

BC - SAP Printing Guide



HELP.BCCMPRN

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Icons

Icon	Meaning
	Caution
	Example
	Note
	Recommendation
	Syntax
	Tip

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BC - SAP Printing Guide

The SAP Printing Guide describes the functions of the SAP spool system. This cross-platform component outputs forms and documents, which are formatted and passed to a host spool system. You can control all output from the SAP System and do not need to handle any processing in the host spool system.

The main tasks of the SAP spool system are the processing and administration of print requests as well as the administration of output devices and their mapping in the SAP System.

The SAP Printing Guide includes (among other information) how to:

- [Monitor Printing in Your SAP System \[Page 10\]](#)
- [Process Output Problems \[Page 31\]](#)
- [Administer Output Devices \(Printers and Fax Devices\) \[Page 49\]](#)
- [Change the SAP Defaults for Your Printer \[Page 248\]](#)



For more information, see SAPNet: <http://sapnet.sap.com/output>, as well as the SAP Notes database (<http://sapnet.sap.com/notes>).

From Print File to Printout

From Print File to Printout

In the SAP spool system, unlike most other spool systems, the print process has two parts:

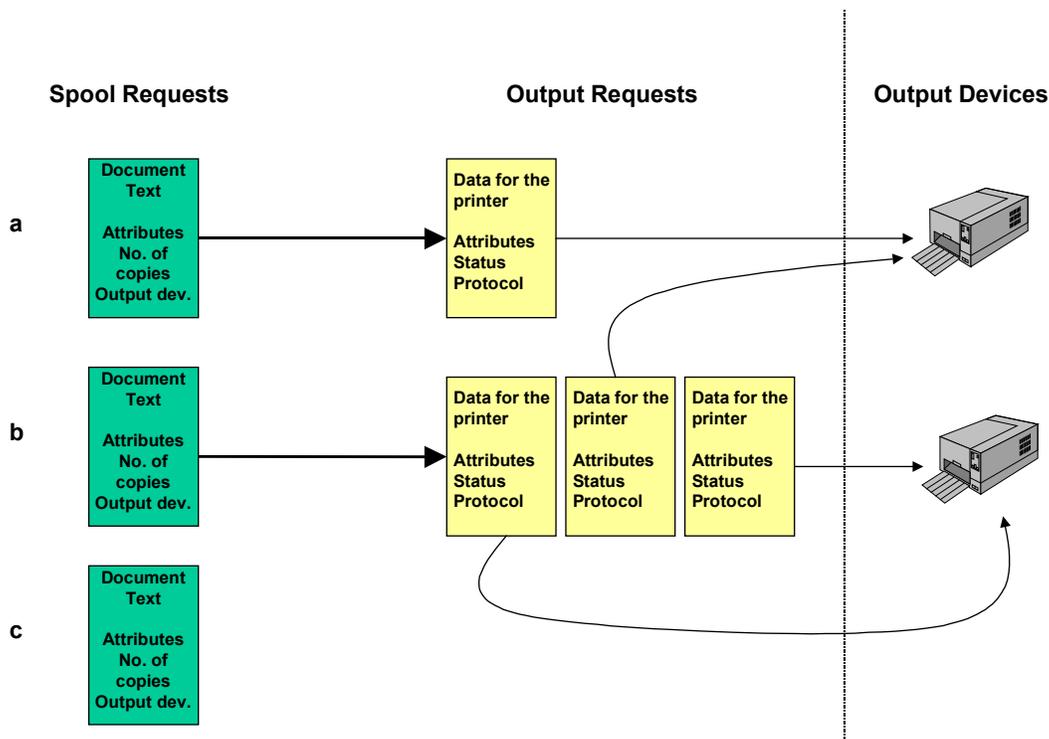
1. In the first part, a print file is created (the spool request). The spool request contains device-independent print data.
2. The output request is not created until the print file has been assigned to be printed on a specific device. To do this, the system converts the device-independent print data in the spool request into the appropriate printer language understood by the output device (for example, POSTSCRIPT, PCL-5).

The following graphic illustrates how print data is sent to the output device.

Situation a: Spool request and output request are created simultaneously (print immediately).

Situation b: An output request is created for a spool request immediately after the spool request is created. This output request is then printed on a device. Later, a user creates two additional output requests for the same spool request. These two outputs request are printed on two different devices.

Situation c: Only a spool request is created, as nothing is to be printed.



This means you can print a spool request at a later time without having to recreate the print data.

Administer spool requests and output requests using the [Output Controller \[Page 12\]](#) (transaction SP01).



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Managing Spool Requests Using the Output Controller

Output Controller: Overview

To manage spool requests, call the *Output controller* (transaction SP01). If you only want to view the status of your own spool requests, choose *System* → *Own spool requests*.

Using the output controller, you can:

- Output spool requests (send them to the host spool, for printing or output on other devices)
- Display detailed information about a spool request and change certain attributes such as destination printer, number of copies, and priority
- Display the data to be printed and download the data to a pure ASCII file
- Display output requests and track the status of a job being printed

An output request is generated:

- When a spool request is submitted with the attribute *Print immediately*
 - Each time a spool request is sent from the output controller to a printer, fax device, or other output device
- Delete spool requests.
In the output controller, you can delete individual spool requests. Note that deletion does not affect requests that have already been passed by the SAP spool system to the host spool system.



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Selecting Spool and Output Requests

To select spool and output requests, use the selection screen of the output controller (transaction SP01). You can switch between the selection screens *Spool requests* and *Output requests*.

You can specify which selection fields you want to display. To select fields, choose *Further selection criteria...* Choose from *Minimum*, *Standard*, *Extended* or *All* or select specific fields to add to your selection screen.

Users with administration authorizations are offered more selection fields than users who are only authorized to change their own requests.

Select requests by entering any combination of criteria (for example, a user, a spool request number, an output device, the date of the requests and so on). If you leave a field blank, the system displays all possible values.

For more information, such as how to enter value ranges or exclude specific values from the selection, see [Entering Selection Criteria \[Ext.\]](#).

 You want to display all spool requests created between 01.01.1999 and 01.02.1999 for the output device **PRINTER1**. On the *Spool request* selection screen, enter the date range in the *Date created* field and the name of the output device in the *Output device* field. Then choose  *Execute*.

Result

The [List of Spool Requests \[Page 14\]](#) includes the spool requests that match your selection criteria.



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List of Spool Requests

List of Spool Requests

Definition

This displays a list of requests matching the criteria you specified (see [Selecting Spool and Output Requests \[Page 13\]](#)). This includes details of the individual requests, such as date and time created, user who created the request, [Processing Status \[Page 15\]](#), number of pages, and so on.

You can tailor how this list is displayed according to your needs. You can hide or display columns, sort columns, and create variants. For more information, see [ABAP List Viewer \(ALV\): Classic \[Ext.\]](#).

Use

The following functions are available to edit the displayed spool requests:

-  [Print Request \[Page 19\]](#)
-  [Display and Change Spool Request Information \[Page 17\]](#) (for example, number of pages, or output device)
-  Delete request
-  [Display Contents of Request \[Page 16\]](#)
-  [Display Output Requests for a Spool Request \[Page 21\]](#)
- [Forward Contents of Request \[Page 16\]](#) (send using SAPoffice or export as text)



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Status of Spool Requests

The following statuses indicate the processing status of a spool request:

-	Not yet sent to the host system for printing (no output request exists)
+	Spool request is still being generated (stored in the spool system)
Waiting	The output request is awaiting processing by the spool system and has not yet been sent to the host system.
Proc. (processi ng)	The spool work process is formatting the output request for printing.
Print. (pri nting)	The output request is being printed by the host system spool. If the SAP spool system cannot get status information from the host spool, this status appears for approximately one minute. The status is then set to <i>Compl.</i> (completed) or <i>Error</i> .
Compl. (complet ed)	The output request has been successfully printed. In systems in which the spool system cannot get information from the host spool, the status is set to <i>Compl.</i> (completed) as soon as the output request has been passed to the host spool.
<F5>	More than one output request has been generated and the requests have different statuses. Some requests may not yet have a final processing status. To display the status of individual requests, choose  <i>Output requests</i> or double-click the request status.
Problem	<i>Problem</i> indicates a "minor" problem, such as characters missing from a character set. The output request was printed, but probably contains printing errors.
Error	Indicates a "severe" problem, such as a network problem. The output request could not be printed. The spool system retains such requests until you delete them or they exceed a set retention period and are deleted by a reorganization.
Archive	(for spool requests sent to an archiving device) The spool request was processed by the spool system and is waiting to be archived.
Time	The user who created the request specified a specific time when the request is to be output.



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Displaying the Contents of a Spool Request

Displaying the Contents of a Spool Request

If you want to display the contents of a spool request, select the spool request in the [Spool Request Overview \[Page 14\]](#) and choose  *Display contents*.

Adjusting display format

For technical reasons, such as for troubleshooting, it may be necessary to display the print data in either *raw form* (ABAP list format or OTF format for *SAPscript* texts) or in *hexadecimal format*.

To set the display, choose *Goto* → *Display requests* → *Settings* from the spool request list screen.

Setting display area

In order to prevent a reduction in performance, the system only displays the first ten pages of a request by default. To set the display area, choose *Goto* → *Display requests* → *Settings*. For a very large document, you can change the settings to only display the last few pages. A maximum of 9,999,999 pages can be displayed. Note however, that a display area that is too large could lead to memory overflow.

Sending spool request using SAPoffice

You can also email or fax the contents of a spool request. To do this, choose *Spool request* → *Forward* → *Send using SAPoffice*.

Exporting a spool request

You can also export the contents of a spool request as follows:

- *Spool request* → *Forward* → *Export as text*: The entire text is stored in ASCII format in your SAP GUI work directory. The name of this file is composed according to the pattern, <SAP System name><spool number>.txt. Example: Look for the file ABC0000004327.txt in your SAP GUI work directory.
- Select an entry and display the contents. For *SAPscript* texts, choose *Spool request* → *Forward* →  *Save to local file*. Then save the file in one of the possible formats. This procedure only saves the display portion of the document, however.



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Displaying and Changing Spool Request Information

To display the header information for a spool request, select the spool request from the [List of Spool Requests \[Page 14\]](#) and choose . You can select multiple requests.

You can change the following attributes, among others:

- **Output device:** If possible, only divert the output to an output device that uses the same device type as the output device where the request was originally sent. Usually, *SAPscript* texts cannot be sent to a printer that has a different device type. For ABAP lists, make sure the selected format is included in the device type of the output device to which you want to divert the output of the request.
- **Delete date:** After the spool request has passed the expiration date, it is marked for deletion. The request is deleted the next time the spool database is reorganized. For more information, see [Deleting Multiple Spool Requests Simultaneously \[Page 27\]](#).

To retain a spool request in the database, change the date specified in the *Delete date* field. You can also do this past the expiration date as long as the database has not yet been reorganized.

- **Completed, no longer possible to add to:** If this field is blank, the spool system automatically adds additional spool requests that have the same attributes (user, title, output device, client from which the request was issued, number of copies, priority, cover page setting, archiving mode, and SAP GUI session number).

For example, if a user repeatedly uses a transaction that generates a spool request, the spool system combines the requests into a single spool request. This request can then be handled as a single job for purposes of printing and spool administration.

A request is "completed" and cannot have additional jobs added to it when it has been sent to the host spool for printing. No other spool requests can be added to a spool request you generated with the *Print immediately* option set or that you sent to the printer from the output controller.

You can also close a spool request before it is printed by marking this field. The system creates a separate spool request for subsequent requests that would have been added to this request.

If you are combining requests, note the following two rules:

- If the expiration dates of combined spool requests are not the same, the spool system uses the latest date for the entire spool request.
- To print out a "combined" spool request, set the *Print immediately* option on the last of the spool requests that is to be added. The spool system adds the last spool request and then sends the entire "combined" spool request to the output device.
- **Delete after printing if no errors:** If this field is selected, the spool request, output request, and print data are deleted automatically after the request has been successfully printed.

The spool system retains spool requests that contain errors. You must manually delete such requests or allow them to expire and be deleted when the spool database is reorganized.

The delete option is set in a user's master record and can be changed:

- When a user submits a spool request

Displaying and Changing Spool Request Information

- On this screen



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Outputting Spool Requests

A spool request created without the attribute *Print immediately* set is only output after being explicitly released in the *Output controller* (transaction **SP01**). To release such a request for printing, or to print additional copies of any spool request, select the request and select  *Print directly*. You can also select multiple requests for printing.

For example, if you want to send the request to a different printer or change the number of copies to print, choose  *Print with changed parameters....*

Print with changed parameters

You can change the following settings, among others, before printing:

- *Output device*: If possible, only divert the output to an output device that uses the same device type as the output device where the request was originally sent. Usually, SAPscript texts cannot be sent to a printer that has a different device type. For ABAP lists, make sure the selected format is included in the device type of the output device to which you want to divert the output of the request.
- *Start time*: To set a later time for printing, choose this pushbutton.

After changing the parameters, choose *Print* to print the request or *Print All* (if you have selected multiple requests).



If problems occur printing extremely large output requests, such as lists larger than 10 MB, see SAP Note 7140.



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Output Request Overview

Output Request Overview

Definition

There are two ways of displaying a list of output requests:

- From the [Selection Screen of the Output Controller \[Page 13\]](#)
- From the [List of Spool Requests \[Page 14\]](#): Select the spool requests whose output requests you want to display and choose  *Output requests*.

Working with the list

You can tailor how the list is displayed according to your needs. You can hide or display columns, sort columns, and create variants. For more information, see [ABAP List Viewer \(ALV\): Classic \[Ext.\]](#).



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Status of Output Requests

You can display:

- Output requests for an individual spool request. Choose a request from the display and then choose *Output requests*.
- Using the device definition of an output device (in *Spool Administration*), you can display all output requests for a particular output device (Choose *Output requests*).

