SPCONV V1.0A is installed, SPOOL V3.2A must be installed correctly!

To install SPCONV, the following conditions must be met:

1. The IMON information file containing all the necessary path definitions for the installation must be available on the system.
2. The subsystem declaration for SPCONV must be incorporated in the subsystem catalog of the system.
3. The files listed in section "Product components" on page 33 must be stored under \$TSOS or under a user ID specified with IMON.
4. The message file must be activated.
5. The filter library must be stored under \$TSOS or under a user ID specified with IMON.

The SPCONV subsystem is loaded implicitly when SPOOL V3.2 is loaded. To process the loaded filters, the subsystem can be explicitly unloaded and reloaded.

The commands /STOP-SUBSYSTEM SUBSYSTEM-NAME=SPCONV and /START-SUBSYSTEM SUBSYSTEM-NAME=SPCONV are available for this purpose.

7 Messages

SFL0001 : SPCONV subsystem cannot be loaded without SPOOL subsystem.

Response

Load the SPOOL subsystem by means of the /START-SUBSYSTEM command, subsequent load the SPCONV subsystem.

SFL0005 : Cascade of filters not supported in the frame of the interoperability.

SFL0006 : Memory allocation error for class (&00) memory.

Response

Contact the system administrator.

SFL0007 : System error : (&00) interface error (&01).

Meaning

An error is occurred during the use of the system interface .

(&00) : name of the system interface.

(&01) : error code returned by the system interface.

Response

response : Contact the system administrator.

SFL0008 : Filter (&00) loading failed. \$PBBND1 interface error (&01).

Meaning

An error is occurred during the loading of a filter.

(&00) : name of the filter.

(&01) : error code return by the \$PBBND1 interface.

Response

Contact the system administrator.

SFL0009 : Internal inconsistency.

Meaning

An incoherence is appeared in a table used by the filter subsystem.

Response

Stop and reload the filter subsystem.

SFL0010 : Filter selection failed to convert the input format (&00) into the output format (&01).

Response

Check the definition of the filter in the Spool Parameter file.

SFL0011 : Read error on Spool Parameter file. Check the file.

Response

Contact the Spool administrator.

SFL0012 : Filter record (&00) of Spool Parameter file cannot be read.

Meaning

The filter subsystem cannot obtain the filter record (&00) from the Spool Parameter file.

Response

Check if the filter record always exists in the Spool Parameter file or contact the Spool administrator.

SFL0020 : Tsn (&00), filter (&01) : parameter (&02) specified in the PR-DOC command is incompatible with the filter.

Meaning

The job cannot be filtered because one parameter given in the print-doc command is not supported by the filter (&01).

(&02) : - DOCUMENT-FORMAT
- EFO

Response

Modify the parameter with a mod-pr-job-attr command or cancel the job and give a new print-doc command.

SFL0021 : Tsn (&00), filter (&01) : memory allocation error for class (&02) memory.

Response

Contact the system administrator.

SFL0022 : Tsn (&00), filter (&01) : validation error. (&02) not specified.

Meaning

No value has been specified for the parameter (&02) either in the print-doc command or in the form record of the Spool Parameter file.

(&02) : - LOOP
- ROTATION-LOOP

Response

Modify the parameter with a mod-pr-job-attr command or cancel the job and give a new print-doc command.

SFL0023 : Tsn (&00), filter (&01) : DMS error (&02) during access to file (&03).

Meaning

A DMS error occurred during the access to file (&03). For more detailed information about the DMS error code enter /HELP-MSG in system mode or see the BS2000 manual SYSTEM MESSAGES.

SFL0024 : Tsn (&00), filter (&01) : (&02) (&03) cannot be read from file (&04).

Meaning

The resource specified in the user file doesnt exist or cannot be read from the resource file (&04).

(&02) : type of the resource (FONT, SOFT-FONT, LOOP, FONT-POOL,....)

(&03) : name of the resource

Response

Check the resource availability in the resource file.

SFL0025 : Tsn (&00), filter (&01) : user error while filtering of file (&02). Invalid control byte.

Meaning

An invalid control byte or an invalid control byte number has been specified at the top of the page.

Response

Check the validity of the control bytes in your file.

SFL0026 : Tsn (&00), filter (&01) : user error while filtering of file (&02). Record shorter than FIRST-REC value of the PR-DOC command.

Meaning

A record of the file (&02) has a length shorter than the value given in the FIRST-REC parameter of the print-doc command.

Response

Modify the parameter with a mod-pr-job-attr command or cancel the job and give a new print-doc command.

SFL0027 : Tsn (&00), filter (&01) : user error while filtering of file (&02). Channel specified not defined.

Meaning

The file (&02) contains a print control character (pcc) that refers a channel not defined in the loop.

Response

Use an other loop or modify your file.

SFL0028 : Tsn (&00), filter (&01) : user error while filtering of file (&02). Fob-id (&03) not found in macro (&04).

Meaning

No fob-id has been detected in the macro (&04) associated to the fob given in the print-doc command.

Response

Use an other fob or modify the macro.

SFL0029 : Tsn (&00), filter (&01) : DMS error (&02) during the creation of file (&03).