These displays provide more details about the status of output requests than are available in the spool request display. The system displays one of the following statuses for requests for which this information is available:

Waiting	The output request is waiting for or is being processed by a spool work process or spool. If this status is displayed for a request for an extended period of time (more than one minute), then the spool work process that is responsible for the request may have terminated, or there may be a problem establishing a connection to a remote output device. The spool work process automatically reprints the output request affected by the problem.
Proc. (processing)	Print data is being processed by the SAP spool work process or by the host spool.
Print. (printing)	The request has been passed to the host spool or to an output device and a final status has not yet been returned to the spool system.
Compl. (completed)	In host systems which the SAP spool system can query, this means that the request has been successfully printed, as reported to the SAP spool system by the host system or by the output device. If the spool system cannot obtain status information from the host system, then the status of a output request is set to <i>Compl.</i> as soon as the request has been passed to the host spool.
Problem	A minor error occurred while printing the request.
Error	A severe error occurred. The output request could not be printed. Use the error log to determine the cause of the error. For more information, see Reading an Error Log [Page 22] .
Scheduled (+ <i>Start time</i>)	The user who created the request has set a start time for printing the request



If you want to view a log of the events of an output request, double-click the status of a request.



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Reading Error Logs

Reading Error Logs

Any errors that occur during the processing of an output request are reported in an error log. In the output request overview, the  icon displays which requests have a log. To call the log, choose . The log reports messages from the SAP spool work process or formatting process and messages returned from the host spool, if any. The log also summarizes the attributes of the output request.

The first screen of an error log displays summary information. To display more detailed log information, choose *All info*.



The fact that a log exists, does not necessarily mean an error occurred. When defining a printer, you can specify whether print data should always be logged (for test purposes, for example). For more information, see [Logging Output Data \[Page 48\]](#).



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Frontend Printing on Local Printers

You want to print from your SAP System to the same printer you print to from your Windows PC, Apple Macintosh, or UNIX workstation. You can print to these printers using frontend printing, even if the printers themselves are not defined in the SAP spool system.

Before you can use frontend printing in your SAP System, you must create "generic" frontend output devices for the various operating system platforms. For more information, see [Definition of Frontend Printers \[Page 124\]](#).



Frontend printing only works as long as there is an active connection to the frontend. This means that frontend printing **cannot** be used in **background processing**.

Frontend printing should not be used for production or high-volume printing. For more information, see [Planning Procedure \[Page 52\]](#).

Setting Up Frontend Printing in the SAP System

Frontend print requests are processed, as for other output methods, by the spool work process. This may cause conflicts between regular print requests and frontend print requests in your SAP spool system. Even if you have classified spool servers and output devices according to the type of output (for example, production printing or mass printing), as we recommend, frontend printing may still cause server load problems.

The following describes how to configure your system to avoid these problems.

- Set up a spool service on every application server, if possible. Add the profile parameter `rsdisp/wp_no_spo` to the instance profile of each server.
- Set the maximum number of spool work processes to be used for frontend printing. The default setting is a maximum of one spool work process for frontend printing for each server. If you need to use more work processes for frontend printing, add the profile parameter `rsdisp/wp_no_Fro_max` to the instance profile and increase the value for work processes.
- To ensure that your SAP spool system can process requests as effectively as before, you should increase the number of spool work processes by at least one, as one of the spool work processes is always used for frontend printing in the standard system.

Example: In the instance profile of the application server `mn1234_YXZ_99`, the number of spool work processes is set to 1 using the profile parameter `rsdisp/wp_no_spo`. Increase this number to 2.

- Specify a spool server to be used for all frontend print requests in your SAP System. To do this, use the profile parameter `rspo/local_print/server`. In spool administration (transaction SPAD), specify an alternate server for this server, to ensure printing can continue if the first server is down.



For information about how to execute frontend printing, click [here \[Page 25\]](#).



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Frontend Printing on Local Printers

Executing Frontend Printing

Use

Using frontend printing, you can print to your local printer from the SAP System, even if this printer is not directly defined in your SAP System. This is particularly useful for employees that often log on to the SAP System at several workstations, or those often on the road.

Prerequisites

A frontend output device must be defined as a “representative” for every operating system platform. For more information, see [Defining Frontend Printers \[Page 124\]](#).

Procedure

1. When you choose *Print* anywhere in the system, the print parameters screen appears.
 - For a **Windows PC**, in the *Output device* field, enter the name of the printer your system administrator defined for frontend printing under Windows. After you confirm your entry, you can select one of the Windows printers defined on your frontend. Then choose  *Print*.
 - For a **Macintosh**, in the *Output device* field, enter the name of the printer your system administrator defined for frontend printing on Macintosh computers. Then choose  *Print*.
 - For a **UNIX workstation**, you must know the printer type of the printer you want to use (whether it is a POSTSCRIPT or a PCL printer). Then choose the printer your system administrator defined for the corresponding printer type. Then choose  *Print*.
2. On a **Windows PC**, the SAP System starts the SAPIpd transfer program, if it is not already running. Your document is sent through SAPIpd to the Windows printer.

On a **UNIX workstation** or **Macintosh**, the system outputs the document on the lpd printer. This printer must already be defined on your UNIX workstation, or in the lpd program on your Macintosh.

The lp/lpd program must already be running on UNIX and Macintosh systems when you start frontend printing.



Note the following:

- For frontend printing, a spool request (and possibly an output request) is created as for other types of SAP System printing. This means that you can view this frontend spool request, create additional printouts, and so on, in the output controller (transaction SP01).
- The status of a frontend output request is set to *Compl.*, as soon as the output request is transferred to the target workstation or PC. The system is therefore only able to log problems with communication with the PC or workstation in the output request log. Other error messages are lost.

Executing Frontend Printing

Restarting frontend printing

The user receives an error message when creating a frontend printout in the following cases:

- When the user already has six open sessions in one SAP System
- When the user specifies a frontend printer as the output device for a background job.

To output these requests, go to the list of spool requests and choose *Utilities* → *Restart frontend printing*. The requests are then printed on the printer defined for frontend printing at the terminal where the user is logged on.



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Deleting Multiple Spool Requests Simultaneously

Deleting Multiple Spool Requests Simultaneously

You can delete several spool requests at once by selecting them in the Output controller. However, if you want to delete a large number of spool requests, go to *Spool Administration*. On the *Admin.* tab page, choose *Delete old spool requests*.

You can delete:

- All spool requests whose expiration date has passed
- All spool requests older than a certain date
- All requests successfully printed
- All spool requests

When you delete a spool request you delete:

- The spool request itself (the record of the spool request in the spool database)
- The print file
 - The data in a print file is stored separately from the spool request, in the temporary sequential object database (TemSe).
- All output requests generated for the spool request.
- Any error logs
 - Error logs are stored separately from the spool request, in the temporary sequential object database (TemSe).

Background Deletion

You should delete old spool requests from the database at regular intervals. There are two ways of doing this; choose one method or the other.

- Choose *Tools* → *CCMS* → *Spool* → *Spool Administration*. On the *Admin.* tab page (administration), choose *Settings*. Then, on the *Admin.* tab page, choose *Automatically delete old spool requests* and specify an interval at which the old requests are to be deleted.
- To change deletion criteria, you can also run either report RSP00041 or RSP01041 (additional functions) in the background. Background deletion also deletes any spool data from the [TemSe Storage System \[Page 30\]](#) that has errors or is superfluous.



If you:

- Send faxes and/or telexes using the SAPoffice functions and
- Use the SAP communication server to send these faxes and telexes,

schedule a second reorganization report to run after RSP00041. This report is RSKREORG. It removes orphaned fax and telex messages; messages canceled by the user in the output controller before they were sent.



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Deleting Multiple Spool Requests Simultaneously

Checking the Consistency of the Spool Database

You can check that the tables that hold spool requests, output requests, and data are consistent with one another.

Inconsistencies should never occur. In the event of serious system problems, such as a disk failure, you can ensure that the spool system is consistent by selecting *Spool → Spool Administration* and then on the *Admin.* tab page, choose *Consistency check of spool database*.

Should inconsistencies be found, the function displays a list of database records and/or request components that are "orphaned" or which have invalid control values.

To clean up the database, mark and delete the records and components that you want to remove. The spool requests that you delete must be re-submitted to the spool system.

Consistency Check in the Background

You can also regularly check the consistency of your spool system using a background job. To do this, schedule the report RSPO1043 as a background job (transaction SM36).



For more information about the consistency check of the spool system, see SAP Notes 48400 and 98065.



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TemSe Storage System

TemSe Storage System

The spool system uses the TemSe storage system (TemSe = temporary sequential objects) to store output data. The TemSe database is also used for storing background processing job logs and other sequential objects that are temporary in nature (such as application data from FI and HR).

You can display and administer the TemSe objects using the functions provided in *Spool → TemSe contents* and *Spool → TemSe administration*. The *TemSe administration* function also lets you administer the character set buffer used by the spool system (though not the buffer used by *SAPscript*).

Retaining too many spool requests in the TemSe storage system may lead to capacity problems in the database in the SAP System. The best way to avoid space problems is to delete old spool requests daily in the background. See [Deleting Spool Requests in the Background \[Page 27\]](#). Deleting these requests also deletes the corresponding print data in the TemSe storage system.

You should also ensure, to the maximum extent possible, that users have the *Delete after output* option set in their user master records. This is especially important for users who have authorizations to execute background processing jobs and batch input sessions.



The TemSe functions in *Spool → TemSe contents* and *Spool → TemSe administration* are intended only for "emergency" use, for example for analyzing print problems by displaying output data.

Do not delete objects using these functions if you can avoid doing so. Delete old job logs and spool data using the delete functions provided in the spool and background processing systems. Deleting objects using the *TemSe* functions can result in error messages in the system log from the affected components. For example, the background processing system registers missing job logs in the system log.



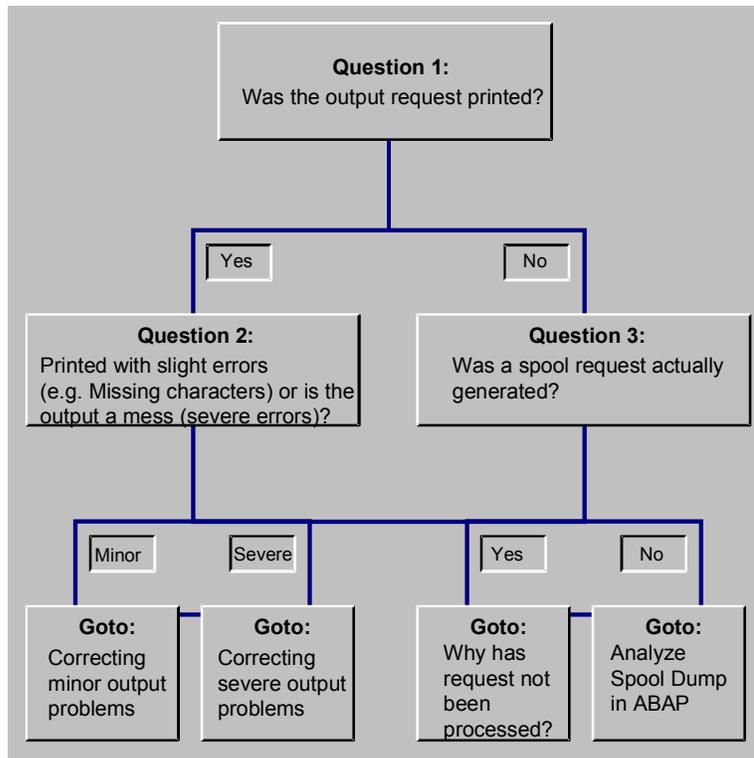
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Problem Analysis: Print-Out Missing or Incorrect

The following describes the procedure that we recommend for analyzing printing problems. This includes:

- The decisions that you must make at each step in the procedure
- The actions that you should take to correct a problem.

Identifying the problem and determining the correct analysis procedure



[Question 1: Output Request Printed? \[Page 32\]](#)

[Question 2: Minor or Severe Printing Errors? \[Page 33\]](#)

[Question 3: Spool Request Generated? \[Page 37\]](#)



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Question 1: Output Request Printed?**Question 1: Output Request Printed?****Question 1: Has the output request been printed?**

In addition to physically checking whether output has appeared, you can use the spool output controller to check on the status of a job.

Do the following:

1. Choose *Tools* → *CCMS* → *Spool* → *Output controller*.
2. Enter all available information that you have on the spool request in the selection screen.
3. If the spool request has the status:
 - (no status), then the spool request has not yet been sent to the printer. Print it to see if it is output normally.

Process, then the job is still being formatted and/or transmitted to the host system spool. You can wait to see if processing finishes normally. Or you can go to analysis procedure [Determining Why Output Request Was Not Processed \[Page 38\]](#) to check whether processing is proceeding normally.

Waiting or **Compl.** and still has not appeared at the printer, you can go directly to the analysis procedure [Determining Why Output Request Was Not Processed \[Page 38\]](#).

If the status is **Compl.**, also check the request information. Select the spool request and choose  on the *Output information* tab page. This screen shows the status of completed output requests. If *Processed but not printed* is marked, then this confirms that the output request has not been printed. Go to the error analysis procedure shown above.



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Question 2: Minor/Severe Output Problems?

Question 2: The output request has been printed, but it contains errors. Are these minor or severe printing problems?

It is important to distinguish between minor and major problems with the appearance of printed output.

A **minor problem** has occurred when the print out is legible and generally correct. However, there are problems with individual characters, with alignment of text and graphic elements, and the like. Go to the analysis procedure [Correcting Minor Output Problems \[Page 34\]](#).

A **severe problem** has occurred when a print request has printed but is not readable. Examples: the output is in the incorrect character set (for example, Dingbats) and is not readable; line breaks and formatting are incorrect. See [Correcting Severe Output Problems \[Page 35\]](#).



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Correcting Minor Output Problems

Correcting Minor Output Problems

Minor output problems occur when a document generally has been correctly printed and is legible. However, problems have occurred such as the following:

- Characters are missing or are represented by the # character.
Reason: The characters are not contained in the character set of the output device.
- Graphic elements are missing, have been incorrectly printed, or are present but unwanted.
R/3 graphic elements include color, background shading, symbols and lines, and frames.

For solutions to many minor output problems, see [SAP Notes Database](#) in SAPNet.



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Correcting Severe Output Problems

A severe output problem means your output device printed something, but the result is illegible. The wrong character set may have been used (for example, Dingbats was printed instead of alphanumeric characters). Line breaks, page breaks, or the text layout may be incorrect. Uninterpreted printer command language statements may have been printed. Or the printer may print blank pages.

If a severe problem occurs, check for the following settings:

- Was the correct device type specified in the output device definition?

Choose *Tools* → *CCMS* → *Spool* → *Spool administration*. On the *Devices / servers* tab page, enter the name of the output device in the *Output devices* field.



The device definition for a Kyocera printer incorrectly specifies device type HPLJIIID (which is for a Hewlett-Packard LaserJet printer).

- Does the emulation specified at the printer match the emulation specified in the device definition?

Many printers support multiple emulations; these printers are able to understand multiple printer languages. Emulations are switched either by an incoming print job or by way of the printer control panel. Example: a correctly-configured Hewlett-Packard LaserJet 4M printer can be switched between PostScript and PCL-5 emulations.

Do the following:

1. Check the emulation at the printer as well as in the R/3 System. You may be able to use the printer control panel to determine the emulation that is active at the printer. Or you may need to print a test sheet to see what the emulation setting is.
2. Once you have determined which emulation is active at the printer, check whether the emulation in the defined device type is the same.

Choose *Tools* → *CCMS* → *Spool* → *Spool administration*. On the *Devices / servers* tab page, enter the name of the output device in the *Output devices* field. Then choose *Device types*.

3. If the emulations do not match, try to determine why. Is the default emulation at the printer set incorrectly? Can the printer default be changed without causing problems for other output requests? Did output requests from other users change the emulation at the printer?

If the printer default cannot be changed, can you change the R/3 output device definition to match the printer default?

You can specify that the R/3 System sets the printer to the correct emulation at the start of each output request. To do this, copy the R/3 device type. Then, in the *INIT* (printer initialization) action, enter the required print command to switch the emulation. Look in your printer manual for the command to enter. The R/3 System automatically restores the default emulation at the end of a print request.

For more information, see [Editing Device Type Formats \[Page 262\]](#).

Correcting Severe Output Problems



You specify that your Hewlett-Packard printer starts in PCL-4 emulation mode (Hewlett-Packard LaserJet printer command language). However, the printer definition in the R/3 System specifies the device type POSTSCPT for the printer. This results in the following: The R/3 System sends PostScript code to a printer that is expecting commands in the PCL-4 language.

You can solve the problem in any of the following ways:

- Change the default emulation setting at the printer so that it starts in the correct emulation mode.
- Specify a compatible device type in the R/3 device definition.
- Edit the R/3 device type format so that the printer automatically switches to the correct emulation at the start of an R/3 print request.
- Is the correct character set specified in the WIN.INI file (WinCharSet parameter) for the Windows printer with device type SWIN (SAPWIN)?

Using the WinCharSet parameter, you can specify the character set and font to be used with SWIN (device type) printers. Generally, the WinCharSet parameter should not be included in the WIN.INI file or, if included, it should be set to 0.

If all SWIN output requests are printed using the wrong character set (Dingbats, for example), check the WIN.INI file. If the parameter WinCharSet is included, remove it from the file.

For more information, see [Setting the Character Set for SWIN and SAPlpd \[Page 84\]](#).

Question 3: Spool Request Generated?

Question 3:

If your output request has not yet been printed, then you must first find out whether a spool request was generated.

Do the following:

1. Choose *Tools* → *CCMS* → *Spool* → *Output controller*.
2. Enter all available information that you have on the spool request in the selection screen. Especially useful: enter the name of the user who generated the spool request and R/3 printer name (*Output device*).
3. If you find the spool request, then go to the analysis procedure [Determining Why an Output Request Has Not Been Processed \[Page 38\]](#).
4. If you do not find a spool request, then go to the analysis procedure [No Spool Request Generated: Analyzing a Spool Dump \[Page 39\]](#).



The spool request you are looking for may also have been deleted if it was processed to completion by the spool system and the user had the *Delete after output* option set.

If you do not find an ABAP dump from the spool system, then this situation has probably occurred. You should then have the user print again with the *Delete after output* option **not** set.

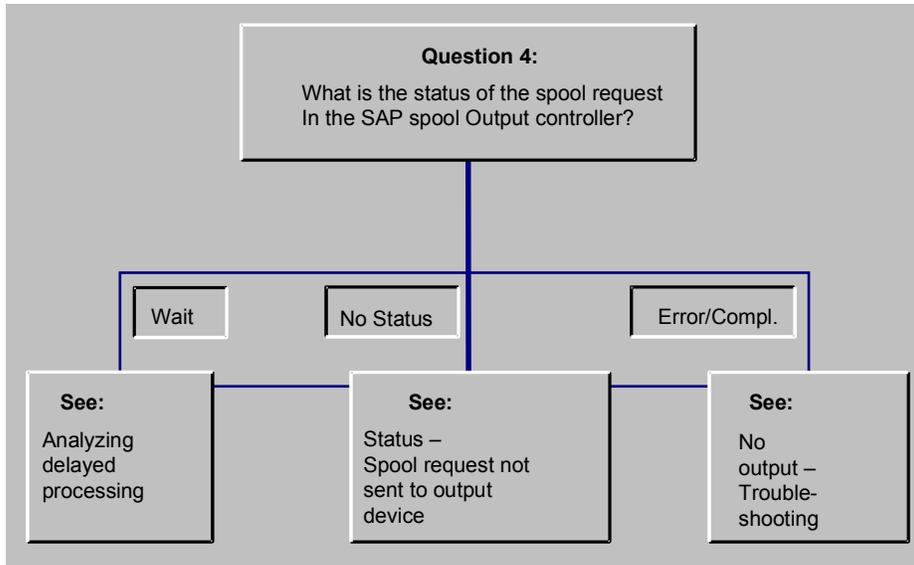


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Determining Why Output Request Was Not Processed

Determining Why Output Request Was Not Processed

Troubleshooting when no output appears at the printer

[Question 4: Status of a Spool Request? \[Page 40\]](#)[Analyzing Delayed Processing of Output Requests \[Page 41\]](#)[Analyzing "Missing Output" Problems \[Page 45\]](#)[First Page of SAP Printing Guide \[Page 1\]](#)

No Spool Request Generated: Analyzing a Spool Dump

No Spool Request Generated: Analyzing a Spool Dump

If the spool system is unable to generate a spool request when a user selects *Print*, then the spool program logic terminates the program. All the details about the abnormal termination are recorded in an ABAP short dump.

To analyze the abnormal termination or to prepare information for the R/3 hotline, choose *Tools* → *ABAP Workbench* → *Test* → [Dump analysis \[Ext.\]](#). The short dump includes the name of the affected user, the time and date, and a description of the error.



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Question 4: Status of a Spool Request?

Question 4: Status of a Spool Request?

The first step in finding out what has happened to a spool request that was not printed out is to check the status of the spool request and any output requests associated with it.

To check the status of the spool request, choose *Tools* → *CCMS* → *Spool* → *Output controller*. Enter as much information about the spool request as you have and display the request.

You will see one of the following statuses for the spool request:

- **(no status):** The spool request has not yet been sent to a printer. Use the *Print* function to print out the spool request.

A spool request is sent to a printer automatically only if a user has the *Print immediately* option marked when he or she requests a print. Otherwise, the spool request waits in the spool until it is explicitly sent to the printer or deleted.

- **Wait:** The spool request has been sent to a printer, but it has not yet been processed. Generally, an output request should be processed and sent on by the spool system within at most a couple of seconds.

When a spool request is sent to a printer, the spool system formats the output data for the printer. It then passes the resulting output request to a host spool system or print manager for output.

In this case, the output request is still waiting in the SAP spool system and has not yet been passed on to a host spool system and output device.

See [Analyzing Delayed Processing of Output Requests \[Page 41\]](#).

- **Complete or Problem:** The spool request has been sent to a printer and has been processed by the SAP spool system.
If no output appears at the printer, then see [Analyzing "Missing-Output" Problems \[Page 45\]](#).
- **<F5>:** The spool request has been sent to a printer more than once. The resulting output requests have different statuses.
- **Time:** The owner of the request set a specific time for printing the document.

Choose *F5* or *Output requests* to display the statuses of the output requests. Use the statuses of the requests to decide how to analyze the error. Example: If you see the statuses *Wait* and *Problem*, you should go to [Analyzing "Missing-Output" Problems \[Page 45\]](#) to determine what happened to the output request.

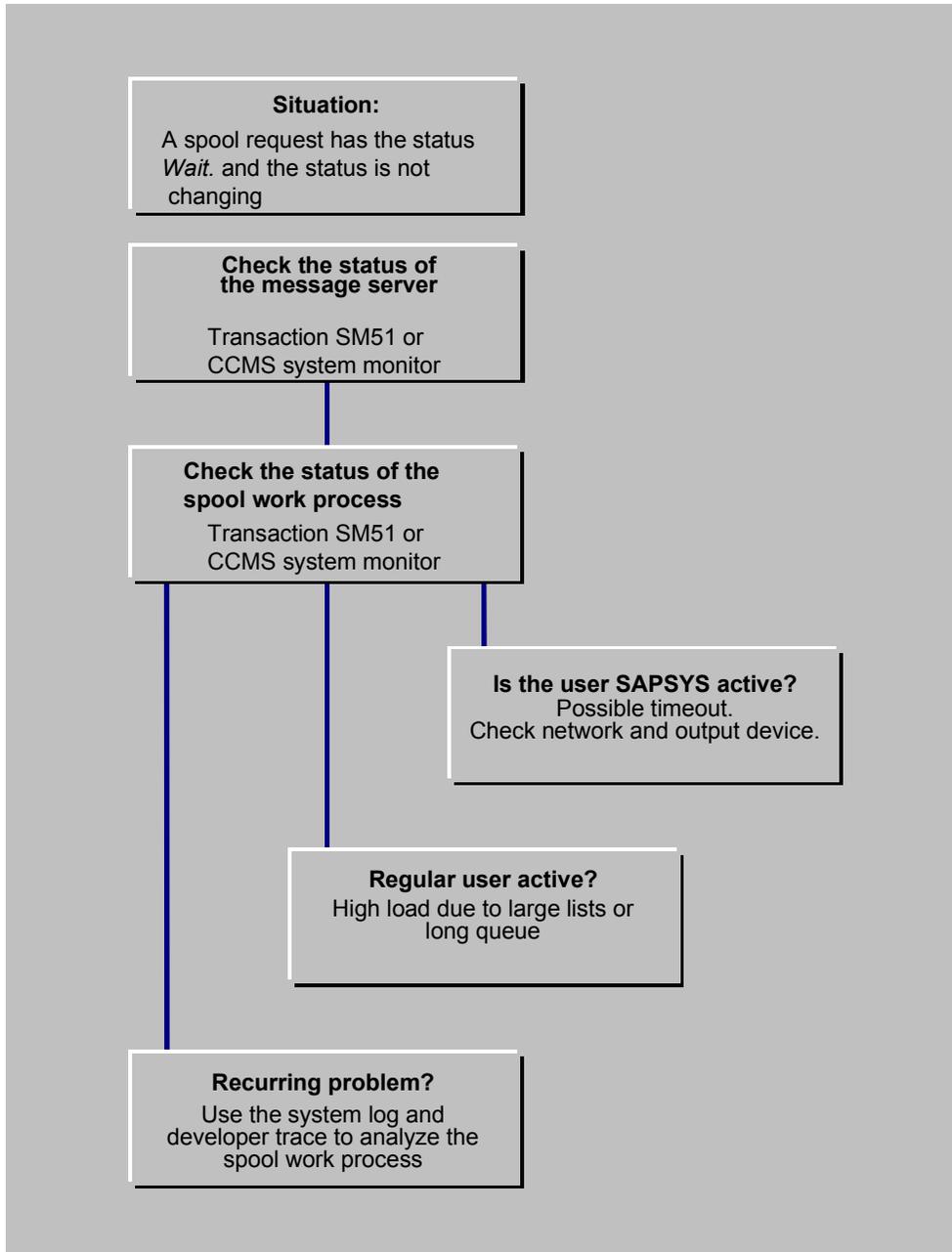


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Analyzing Delayed Processing of Output Requests

Use the following procedure to determine why an output request has not been processed by the SAP spool system. Generally, an output request should be processed and sent on by the spool system within at most a couple of seconds.

Analyzing delayed processing



Analyzing Delayed Processing of Output Requests

Check the status of the message server: If you find a lot of spool requests with the status *Waiting* in the output controller, then there may be a problem with the communication pathways within the SAP System. You can eliminate this possibility by checking that the message server of your SAP System is functioning correctly.

Use the Control Panel of the Computing Center Management System or transaction SM51 to check the message server (*Tools* → *CCMS* → *Control/Monitoring* → *Control panel*). If the message server is working correctly, then:

- The "Message Server" service should be listed in one of the application servers
- You should be able to display detail information about any of the servers in your SAP System.

Check the status of the spool work process: Status *Waiting* may also indicate that there is a problem with the spool work process that is assigned to a printer.

Do the following:

1. Find out which printer an output request has been sent to.

In the output controller, select the relevant request in the output controller and choose . You can find the printer name in the *Output device* field.

2. Find out which spool work process is responsible for the printer.

Choose *Tools* → *CCMS* → *Spool* → *Spool administration*. On the *Devices / servers* tab page, enter the name of the printer in the *Output devices* field to which the present output request has been sent. Display the definition and note the R/3 application server name that appears in the *Print server* field.

If you have only a single spool server in your SAP System, then you can omit this step.

3. Use the CCMS System Monitor or in transaction SM51 to display the application servers in your SAP System.

Check that the application server that you noted from the *Print server* field is running and that the server offers the service *Spool*. If the server is not running or if the *Spool* service is not active, then you have found the source of the problem.

Restart the server if necessary. Use the CCMS functions for defining R/3 servers (instances) and for setting up operation modes to ensure that the spool service is always active at this server.

4. If the print server is running and the spool service is active, then check the activity in the spool work process.

In transaction SM51, mark the print server in question and click on *Processes*. In the process display, look for the spool work process (Type SPO) and note the name of the active user.

- **User SAPSYS is active:** This indicates that the spool work process is busy with internal spool activities or is requesting the status of a print request from a host spool system.

Use the *CPU* function to check the spool work processes' use of the CPU. If you see no change in the CPU time after repeated use of the *CPU* function, then it is likely that the spool work process is waiting for a status query to time out. It is likely that you have then found the reason for the delay in output request processing.

If the spool work process requests status and the target host system does not reply immediately, then the spool work process must wait for the query to time out.

Analyzing Delayed Processing of Output Requests

Depending upon the spool query settings in your SAP System profile, the spool work process may wait 1 minute or more for the time-out error message from the network software. During this time, the spool work process cannot work on any other output requests.

If the spool work process waits more than 15 seconds for a reply, then it records the problem in the SAP System log. You can therefore check in the system log for devices that have chronic communication problems.