Meaning

A DMS error occurred during the access to file (&03). For more detailed information about the DMS error code enter /HELP-MSG in system mode or see the BS2000 manual SYSTEM MESSAGES.

SFL0030 : Tsn (&00), filter (&01) : (&02) record (&03) cannot be read.

Meaning

The record (&02) cannot be read from the Spool Parameter file.

Response

Check if the record is defined in the Spool Parameter file or contact the Spool administrator.

SFL0031 : Tsn (&00), filter (&01) : read error on Spool Parameter file. Check the file.

Response

Contact the Spool administrator.

SFL0032 : Tsn (&00), filter (&01) : working file (&02) already exists.

Meaning

A previous filtering for the same job or for a job having the same tsn has been unsuccessfully terminated. The intermediate file created by the filter is still present.

Response

Erase the working file.

SFL0033 : Tsn (&00), filter (&01) : SETL error on file (&02).

Response

Check the validity of the file.

SFL0034 : Tsn (&00), filter (&01) : resource file (&02) cannot be opened.

Response

Check if the resource file always exists or contact the Spool administrator.

SFL0035 : Tsn (&00), filter (&01) : configuration file (&02) not correctly created.

Meaning

The configuration file must absolutely be a SAM file with FIXED LENGTH records.

Response

Create a new configuration file with the correct characteristics.

Related publications

SPSERVE (BS2000/OSD) User Guide

Target group

This manual is addressed to nonprivileged users, RSO device administrators, Dprint cluster administrators and those responsible for BS2000/OSD system operation.

Contents

The manual describes the SPSERVE utility routine with all its statements and the SPSINF macro. It takes account of all extensions to SPOOL, RSO, SPCONV, PRM, Distributed Print Services and SPS.

SPOOL (BS2000/OSD) User Guide

Target group

This manual is directed at nonprivileged users, RSO device administrators and systems support.

Contents

The manual describes SPOOL operation with the available commands, macros and system exits. The functional extensions to PRM (creation and management of print resources) and Distributed Print Services (printing in a heterogeneous computer network) are also described. The first chapters contain information on BS2000 high-speed printers and the selection of printer attributes.

Spool & Print - Commands (BS2000/OSD) User Guide

Target group

This manual is intended for nonprivileged users, device administrators, cluster administrators, SPOOL administrators and system support staff.

Contents

The commands available for SPOOL, Dprint, RSO and SPS are described, but not those for subsystem management and job control.

RSO (BS2000/OSD) **Remote SPOOL Output** User Guide

Target group

This manual is directed at nonprivileged users, RSO device administrators and system administrators of BS2000/OSD.

Contents

The manual describes the functions and options of the three user groups with respect to utilizing and controlling decentralized printers (RSO printers) and deals with the technical characteristics of all RSO printers, the RSO-relevant commands and macros.

Distributed Print Services(BS2000/OSD) Printing in Computer Networks User Guide

Target group

This manual is intended for nonprivileged users, device administrators and systems support of BS2000/OSD.

Contents

The manual provides descriptions of the principles, use and administration of Distributed Print Services, together with the associated commands and operands, for each of these user groups. Possible uses of Distributed Print Services are illustrated by examples.

PRM (BS2000/OSD) User Guide

Target group

This manual is intended for SPOOL users, system support staff and RSO device administrators.

Contents

The manual describes the PRM utility routine for creating and managing print resources for BS2000 SPOOL. Use of PRM is mandatory when working with SPOOL. The manual describes the two PRM user interfaces: the SDF statements for interactive and batch mode and the FHS-based menu interface for interactive mode.

Spool & Print - Messages (BS2000/OSD)

SPOOL, RSO, SPSEVERE, PRM, Distributed Print Services

User Guide

Target group

This manual addresses systems support, RSO device administrators and nonprivileged users.

Contents

Messages for SPOOL, RSO, SPSEVERE, PRM and Distributed Print Services. The English message texts and meaning and response texts are included in the manual. Guaranteed messages are marked.

SPS / BS2000 - APA

User Guide

Target group

The manual addresses SPOOL users and systems support.

Contents

This manual describes printing on APA printers with the SPOOL subsystem SPS. Installation of SPS and APA printers, creation and provision of print file and print resources, printing and page presentation methods, and error handling are described.

SDF (BS2000/OSD)

Introductory Guide to the SDF Dialog Interface

User Guide

Target group

BS2000/OSD users

Contents

This manual describes the interactive input of commands and statements in SDF format. A Getting Started chapter with easy-to-understand examples and further comprehensive examples facilitates use of SDF. SDF syntax files are discussed.

Ordering manuals

The manuals listed below and the corresponding order numbers can be found in the Siemens Nixdorf *List of Publications*. New publications are described in the *Druckschriften-Neuerscheinungen* (*New Publications*).

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SPCONV V1.0A (BS2000/OSD)

User Guide

Target group

This manual is intended for systems support staff and RSO device administrators.

Contents

The manual describes the SPCONV subsystem. Use of SPCONV is mandatory when working with SPOOL as of Version 3.2A. The manual describes the structure of the filter system and the use of filters.

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