If the spool work process must wait more than 30 seconds, then it locks the output device for five minutes and goes on to other output requests. At the end of this lock period, the spool work process attempts to establish communication again. The same rules are used to limit waiting.

If the print server is a UNIX system and the *Access method* to the printer is type **L**, then you can find out which printer is being queried. Log on to the UNIX system and check with the `ps` command to see whether the spool work process has forked an LPQ or LPSTAT for the query. The `ps` display for the daughter process will show you the target system and printer of the query. You can find the PID (process ID) of the spool work process in the *SM51 Processes* display.

The spool work process also records long-running printer queries in the SAP System log. If you are unable to determine the target system and printer of a query with host-system commands, then check in the SAP System log for a time-out message. The message includes the target host and printer.

If you are able to determine which host and printer are causing the time-out problem, then you should check the status of the target host system and of the network link to the host system. The time-out wait suggests that either the host system is not active or the network link to the host system is not working.

If this problem occurs frequently, then you should turn off status querying for this output device. You can do this in the *Printer names* definition of the output device.

- **A "real user" (a normal user in your system) is active.** This indicates that the spool work process is processing an output request for a user. Any of three scenarios could account for delayed processing of other output requests:
 1. The spool work process is processing a large output request and/or is sending the output to a slow communication partner. A slow communication partner could include, for example, a host system connected by a slow WAN link or a printer that has a network card to which the spool process is directly connected (not by way of an external print server).

You can check on these possibilities in the output controller. Select all jobs for today's date and then choose *Edit* → *Sort* → *Status*. The spool system sorts spool requests by their status. If there are many spool requests with the status "Waiting", then this may indicate that the spool work process currently has too much to do and has developed a backlog. You can also check for the output request that is currently running. If it is very large (many pages in the *Pages* column of the output controller display), then this output request may have caused a temporary slowdown in printing.
 2. Multiple output requests are queued up for processing in the spool work process. If this situation occurs often and you have multiple R/3 application servers, then you should set up another spool work process at another server. Distribute the workload by printer between the two spool work processes.

Analyzing Delayed Processing of Output Requests

3. The spool work process is waiting for a time-out after trying to send an output request to a host system. For a description of this problem, see the explanations above under "User SAPSYS is active".
- **The spool work process is idle** (status *Wait* in the *Processes* display), then the spool work process may have finished processing the output request while you were starting transaction SM51.



You may also sometimes notice that the spool work process is working on the RSPWP00 program. This indicates that the work process is busy with internal spool processing. You should not interrupt processing of this program.

5. **If you are having frequent problems with delayed processing of spool requests** and/or spool work processes waiting for communications time-outs, then you may want to run your spool work processes with the R/3 developer trace switched on.

You can switch on the developer trace by adding the TRACE option to the command line with which an R/3 application server is started. These command lines are held in R/3 start-up profiles. You can also start the developer trace by setting the rdisp/TRACE option in the system profile. For more information, see "Using Developer Traces" in the [System Services \[Ext.\]](#) guide and the profile maintenance sections in the *Computing Center Management Guide*.

The information in the developer traces is highly technical. However, the trace information should let you or a consultant at least identify the host system and printer that are causing problems.



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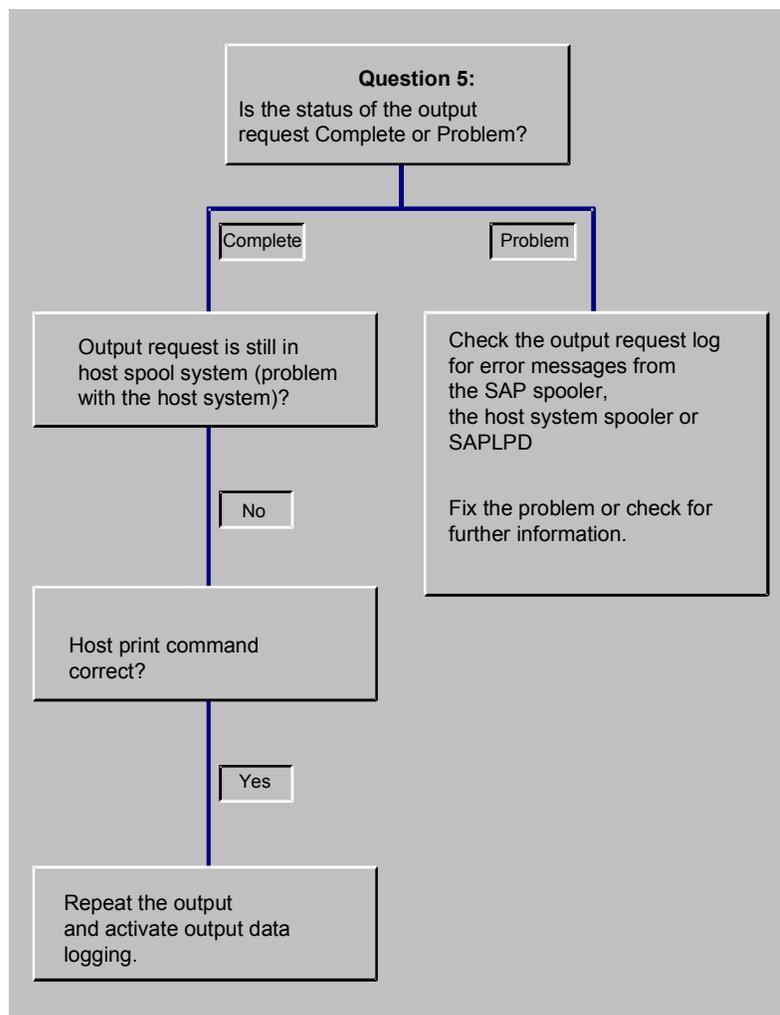
Analyzing "Missing Output" Problems

If the status of a spool request has been set to *Compl.* or *Problem* but no output is printed, then:

- The SAP spool system finished processing the spool request and is working normally
- A problem with the data in the spool request, with the printer definition in the SAP System, or with the host system spool or printer prevented any output from appearing. You can log output data to help you analyze the problem. For information about activating this logging, see [Logging Print Output Data \[Page 48\]](#).

The following graphic provides an overview of the problem analysis procedure.

Analyzing "missing output" problems



Question 5: Is the status of the output request *Complete* or *Problem*?

To check the status, do the following:

1. Choose *Tools* → *CCMS* → *Spool* → *Output controller*.

Analyzing "Missing Output" Problems

2. Enter all available information that you have on the spool request in the selection screen. Especially useful: enter the name of the user who generated the spool request and R/3 printer name (*Output device*).
3. In the spool request list, check the *Output status* column. You should see either *Problem* or *Complete*.

If you see <F5>, then there are multiple output requests with varying statuses. Press *Output requests* to display the status information.

Output request status **Complete**:

If the output request has the status *Problem*, then you can do the following to analyze the problem:

1. **Check to see if the output request is in your host system spool or print manager.** If the output request is there, then it is likely that the printing problem is somewhere in the host system. Check the status of the print request in the host spool for possible information. You should also check the printer and the local or remote connection from the host to the printer.

After you have found and corrected the problem, print the spool request again.

2. **If you did not find the output request in the host system spool, then check that the print command you are using is correct.**

In UNIX systems, you can find this command in the system profile of an application server. Choose *Tools* → *CCMS* → *Configuration* → *Profile maintenance*. Find the profile used by the application server from which the unprinted output request was sent. Then use *Extended maintenance* to check the value of the *rspo/host_spool/print* parameter. You may find this parameter set globally for your SAP System in the DEFAULT.PFL default profile.

For help in interpreting the variables in the parameter value, see [Setting Spool System Parameters \[Page 324\]](#).

Once you have found the command, try it out directly at the host system command line. If you are not able to print successfully using the command, check your host system documentation to find out what is incorrect in the command. When you have corrected the command in the SAP System profile and have restarted the system, you should be able to print output requests successfully.

If you can, try to use the command to print the host system file generated by the SAP spool system. The SAP spool system passes this file to the host spool system or print manager for printing. For help in finding print files in UNIX systems, see [Spool Data Storage Location \[Page 327\]](#). For help in finding print files in Windows and Windows for Workgroups systems, see [Setting Up SAPIpd for Printers and Fax Machines \[Page 90\]](#). No print file is created on Windows NT systems where you have specified *Access method C* for the connection between the SAP spool work process and the NT print manager.

3. **If the host print command is correct, then you should collect additional information about the output request that could not be printed.** You can use this information to identify problems with the output data itself. For information about activating this logging, see [Logging Print Output Data \[Page 48\]](#).

If you are using the SAPIpd transfer program on a Windows or Windows NT PC, then you should also try stopping and restarting the program. For information about analyzing problems in SAPIpd, see [Setting Up SAPIpd for Printers and Fax Devices \[Page 90\]](#).

Analyzing "Missing Output" Problems

Possible problems in the output data can include:

- Problems in the printer command language in the output data. If you have modified the device type formatting, make sure any printer commands you have added or altered are correct.
- Incorrect emulation activated at the printer. Example: The output request is formatted for PostScript, but the printer is set to LaserJet emulation.

Output request status is *Problem*:

If the output request has the status *Problem*, then you can do the following to analyze the problem:

1. Start the Output controller and display the spool request that has an error.

Choose the *Output requests* function to display the output requests generated from the spool request. Mark the most recent "problem" output request and choose the error log function.

The log may contain errors issued from the following sources:

- The spool work process. If you see messages about severe errors, then the data in the spool request may be corrupt or incorrect. Corrupt or incorrect data can be caused by a problem in your host system or database system or by an incorrectly programmed *ABAP* report.
- The SAPIpd transfer program. If the printer is attached to a Windows, Windows for Workgroups, or Windows NT PC and you are using the SAPIpd program to pass data to the Windows Print Manager, you may find error messages from SAPIpd in the log.
- The host spool system or print manager. If querying of the host spool system or print manager is activated, then you may see error messages from the host spool. If you are using SAPIpd on a Windows PC, SAPIpd passes error messages from the Windows print manager back to the SAP spool system for inclusion in the output request log.

If you find error messages and can correct the problems, you should then be able to print successfully.

2. If you cannot isolate and resolve the printing problem on the basis of the output request log, repeat **the print request with logging of output data switched on**. For information about activating this logging, see [Logging Output Data \[Page 48\]](#).

You can also use the *ABAP* debugging and trace functions to analyze how the output request was processed.



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Logging Output Data

Logging Output Data

If you suspect that there are problems with the output data sent to a printer, you can log this data. You can activate logging of output data for a specific printer in the *Device* definition.

Logging the data captures it in the output log. You can then display the output log and the data in the output controller by choosing *System* → *Services* → *Output controller*. The data can also be displayed in hexadecimal form (Hex.).

To activate output data logging, proceed as follows:

1. Edit the printer definition of the printer where the problems are occurring.
2. Choose *Edit* → *Test tool*.
3. Choose the amount of output data to log. You can log either the first 10KB or 100KB of output data.

For access method L, you can also display the print command. This is the command that the R/3 System uses to pass an output request to the host system spool.

Do not alter the settings of any other test tool options.

4. Save the settings and the *Device* definition to make your changes effective. Output data is logged for each output request sent to the printer until you turn data logging off.
5. After an output request has been processed, display the output log to see the data. Choose *System* → *Services* → *Output controller*. Select a spool request and choose *Goto* → *Output requests*. Then choose *Goto* → *Display requests* → *Log*. You may have to click on *More information* to display the data in the log.
6. Remember to turn off data logging when you have collected the output data you need.



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Output Devices in the SAP Spool System

Definition

The SAP spool system manages its own output devices. This includes mostly printers, but also fax and archiving devices. In order for you to use output devices defined in your operating system from the SAP System, you must define these devices in the SAP spool system.

Use

Before you start defining your output devices, you should plan the architecture of your SAP spool system. See [Planning Your SAP Printing Architecture \[Page 50\]](#) and other sections for information about:

- Which strategy we recommend to optimize your printing architecture
- Which methods the SAP spool system offers for setting up your printers and fax machines

Defining output devices

After you have planned your SAP spool system, go to the following sections to learn how to:

- [Connect Output Devices to a Windows System \[Page 66\]](#)
- [Connect UNIX Printers to the R/3 System \[Page 98\]](#)
- [Connect AS/400 Printers \[Page 105\]](#)
- [Define Devices for Frontend Printing \[Page 124\]](#)
- Use [Special Printing Functions \[Page 132\]](#) (for example, bar code and OCR printing).



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Planning Your SAP Printing Architecture

Planning Your SAP Printing Architecture

This section explains the guidelines that you should follow as you plan and implement the print output configuration of your SAP System.

Plan your printing architecture very carefully, particularly if the following printing tasks will be required in your SAP System:

- Printing of time-critical documents, such as shipping documents. The shipping documents must always be available on time to the employees in your shipping department when needed.
- High-volume printing. Your enterprise prints a large number of print requests, such as long lists and/or the total number of print requests is very high.

General Guidelines: Optimizing Printing

The following general guidelines will help you to optimize printing in your SAP System. [Planning \[Page 52\]](#) includes a description of how you determine your printing requirements and plan the correct printing architecture.

- 1.) If there are several application servers in your SAP System, set up every application server as a spool server and assign the output devices to these servers. Follow the guidelines for this task.
- 2.) Avoid setting up connections that require sending output data across the network: SAP host spool access methods U (Print on LPDHOST using Berkeley protocol) and S (Print on LPDHOST using SAP protocol). These can reduce processing speed.
- 3.) Deactivate status query by the host spool system and the print manager to optimize speed. Select the option *Do not query print requests with the operating system* in the device definition in the SAP spool system.
- 4.) If needed, deactivate the option to automatically delete output requests after successful output (The option *Delete after output* should be deactivated in the user master records)

If you deactivate the automatic deletion of spool requests after output in the user master records, activate [automatic deletion \[Page 27\]](#) of spool requests that were successfully printed.



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Planning the SAP Printing Architecture

Planning the SAP Printing Architecture

1. Identify critical printing requirements:

- Determine which users in your SAP System have time-critical printing requirements, such as shipping departments
- Identify users who regularly need to print long documents, such as long lists from ABAP reports (for cost center reports, for example).
- Estimate the total volume of output requests your SAP System will generate.

2. Based on your printing requirements, identify the critical printers in your company.

Critical printers can be printers that are used for time-critical printing, for example. Evaluate whether your existing printers can meet your estimated printing requirements and/or plan the acquisition of new equipment.

Consider whether a faster line printer might be able to speed up printing of long lists yet provide the print quality you require. Think about whether a central printing shop might be more cost-effective than small line printers in each department.

Your hardware supplier, SAP consultant, and/or the SAP Competence Centers can help you select the printers that best meet your requirements.

3. Assign your printers to one of the following three groups:

- **Time-critical printers**, such as those that print shipping labels.
 - **High-volume printers** that must print large documents, such as long lists.
 - **Non-critical printers**, those that do not have to meet any special printing requirements, such as small laser printers for light-duty printing in individual departments.
4. If you have defined three or more [Spool servers \[Page 313\]](#) in your SAP System, then **assign each group of printers to one or more of your spool servers.**

No spool server should serve more than one group of printers. Example: A spool server for printers in the time-critical group should serve only printers from this group.

You can assign a printer to a particular spool server in the *Output device* definition in the SAP spool system (*Tools* → *Administration* → *Spool* → *Spool administration*).

Assign printer groups to spool servers according to these guidelines:

- **Time-critical printers** should generally be set up for R/3 "local printing". That is, the printers should be defined in the SAP spool system with access method E (OMS printing), access method C (direct operating system call – Windows NT systems) or access method L (print locally using LP/LPR – Windows NT and UNIX systems).

This means that you should only print to time-critical printers from host systems (UNIX or Windows NT computers) that also have SAP spool servers.

Avoid connecting time-critical printers with the "remote printing" access methods. These are access methods U (Print on LPDHOST using Berkeley protocol) and S (Print on LPDHOST using R/3 protocol). These "remote printing" access methods are generally slower than R/3 "local" printing. The only exception to this guideline is when the host system meets the high reliability and high throughput requirements described in [Implementing R/3 "Remote Printing" \[Page 61\]](#). A UNIX workstation within a reliable LAN network generally meets these requirements. Printers accessed

Planning the SAP Printing Architecture

from this workstation would be defined with access method U in the SAP spool system.

Note: Problems with a printer defined with access method U or S tend to reduce performance for other printers serviced by the same spool server. Example: Assume a U or S printer cannot be accessed because its host system is not running or the network link to the host is down. When the spool server attempts to send an output request to the printer, it must wait for network time-outs to cancel the communication attempt before it can process other output requests.

With Release 4.0, you can reduce this problem by defining multiple spool work processes on your servers.

- **High-volume printers** can use any of the R/3 access methods. A high-volume printer can be accessed by the designated SAP spool server "locally", "remotely", or as a PC printer.
High-volume printers should be serviced by their own spool server so that processing of long lists does not affect other output requests.
 - **Non-critical printers** can use any of the R/3 access methods. A non-critical printer can be accessed by the designated SAP spool server "locally", "remotely", or as a PC printer.
Non-critical printers should be serviced by their own spool server so that they do not affect and are not affected by other print requests. If non-critical and high-volume printers are serviced by the same spool server, then large output requests may cause delays in processing smaller requests for office users printing on non-critical printers.
Non-critical printers should never be serviced by a spool server that services time-critical printers. Non-critical output requests may block the processing of time-critical output requests. If a non-critical printer that uses access method U or S cannot be accessed, time-critical printing may be seriously delayed.
5. When you have completed your print configuration planning, you can **set up the printers in your SAP spool system**.

The following topics provide explanations and examples of each of the printer access methods the SAP spool system supports:

- [Implementing R/3 Local Printing \[Page 59\]](#)
- [Implementing R/3 Remote Printing \[Page 61\]](#)
- [Implementing R/3 "PC Printing" \[Page 55\]](#)

For details about setting up printers, see:

- [Connecting Output Devices to a Windows System \[Page 66\]](#)
- [Connecting UNIX Printers to the SAP System \[Page 98\]](#)
- [AS/400 Printing: Installing a Printer on AS/400 \[Page 107\]](#)
- [Defining Devices for Frontend Printing \[Page 124\]](#)
- [Managing Output Devices: General Functions \[Page 207\]](#)



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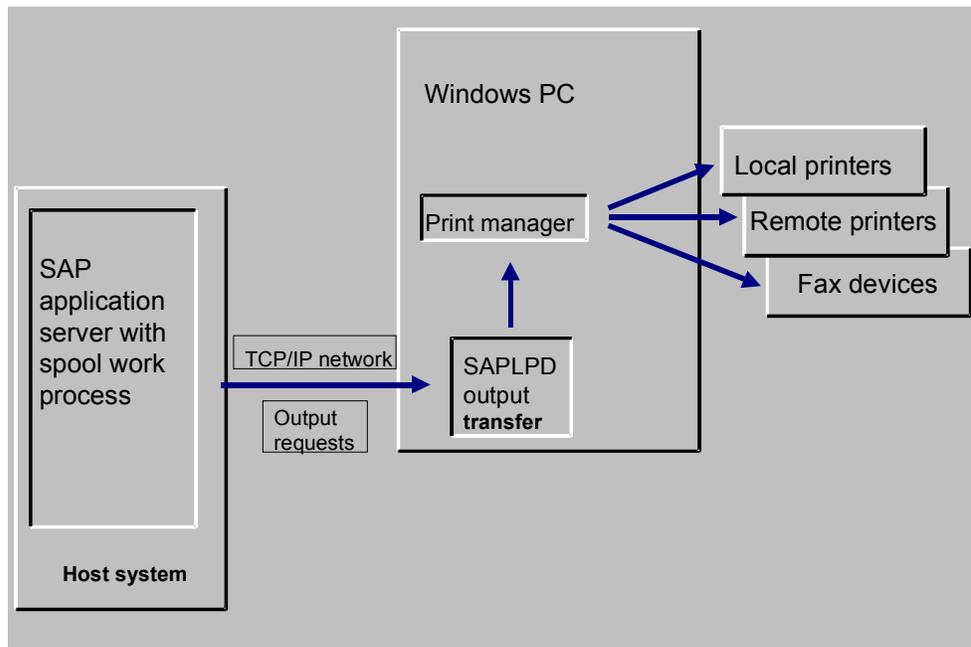
Planning the SAP Printing Architecture

Implementing PC Printing in the SAP System

Local printing as described in [Implementing R/3 Local Printing \[Page 59\]](#) is not possible with most printers connected to Windows and IBM OS/2 PC's and Apple Macintosh computers.

Only Windows NT, of available Windows systems, can support the R/3 application server with spool work process required for local printing. R/3 application servers also cannot run on IBM OS/2 PCs and Apple Macintosh computers.

SAP therefore provides its own remote-printing solution for printing from Windows PCs. This solution uses the R/3 SAPIpd program to transfer output requests from the SAP spool server to the Windows print manager. SAPIpd can run on all systems.



Prerequisites: To implement remote printing on Windows PCs, do the following:

- Install and start the SAPIpd program on a Windows PC. SAPIpd is installed with the SAP GUI frontend software.
- In the Windows print manager, define the printers and fax devices you want to use. You can use both local as well as shared devices.
- In each printer definition in the SAP spool system, specify the host system on which the spool server is running as the *Spool server* for the output device.

For *Access method*, select **S** (Print on LPDHOST using R/3 protocol) or **U** (Print on LPDHOST using Berkeley protocol).

➡ For an example, see [Example: PC Printing \[Page 57\]](#)

For more information:

- Setting up a printer under Windows: [Connecting Output Devices to a Windows System \[Page 66\]](#)

Implementing PC Printing in the SAP System

- Setting up fax devices under Windows: [Connecting Fax Devices \[Page 87\]](#)
- [Setting Up SAPIpd for Printers and Fax Devices \[Page 90\]](#)
- [Managing Output Devices: General Functions \[Page 207\]](#)



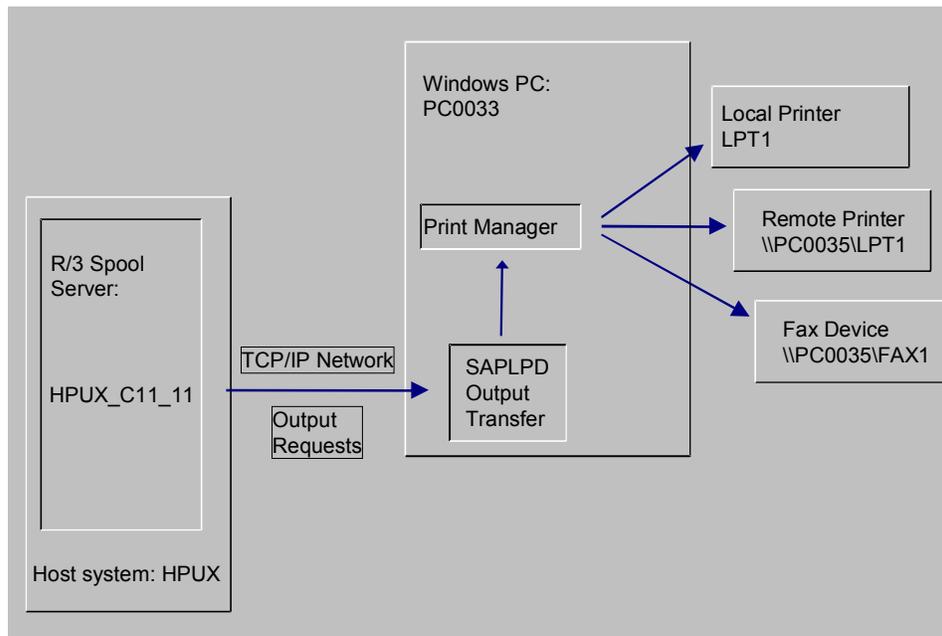
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Example: PC Printing

Assume you have the following configuration:

- An application server named C11_HPUX_11 on a UNIX workstation with the host name HPUX.
- A Windows NT PC called PC0033.

There is no R/3 application server on PC0033. You want to use SAP002 as the server for outputting R/3 data. The available output devices include the local printer SAP002P and the shared printer \\SAP003\SAP003P.



To implement this printing configuration do the following:

- Ensure that R/3 application server HPUX_C11_11 provides spool processing. You can do this by editing the application server definition in the Computing Center Management System (CCMS).
- Start the R/3 SAPLPD transfer program on PC0033. SAPLPD is installed with the SAP GUI frontend software.

To start SAPLPD automatically add the program icon to the Startup folder under *Start* → *Programs* or to the *Start* program group in the Program Manager (depending on the Windows system you are using).

- In the PC0033 print manager, define LPT1, \\PC0035\LPT1, and \\PC0035\FAX1 as output devices. LPT1 is a local printer. \\PC0035\LPT1 is a shared printer. \\PC0035\FAX1 is a shared fax machine.

The R/3 System accesses these devices in the same way by passing output requests to the print manager in PC0033.

Example: PC Printing

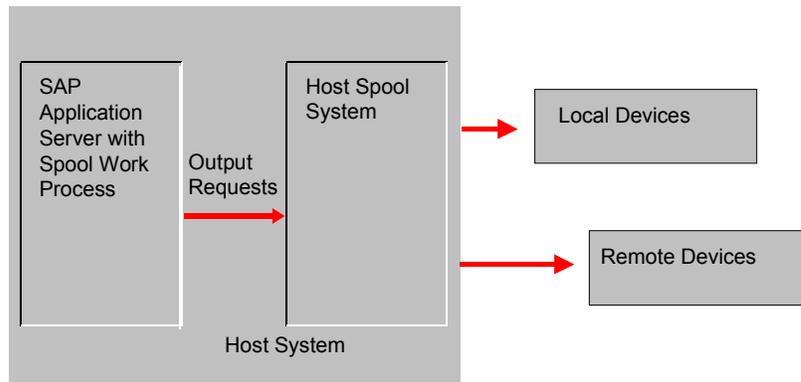
- Create definitions for these printers in the SAP spool system (*Tools* → *CCMS* → *Spool* → *Spool administration* and *Output devices*).
Specify HPUX_C11_11 as the *Spool server* for each printer and fax device.
For *Access method*, specify **S** (Print on LPDHOST using R/3 protocol) if the output device is defined with the SWIN device type. Otherwise, you can specify either *Access method U* (Print on LPDHOST using Berkeley protocol) or **S**.
- In the definition of \\PC0035\FAX1, you need to specify the following:
 - Specify SWIN as the *Device type*
 - Specify **S** (Print on LPDHOST using R/3 protocol) as the *Access method*.



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Implementing Local Printing in the SAP System

The most reliable and often the fastest method to transfer data from the SAP spool system to the host spool system is "local printing". In this connection type, the SAP spool server passes output requests to the host spool system in the same host. The spool server can then print on any local or remote printer defined in the host spool system.



Set Up Requirements: To implement local printing, you must do the following:

- [Run an SAP spool server \[Ext.\]](#) on a host system from which you can conveniently drive your printers. You can set up as many spool servers (application servers that offer the spool service) in your SAP System as you want.

Define connections in the spool system or print manager of the host to each of the printers that the SAP spool server is to use.

- In each printer definition in the SAP spool system, fill in the *Spool server* field with the name of the host system where the spool server is running.

For *Access method*, specify **L** for a UNIX host, **C** for a Microsoft Windows NT host.

➡ For an example, see [Example: Local Printing \[Page 60\]](#).

For more information, see:

- Setting up a printer under Windows: [Connecting a Printer or Fax to a Microsoft Windows System \[Page 66\]](#)
- Setting up a fax machine under Windows: [Connecting Fax Devices \[Page 87\]](#)
- [Connecting UNIX Printers to the SAP System \[Page 98\]](#)
- [AS/400 Printing: Installing a Printer on AS/400 \[Page 107\]](#)
- [Managing Output Devices: General Functions \[Page 207\]](#).

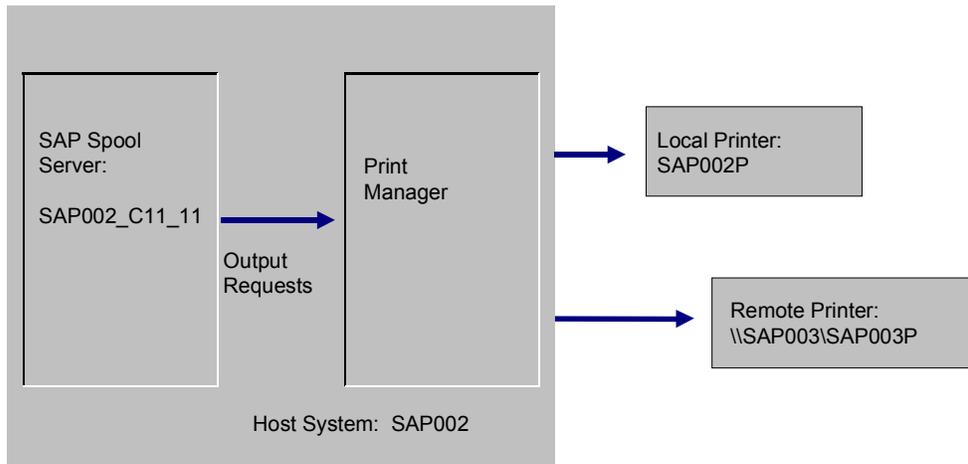


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Example: Local Printing

Example: Local Printing

Assume that you have a Windows NT PC named SAP002. You want to use SAP002 as the server for printing R/3 output. The available output devices include the local printer SAP002P and the shared network printer \\SAP003\SAP003P.



To implement this printing configuration you would need to do the following:

- Ensure that R/3 application server SAP002_C11_11 offers the spool service. You can do this by editing the application server definition in the Computing Center Management System (CCMS).
- In the SAP002 print manager, define SAP002P and \\SAP003\SAP003P as printers. SAP002P is a local printer. SAP003P is a shared remote printer.

The SAP System accesses both printers by passing output requests to the print manager in SAP002.

- Create definitions for these printers in the SAP spool system (*Tools → CCMS → Spool → Spool administration and Output devices*).

The local printer is named SAP002P. The remote printer is defined as SAP003P. SAP002_C11_11 is the spool server for both printers.

For the NT host system in this example, enter C (direct operating system call) as the host spool access method. If the host were a UNIX system, the access method would be L (Print locally via LP/LPR with signal).



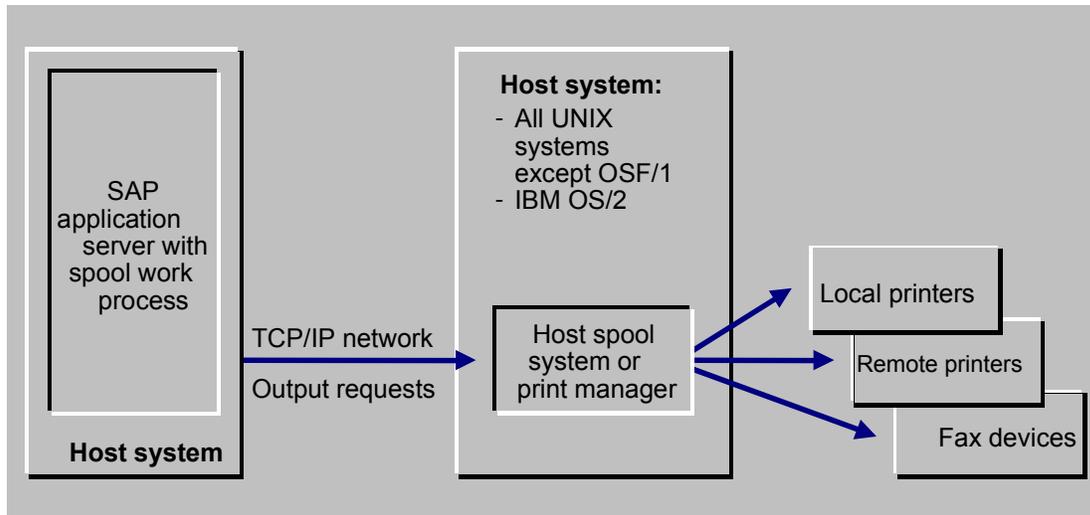
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Implementing R/3 Remote Printing (UNIX Printers)

Implementing R/3 Remote Printing (UNIX Printers)

The spool system offers a third access method for passing output data to the host spool system, "remote printing". In this access method, the SAP spool work process passes output data by way of a network link to the host spool in a UNIX system.

You can use any printer that is accessible from the host spool system, whether it is locally attached to the host or is accessed by means of host remote-printing facilities.



Important implementation considerations:

- Supported host systems:** This access method can be used with all LPD implementations (all UNIX implementations and the IBM OS/2 LPD implementation). However, only local printing is possible with OSF/1 systems. The OSF/1 spool system requires that the data sender run as the root account. However, the SAP System does not run as the root account.
- High reliability required:** This access method can lead to printing performance problems if the UNIX communication partner is not active when an output request is sent. The UNIX partner should always be available. The access method is therefore suitable only in companies that have the organization and staffing necessary to monitor their systems closely and ensure high availability.

If the UNIX partner is not active when an output request is sent to it, the spool server must wait for network time-outs to terminate the attempted communication. The spool server cannot process other output requests while it is waiting.

- Network printers:** You should not use this access method to print directly to a printer that is equipped with its own Ethernet or Token Ring card. The problem with this configuration is that the SAP spool server must restrict its transmission speed to that supported by the printer. If the printer does not have its own hard disk and you are not accessing it by way of a printer server, then data transmission to the printer can tie up the SAP spool server for considerable amounts of time.

Set Up Requirements: To implement remote printing, you must:

- Set up the printers on host systems meeting the high reliability requirements of this access

Implementing R/3 Remote Printing (UNIX Printers)

method. (See the preceding notes.)

- Run an R/3 application server with the spool service on a host system of your choice. You can set up as many spool servers (application servers that offer the spool service) in your SAP System as you want.
- In each printer definition in the SAP spool system, specify the host system in which the spool server is running as the *Spool server* of the printer.

For the *Access method*, specify **U** (Print on LPDHOST using Berkeley protocol).

➡ For an example, see [Example: Remote Printing \(UNIX\) \[Page 63\]](#)

For more information:

- [Connecting UNIX Printers \[Page 98\]](#)
- [Managing Output Devices: General Functions \[Page 207\]](#)



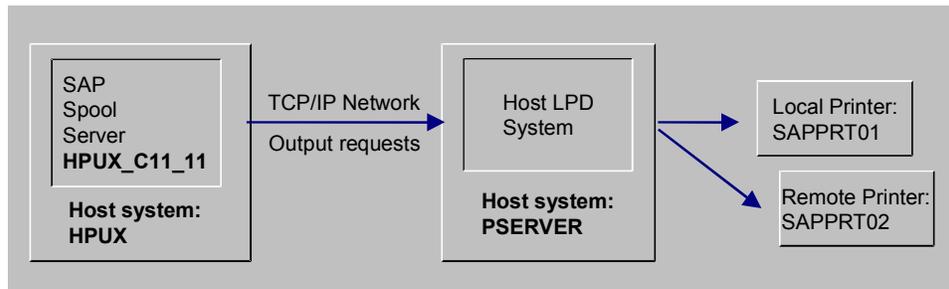
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Example: Remote Printing (UNIX)

Assume that you have the following configuration:

- An application server named C11_HPUX_11 on the UNIX workstation with the host name HPUX.
- A UNIX workstation with the host name PSERVER.

There is no R/3 application server on PSERVER. You want to use HPUX as the server for printing R/3 data. The available output devices are (among others) the local printer SAPPRT01 and the remote printer SAPPRT02.



To implement this printing configuration do the following:

- Ensure that R/3 application server HPUX_C11_11 provides spool processing. You can do this by editing the application server definition in the Computing Center Management System.
- In the PSERVER spool system, define SAPPRT01 and SAPPRT02 as printers. SAPPRT01 is a local printer. SAPPRT02 is a shared remote printer.
The SAP System accesses both devices by passing output requests to the spool system in PSERVER.
- Create definitions for these printers in the R/3 spool system (*Tools* → *CCMS* → *Spool* → *Spool administration* and *Output devices*).
Specify HPUX_C11_11 as the *Spool server* for each printer/fax machine.
For *Access method*, specify **U** (Print on LPDHOST using Berkeley protocol).



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Example: Setting Up Optimized Printer Configuration

Example: Setting Up Optimized Printer Configuration

Assume that you have the following configuration, also shown in the diagram:

- **Two non-critical printers**, SAPPRT01 and SAPPRT02. Non-critical printers are typically light-duty office printers.

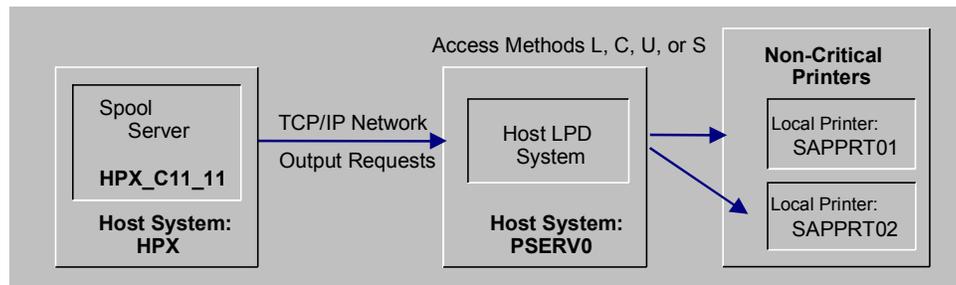
As the graphic shows, the access methods offered by the SAP spool system are suitable for passing data to these printers.

In the example, the printers are served by the R/3 spool application server HPX_C11_11 on host HPX. The printers are accessed, however, from another host system, PSERV0.

This configuration therefore uses one of the network access methods for passing output data from the spool server to the host spool (LPD). These network access methods are as follows:

- U: Print on LPDHOST using Berkeley protocol (for passing data to UNIX host spools or to the SAPLPD program at a Windows PC)
- S: Print on LPDHOST using R/3 protocol (for passing data to the SAPLPD program at a Windows PC).

The access method that you would use depends upon the type of host operating system at PSERV0.



- **Two high-volume printers**, SAPPRT03 and SAPPRT04. These printers may be line printers in a central printing shop. They are used for printing long jobs, such as lists generated by ABAP reports.

As the graphic shows, the access methods offered by the SAP spool system are suitable for passing data to these printers.

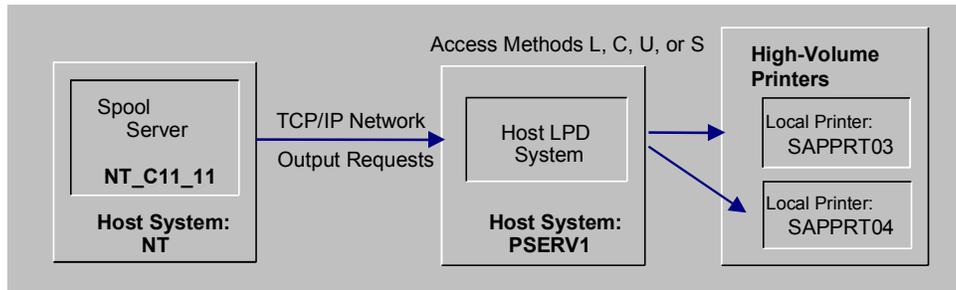
In the example, the printers are served by the R/3 spool application server NT_C11_11 on host NT. The printers are accessed, however, from another host system, PSERV1.

This configuration therefore uses one of the network access methods for passing output data from the spool server to the host spool (LPD). These network access methods are as follows:

- U: Print on LPDHOST using Berkeley protocol (for passing data to UNIX host spools or to the SAPLPD program at a Windows PC)
- S: Print on LPDHOST using R/3 protocol (for passing data to the SAPLPD program at a Windows PC)

The access method that you would use depends upon the type of host operating system at PSERV1.

Example: Setting Up Optimized Printer Configuration



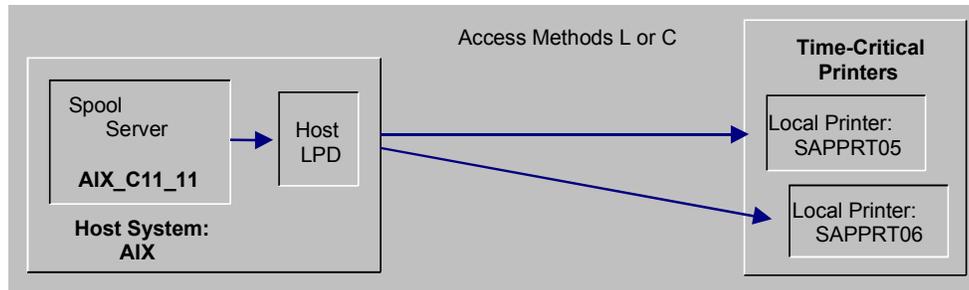
- **Two time-critical printers**, SAPPRT05 and SAPPRT06. These printers serve users who need instant access to print-outs from the SAP System. A typical time-critical printing application is labels, receipts, or other documents that are required to complete a particular business process.

As the graphic shows, only the two "local" access methods are recommended for these printers. Local access requires that the SAP spool server and the host spool that is responsible for the printers both run in the same host system.

In the example, the printers are served by the R/3 spool application server AIX_C11_11 on host AIX. The printers are driven by the spool system or host AIX. SAPPRT05 is local. That is, it is physically attached to host AIX. SAPPRT06 is connected over the network. It is accessed by the network functions offered by host AIX.

The "local" access methods offered by the SAP spool system are as follows:

- L: Print locally using LP/LPR (for local printing on a UNIX host)
- C: Direct operating system call (for local printing on a Microsoft Windows NT host)



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Example: Setting Up Optimized Printer Configuration

Connecting Output Devices to a Windows System

Which Type of Connection?

You can connect an output device (PC printer or fax machine) locally or remotely to the R/3 System. Answer the questions below to decide which procedure to use.

- **Local connection:** Is the printer accessible from a Windows NT Server on which an R/3 spool application server is running?

In this case, you can create a local connection to the printer. In each case, the Windows NT Print Manager will take care of R/3 print requests.

A local connection to the printer is usually the best as it is the fastest and most reliable type of connection.

See: [Creating a Local Connection to a Windows NT Printer \[Page 71\]](#)
- **Remote or PC connection:** Is the printer to be run by the Print Manager on a normal workplace PC or on a print server PC (no R/3 application server running on the PC)?

In this case, you can make a remote or "PC" connection to the printer.

See: [Remote or "PC" Connections to a Windows Printer \[Page 67\]](#)

For help with planning your print and fax output system, see [Planning and Implementing Your R/3 Printing Architecture \[Page 50\]](#).



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PC Connections to a Windows Printer

The standard connection to a PC printer is a remote or "PC" connection. This connection is for PCs that do not have an SAP spool application server running on them.

In a PC connection, the SAP System passes print data to the transfer program running on the PC. This program, SAPIpd, passes the data on to the Windows Print Manager for printing.

For information about how to set up a PC connection to a Windows printer, click [here \[Page 68\]](#).

See also:

[Deciding Whether to Use SWIN, the Printer-Specific Device Type, or Both \[Page 77\]](#)

[Checking SWIN's Performance \[Page 86\]](#)

[Setting Up the SAPIpd Transfer Program for Printers and Fax Machines \[Page 90\]](#)

For more information, see [Implementing PC Printing in the SAP System \[Page 55\]](#).



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Connecting a PC to a Windows Printer

Connecting a PC to a Windows Printer

Prerequisites

1. **Can you already print on the printer from your PC?** If not, install the printer on your Windows PC. You can find details about this in your Windows documentation.

You must be able to print on the printer from your PC before you can use it from the SAP System.

2. **Is the SAPIpd transfer program running on your Windows PC?** This program transfers print output from the SAP System to the Windows output controller.

For more information about SAPIpd and its options, see [Setting Up SAPIpd for Printers and Fax Devices \[Page 90\]](#).

Procedure

1. **Define the printer in the SAP System.**

Go to *Spool Administration* (transaction SPAD) and then choose *Output devices* on the *Devices / servers* tab page. Choose *Change* and then *Create* to create a new device definition. If you want to copy the definition of an output device, select an output device from the list of output devices and choose *Create with reference*.

2. **Fill out the device definition screen.**

The [graphic \[Page 70\]](#) shows an example of a remote PC connection. The following table will help you fill out the individual fields correctly.

	Field	Value
<i>DeviceAttributes</i> tab page	<i>Device type</i>	Enter the device type defined in the SAP System for your printer model. For printing under Windows, use the generic SWIN Device Type [Page 77] . This lets you use any device supported by Windows, even if the device type is not defined in R/3. For a list of the device types delivered with R/3, see SAP Note 8928.
	<i>Spool server</i>	Select the name of the SAP spool server [Page 313] to use for processing output for this device..
	<i>Authorization group</i>	To assign the output device to an authorization group, enter the name here. For more information, see Authorization Groups for Output Devices [Page 217] .
<i>HostSpoolAccMethod</i> tab page	<i>Access method</i>	Enter S for printing under Windows using the generic SWIN device type Even though access method U is also supported for PC printing, access method S provides more possibilities (such as reporting of error messages).

Connecting a PC to a Windows Printer

	<i>Host printer</i>	Enter the UNC name of the printer (name and network path) as it is defined in the Windows Print Manager. Example: \\P09330\P330 Enter <u>DEFAULT</u> (underscore underscore DEFAULT) to use the default printer in the Windows Print Manager.
	<i>Destination host</i>	Enter the network name of the Windows PC. This is the PC on which you started program SAPIpd in step 2. The name of the PC is specified under <i>Host name</i> in the SAPIpd window.

- Optional: Classify the device.** Choose *Edit* → *Classification*. Choose the output-type classification appropriate for this device.

Background: If you classify your servers as well, the spool system checks that the device and server classifications match. This helps you ensure an optimal output configuration.

Result

You can use the output device in the SAP System as soon as you have saved the device definition.



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Example: PC Connection

Example: PC Connection

The screenshot shows the 'Spool Administration: Create Output Device' dialog box. The 'Output device' field is set to 'PRINTER1' and the 'Short name' is 'PRI1'. The 'Device type' is 'Standard printer'. The 'Spool server' is 'Desktop printing' with 'ws1234' and 'ws1234_ABC_11' as options. The 'Host spool access method' is 'S: Print via SAP protocol'. The 'Host printer' is 'Wp12345P RINTER1' and the 'Host name' is 'p12345'. A printer icon is shown at the bottom left. Two yellow callout boxes provide additional information: 'The SAPlpd program runs on this host.' points to the 'Host name' field, and 'This is the name of the printer in the operating system.' points to the 'Host printer' field. A red arrow points from the 'Device type' dropdown to the printer icon.



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Local Connection to a Windows NT Printer

A printer is local when the SAP spool server can pass output requests to the Windows spool system directly without having to send the data across a network. That is, the SAP spool server is running on the Windows PC to which the printer is attached.

Prerequisite: An R/3 application server that offers the spool service must be running on the Windows NT system.

If you want to set up a **local printer** in a Windows NT system, see [Creating Local Connections to a Windows NT Printer \[Page 72\]](#).

Local printing is the fastest and most reliable way to output R/3 documents. You can also set up the NT printers using the SAPIpd transfer program and [PC Connections to a Windows Printer \[Page 67\]](#). You can do this even if the spool server for the printer is running on the NT system.

See also:

[Access Method "L" for Local Printing on Windows-NT-System \[Page 75\]](#)

For more information, see [Implementing Local Printing in the SAP System \[Page 59\]](#).



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Creating Local Connections to Windows NT Printers

Creating Local Connections to Windows NT Printers

Prerequisites

1. **Can you already print on the printer from your PC?** If not, then you must install the printer on your Windows NT PC. You can find information about this in your Windows NT documentation.

You must be able to print on the printer from your PC before you can print to it from the SAP System.

2. **Make sure that the prerequisites are satisfied.** To set up a local printer for a Windows NT PC, you will need to do the following:
 - Ensure that an SAP spool server is running on the NT PC.

A local connection to a Windows printer is possible only using Windows NT.

A spool server is an R/3 server that has a spool work process and therefore offers the spool service. The list of [SAP Servers \[Ext.\]](#) shows you which servers in your system are spool servers.

Note that shared (network) printers that you access from the Windows NT PC are considered local for purposes of R/3 printing. Example: An SAP spool server is running on an NT PC. You can define any printer the NT PC accesses as a local printer, regardless of whether the printer is directly attached to the PC or not.

Procedure

1. **Define the printer in the SAP System.** Go to *Spool Administration* (transaction SPAD) and choose *Output devices* on the *Devices / servers* tab page. Then choose *Create* to create a new device definition. If you want to copy the definition of an output device, select it in the list of output devices and choose *Create using template*.
2. **Fill out the definition screen.**

The [graphic \[Page 74\]](#) displays an example of a local Windows NT connection. The following table helps you to fill out the individual fields correctly.

	Field	Value
<i>DeviceAttributes</i> tab page	<i>Device type</i>	<p>Enter the device type defined in the SAP System for your printer model.</p> <p>For printer under Windows, you can also use the generic SWIN Device Type [Page 77]. Use this type to print to any device supported by windows, even the device type itself is not defined in the SAP System.</p> <p>For a list of device types delivered, see SAP Note 8928.</p>

Creating Local Connections to Windows NT Printers

	<i>Spool server</i>	Enter the name of the SAP spool server running on the Windows NT system. For a local connection, the SAP spool server and the Windows NT Print Manager must be running on the same system. For more information, see Spool Server [Page 313]
	<i>Authorization-group</i>	To assign the output device to an authorization group, enter the name here. For more information, see Authorization Groups for Output Devices [Page 217] .
	<i>Host spool access method</i>	Enter C , for local printing by way of the Windows NT print application interface. This is the recommended access method. Or, enter L for LPD-style local printing. For more information, see Access Method "L" for Local Printing at Windows NT [Page 75] .
	<i>Host printer</i>	Enter the UNC name of the printer (name and network path) as defined in the Windows Print Manager. Example: \\P09330\P330

3. Optional: Classify the device.

Choose *Edit* → *Classification*. Choose the output type classification appropriate for this device.

Background: If you classify your servers as well, the spool system checks that the device and server classifications match. This helps you enforce an optimal output configuration.

Result

You can use the printer in the SAP System as soon as you save your new device definitions.



Status information about output requests is not available from Windows NT systems if you use access method C.



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Example: Local Connection

Example: Local Connection

The screenshot shows the 'Spool Administration: Create Output Device' dialog box. The 'Output device' field is set to 'PRINTER2' and the 'Short name' is 'PRI2'. The 'Device type' is 'POST2: PS lv.2ISO Latin1 R4.5A+ ONLY!'. The 'Spool server' is 'Production printing' on host 'nt5678' with spool server 'nt5678_ABC_11'. The 'Device class' is 'Standard printer'. The 'Host spool access method' is 'C: Direct operating system call'. The 'Host printer' is 'PRINTER2' and the 'Destination host' is 'nt5678'. The printer model is 'KALAHARI 333' and the location is 'Printer room 99'. A printer image is shown at the bottom left. Two yellow callout boxes provide context: one points to the 'Host printer' field with the text 'The printer is connected to this NT server. A spool service runs on this server.' and another points to the 'Host printer' field with the text 'This is the name of the printer in the operating system.'



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Access Method "L" for Local Printing in Windows NT Systems

Use this access method to use output management systems; these are started using a print command.

Access method L implements command-driven output on Windows NT. That is, a file containing the output data is downloaded to the Windows NT file system. The SAP System then issues a print command to have the file printed. The print command to use is recorded in a system profile parameter, `rspo/host_spool/print`.

Output method C, by contrast, uses the NT programming interface to pass output data directly to the Print Manager. Unless you have an output management system, you should use access method C.

The Print Command

SAP provides a predefined print command for access method L. You will probably need to change this command to work with the output management system that you intend to use.

The default print command simply calls MS-DOS print. The command as issued by the SAP System is:

```
print /d:&P &F where:
```

- `/d:` is the printer port option.
- `&P` is the name of the port to which the printer is attached in the Windows NT system. Examples: LPT1:, COM1.
- `&F` is the name of the file that is to be printed.

You can have the SAP System issue a different print command by entering the command in the system profile parameter `rspo/host_spool/print` or by defining a command set (*Edit* → *Command set* in the device definition) for the device.

You can also define a special command set for use with your Windows NT printers. A command set lets you specify print and query commands that differ from the default commands.

To define a command set, proceed as follows in the definition of the output device:

1. Choose *Edit* → *Command set*.
2. If you have already defined an acceptable command set, then enter the identification letter of the set in the *Command record ID* field on the *HostSpoolAccMethod* tab page.
3. If you want to define a new command set, then enter a letter to name the set in the *Command record ID* field.

Double-click on the field. In the subsequent dialog window, you can enter the commands that are to be used with this device. The command set is also usable in other access method L device definitions.

Status of print requests for host spool access method L

You can only query the status of print requests from output controller system in the host system for access method L in Windows NT systems if the following is true:

Access Method "L" for Local Printing in Windows NT Systems

1. The print command reports a job number in the UNIX format lpq/lpstat
2. The query command reports a status message in the UNIX format lpq/lpstat or the Siemens-Nixdorf xpstat.

If the output controller used does not fulfill these prerequisites, you must select the *Do not query host spool for output status* field in the R/3 output device definition.

If the output controller does fulfill these prerequisites, you can enter the query command to use in the SAP System profile. Enter the command in the parameter `rspo/host_spool/query` and the format of the status message in the parameter `rspo/host_spool/answer_format`.

Set these parameters in the profile of the application server in the Windows NT system.



For more information, see SAP Note 161516.



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Which Device Type: SWIN, Printer-Specific or Both?

Which Device Type: SWIN, Printer-Specific or Both?

When you add a Windows printer, you can specify either a printer-specific device type (example: HPLJIIID, KYOF1212) or the generic Windows device type, SWIN.

You can specify SWIN as the device type for all printers for which a driver is installed in the Windows system).

With SWIN, you can also use Windows printer support to access an output device even if the device type is not supported by the SAP System (that is, no print controls, formats or device-type formats have been specified for the device type).



Your SAP System does not contain the definition for your Kalahari 1202 laser printer. However, you have installed the printer under Windows and you have no problems printing to it. This means you will not have to create a full printer definition in the SAP spool system for the Kalahari 1202. Instead, you only have to define the printer as a SWIN device in the *Output device* definition. After creating the definition, you can print from the SAP System to the Kalahari 1202 without any other preparations.

SWIN also offers some functions (such as color printer support) that are not available for all printer-specific device types.

You may want to define two definitions for a printer, one with SWIN as the device type, the other with the printer-specific device type. In that way, you can take advantage of the features of both device types. You can then select the device type according to the printing features you require.

[When to Use SWIN \[Page 78\]](#)

[Restrictions on SWIN Output \[Page 79\]](#)

See also:

[Modifying the SWIN \(SAPWIN\) Device Type \[Page 293\]](#)



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When to Use SWIN

When to Use SWIN

You should use SWIN as the type for a fax or printer at a Windows system if any of the following are true:

- The SWIN restrictions (see [Restrictions on SWIN Output \[Page 79\]](#)) are acceptable and you want to take advantage of the special features and simplified printer set-up and maintenance that SWIN offers.

You can use SWIN to print on a printer whose device type was not defined in the SAP spool system, but for which you have Windows drivers.

- You want to print R/3 list output on a color printer. SWIN replicates the predefined R/3 list color schemes on any color printer supported by Windows.

From Release 4.5A, color printing is supported by SWIN as well as by device types HPLJ4000, KYOFS170 and POST2. Other device types cannot send color output to printers.

- You want to print R/3 list output in halftone (gray scale, with gray background shading).

From Release 4.5A, SWIN and device types HPLJ4000, KYOFS170 and POST2 offer halftone conversion of R/3 list colors. Other device types cannot convert list colors to halftone.

- You are having trouble getting a Windows printer to work correctly with its printer-specific R/3 device type (such as HPLJIIID).

If the printer is a shared network printer and if you encounter network or other problems using the printer with the printer-specific R/3 device type, then using SWIN is likely to resolve the problem. SWIN uses the Windows API for printing. Using the Windows API leaves the work of communicating with the printer to Windows.

Printing with a printer-specific device type makes use of the network functions OpenSpool, WriteSpool, and CloseSpool. Not all network packages offer correctly functioning support for these functions.

- You want to send faxes from the SAP System using a Windows fax program and a fax machine that is attached to a Windows system.

You must use SWIN as the device type for faxing with WinFax PRO from Delrina or other supported products.



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Restrictions on SWIN Output

You can print or fax any type of R/3 output (lists and SAP forms) on a SWIN printer or fax machine. However, the following restrictions apply:

- Output using the device type SWIN usually takes longer than printing using a printer-specific device type, as the output is processed by the Windows printer driver.
- Bar code printing is possible only if an appropriate dynamically linked bar code library (.DLL) file is available in the Microsoft Windows system. This restriction applies even if the printer has a bar code cartridge, because Microsoft Windows cannot pass the required print commands to the printer.
- SWIN cannot print all of the graphical objects used by the SAP System.

It can print R/3 symbols (the SAPDings font). Likewise, SAPIpd can print TIFF and Windows/OS2.BMP bitmap graphics that have been uploaded into SAP forms. TIFF graphics are converted into Windows.BMP bitmaps for printing.

It cannot print the following:

- PostScript, Prescribe, or PCL-5 printer macros that have been uploaded into *SAPscript*. To print these macros, you must use the printer-specific device type.
- R/3 presentation graphics. These graphics require that the printer be defined with one of the graphics drivers delivered with the SAP System.



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Optimizing SWIN Output

Optimizing SWIN Output

SWIN and the SAPIpd program offer [Options \[Page 81\]](#) with which you can optimize printing speed and quality:

- To improve print quality, you can activate:
 - Color or halftone printing
 - Printing of lines and boxes as graphics in R/3 output
 - Background shading in list output

You should activate all of these options for normal SWIN printing.

- To speed up printing from your SWIN printer, you can do the following:
 - Deactivate color and halftone printing
 - Print lines and boxes as replacement characters or do not print them at all
 - Deactivate background shading
 - Force portrait-mode printing



Downloading of graphics is another important factor in SAPIpd and PC print performance. In *SAPscript*, you can incorporate bitmap graphics and printer macros in forms (for form printing). Downloading and processing these graphics takes extra time. If you set all SAPIpd options for speed and still have performance problems, check for graphics in your *SAPscript* print requests. You may need to eliminate these as well, or substitute smaller graphics for company logos and so on.

For information about optimizing SWIN output for speed or print quality, see [SAPIpd Options \[Page 81\]](#).



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SAPlpd Options

Use the following options to optimize the speed and appearance of the SWIN output:

Function	Option
Activate color printing	In the SAPlpd program, choose <i>Options</i> → <i>Color</i> . Select <i>Use color</i> . Color output is printed in color on color printers. Note: Color background shading is only printed if you also activate <i>Print backgrounds</i> for colors.
Activate halftone printing	Two alternatives: <ul style="list-style-type: none"> In the SAPlpd program, choose <i>Options</i> → <i>Color</i>. Select <i>Use halftones</i>. Color or halftone output is printed using standard Windows halftone patterns. In the SAPlpd program, choose <i>Options</i> → <i>Color</i>. Select <i>Use color</i>. On black and white printers, color or halftone output is printed using a different algorithm than with the <i>Use halftones</i> option. In general, this option produces darker halftones with finer textures than <i>Use halftones</i>. Output often looks better. Use this option if you want to print halftone background shading as well as halftone characters. Note: Halftone background shading is only printed if you also activate <i>Print backgrounds</i> for color and halftone printing.
Deactivate color and halftone printing to increase printing speed.	In the SAPlpd transfer program, choose <i>Options</i> → <i>Printer</i> → <i>Colors</i> . Select <i>No specification</i> . Output is printed in black/white mode. Deactivate printing of background shading separately.
Activate or deactivate printing of background shading.	Activate: In the SAPlpd transfer program, choose <i>Options</i> → <i>Background</i> . Select <i>Print background</i> for color and halftone printing. Depending upon whether you have a color printer and upon the <i>Colors</i> settings, background shadings may be printed in color or halftone. You must activate background shading and color printing if you want to print bar charts (such as those generated by the ABAP runtime analysis) or lists that use light background colors. Deactivate: In the SAPlpd transfer program, choose <i>Options</i> → <i>Background</i> . Make sure both options are not selected.

SAPlpd Options

Print lines and frames as graphics	<p>In the SAPlpd transfer program, choose <i>Options</i> → <i>Graphics</i>. Select <i>Print as graphic</i>.</p> <p>Frames and lines in R/3 reports and texts, such as address boxes in mail messages, are printed as graphics.</p> <p>If frames and lines do not print correctly as graphics, then try the <i>Do not print</i> option. This may produce the best-looking output, especially if the other options to improve appearance are selected.</p>
Set line and frame printing to improve speed.	<p>In the SAPlpd transfer program, choose <i>Options</i> → <i>Graphics</i>. Select either <i>Print substitute characters</i> or <i>Do not print</i>.</p> <p><i>Print substitute characters</i> prints out frames and lines using the - and + characters.</p> <p><i>Do not print</i> means frames and lines are not printed.</p>
Force portrait-mode printing to improve speed.	<p>In the SAPlpd transfer program, choose <i>Options</i> → <i>Only portrait</i>.</p> <p>Forces printing from the SAP System to use portrait page orientation only. Portrait mode is used even if the output stream from the SAP System specifies landscape mode. This is useful if your Windows printer driver is slow when printing SWIN output in landscape mode.</p> <p>Forcing portrait mode is also useful if you are using wide continuous-feed forms in your printer.</p> <p>Caution: Wide list output that does not fit on a portrait-oriented page is cut off on the right side if you force portrait mode.</p>



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Substituting Fonts in SWIN Output

The SWIN device type converts output text to the character representations in R/3 character set 1134. This character set specifies the code to send to the Windows Print Manager to have each character printed out.

Default font: The default font for all SWIN output (SAPscript or list output) is "Courier New". This specification causes the Windows system to use the Microsoft Courier New TrueType font for the output.

All list output from SWIN uses only "Courier New". This means that specifying the font substitution "Courier New" to "Symbols" changes all list output from Courier New to Symbols.

SAPscript can switch to other fonts that are installed in the target Windows PC. For example, the standard SWIN print control SF101 switches to Arial. You therefore cannot be sure that all SAPscript output arrives at the PC as "Courier New" text.

Font substitution: With the SAPIpd *Font substitution* option, you can substitute another Windows font for the Windows font specified in SWIN output. Enter only Windows fonts in the *Font substitution* fields. You can specify only typefaces that have been installed in Windows. Printer typefaces that have not been installed under Windows are not available.

Example: You can have all output that arrives at SAPIpd in "Courier New" converted to "IBMPCDOS", if that font is installed in your Windows system.

You can also enter multiple font substitutions. Each time a font is called for in an R/3 print request, the substitute font that you have specified is used instead.



You should not substitute a proportional font such as Times-Roman for a fixed-width font such as Courier.

Output will be printed using the proportional font, but the character spacing will be incorrect. This is because the SAP spool system sets the text using the fixed-width character pitch of the non-proportional font. The fixed-width character spacing causes characters in proportional fonts to be incorrectly spaced.



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Setting the Character Set for SWIN and SAPIpd

Setting the Character Set for SWIN and SAPIpd

You can specify the Windows font set that is to be used for SWIN print output. This specification applies to all printers that are defined with the SWIN device type in the SAP spool system.

You need to make this specification only if you have special printing requirements:

- You want to use a double-byte character set. Example: you want to print Japanese Kanji characters.
- You want to use an OEM character set that you have installed in your Windows PC.

The font specification applies to all SWIN output and cannot be dynamically changed. The specification applies only to SWIN printers; R/3 print requests for printers that are defined with other device types are not affected.

Under Windows, specifying a font implicitly selects a character set. For example, specifying a SHIFTJIS_CHARSET selects a font and, by necessity, the double-byte character set that is associated with it.



You can specify that all output from SWIN printers is to be printed on fonts selected from the SHIFTJIS_CHARSET double-byte character set (for Kanji).

Procedure

To set the character set, first install SAPIpd. Then do the following:

1. Edit the WIN.INI file in the windows, winnt or win95 directory.
2. Search for section SAPIpd. Add the section if it is not already present.
3. Add or edit the WinCharSet option. The following values are permitted:

0	ANSI_CHARSET (the default value)
1	No character set specification. The character set defaults to that associated with Courier or with a substitution font that you specify in <i>Font substitution</i>
2	SYMBOL_CHARSET
7 7	MAC_CHARSET
128	SHIFTJIS_CHARSET (double-byte character set for printing Japanese <i>Kanji</i> and <i>Kana</i> characters)
129	HANGEUL_CHARSET (double-byte character set for printing Korean <i>Hangul</i> characters)
130	JOHAB_CHARSET
134	GB2312_CHARSET (double-byte character set for printing simplified Chinese characters)
136	CHINESEBIG5_CHARSET (double-byte character set for printing traditional Chinese characters)
161	GREEK_CHARSET

Setting the Character Set for SWIN and SAPIpd

162	TURKISH_CHARSET
177	HEBREW_CHARSET
178	ARABIC_CHARSET
186	BALTIC_CHARSET
204	RUSSIAN_CHARSET
222	THAI_CHARSET
255	OEM_CHARSET (an OEM character set that you have installed in your Windows PC)

ANSI_CHARSET, SYMBOL_CHARSET, and the other capitalized names in this list are the names of Windows programming constants. These are documented in Microsoft documentation on the CreateFont statement of the Windows application interface. SAPIpd triggers Windows font selections by using these values in WinCharSet.



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Checking SWIN's Performance

Checking SWIN's Performance

SWIN is the generic R/3 device type for Windows printers. SWIN print requests may print more slowly on a PC than print requests that use another R/3 device type, such as POSTSCPT or HPLJ4.

Windows takes over the print formatting when you use SWIN. With printer-specific device types, the SAP System does the formatting. Further, the S access method, which you should choose when using SWIN, transmits output data in blocks. In slow WAN connections and overburdened networks, this block transmission can be slower than file transmission with access method U

Usually, the difference in performance is slight. If, however, you find that printing is too slow, then you can switch to one of the printer-specific output device types, such as POSTSCPT, for PostScript printers.

For more information, see *Device type* in [Making a Remote or PC Connection to a Windows Printer \[Page 67\]](#).

Procedure

1. Find the *SAPlpd* window on the PC in question.
2. Choose *Test helps* → *Settings* in the *SAPlpd* menu. Set the value in the *SAPlpd* box to 1.

This switches on the first level of tracing in *SAPlpd*.

3. Send some test print requests to the PC printer that is printing too slowly.
4. As the jobs arrive and are processed, look for the following message at the end of each request:

Elapsed time <seconds> sec. (<seconds> sec. used by Windows)

The first figure is the total processing time for the print request.

The second figure is the amount of time that Windows spent formatting the print request. Usually, this value is very small. However, in a few combinations of Windows driver and printer, the processing time can be many seconds for a typical small print request.

If the Windows processing time is too long, then you should try switching to the printer-specific R/3 device type for this printer. Change the device type in the R/3 definition of the printer: [Making a Remote or "PC" Connection to a Windows Printer \[Page 67\]](#).

5. Remember to reset the *Test helps* → *Settings* value for *SAPlpd* back to 0. This turns tracing back off again.



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Connecting Fax Devices

This topic explains how to set up and use a fax device connected to a Windows or Windows NT PC.

Fax Software Compatibility

Currently, Delrina WinFax PRO versions 3.0, 4.0, and 7.0 are known to be compatible with SAPIpd. WinFax PRO supports automatic transfer of the destination phone number. That is, a destination fax number entered in the SAP System is automatically passed to the WinFax PRO software.

All other fax software packages that run as drivers under Windows should be able to send faxes from the SAP System. WinFax is the only product that currently supports automatic transfer of the destination fax number. If you use another fax software package, test the fax software to be sure that it prompts for a fax number at the Windows PC when an R/3 fax is sent. You must also establish a procedure for entering the required fax number at the Windows PC.

If you want to enter the fax number manually at the PC, add the following to the SAPIpd section of the win.ini file on the Windows PC:

AbortOnManualDial=0

This parameter is set to 1 by default. This setting causes any fax request to be canceled if the destination fax number cannot be transmitted automatically to the fax software by way of SAPFAX.DLL.



SAP Note 44062 provides information about how to use Windows fax packages other than WinFax PRO.

Procedure

To set up a fax device, do the following:

1. Can you already fax from your Windows PC? If not, then you must first install the fax device and fax software on the Windows, Windows for Workgroups, or Windows NT PC. You must be able to fax successfully from Windows before you can send faxes from the SAP System.
2. Set up SAPIpd on the Windows PC where the fax device is attached.

For more information about this step, see [Setting Up the SAPIpd Transfer Program for Printers and Fax Devices \[Page 90\]](#).

In addition to the SAPIpd executable you also need the SAPFAX.DLL that creates the interface between the SAPIpd transfer program and the Windows fax software. SAPFAX is installed with your SAP GUI frontend software, just as SAPIpd is. SAPFAX.DLL should be in the same directory as SAPIpd.EXE and must remain there.

3. Define the fax device in the SAP spool system. Defining the fax in the SAP spool system makes it available for faxing from within the SAP System.

Call the *Spool Administration* transaction (SPAD) and then choose *Output devices* on the *Devices / servers* tab page. Then choose *Create* to create a new device definition.

Connecting Fax Devices

4. Specify the following in the *Output device* definition:

	Field	What to enter
DeviceAttributes tab page	<i>Output device</i>	Enter a name for the fax device. R/3 users use this name to access the device. The name can have up to 30 characters and is case-sensitive.
	<i>Device type</i>	Choose SWIN . SWIN is required for fax devices connected to Windows PCs.
	<i>Spool server</i>	Enter the name of the spool server. This is the spool server that formats the output for the device.
	<i>Authorization group</i>	If you want to assign the fax device to an authorization group, enter the name of the group here. For more information see Authorization Groups for Output Devices [Page 217]
HostSpoolAccMethod tab page	<i>Host spool access method</i>	Enter S (for SWIN). The SWIN protocol is required to send data to Windows fax devices.
	<i>Host printer</i>	Enter the name of the fax device in the Windows system. Example: If the name is \\pn122\fax1, enter fax1 in the R/3 <i>Output device</i> definition.
	<i>Destination host</i>	Enter the network name of the Windows PC. This is the PC where the SAPIpd transfer program is started from. The name of the PC is displayed in the SAPIpd window under <i>Server name</i> .

5. Start the fax software and SAPIpd on the Windows PC. You should now be able to send faxes from the SAP System using the fax device.

Be sure to start the fax software before starting SAPIpd or the SAP GUI frontend software. In some cases, the fax software may not respond correctly if SAPIpd or SAP GUI are started first.



You can only send faxes under Windows. Faxes that are received at your Windows PC are not automatically transmitted to the SAP System. Instead, you must manually transfer these faxes from your Windows PC.

Sending Faxes: Entering the Destination Fax Number

Users can fax any type of R/3 text. A user can enter the destination fax number either:

- When sending a spool request to the fax machine from the spool output controller (transaction SP01).

The user will need to leave the *Print immediately* option blank when printing the fax, so that the spool request is held in the spool system. When printing from the output controller, users can then enter the destination fax number.

- When faxing an SAPscript document.

If no fax number is supplied with a fax output request, WinFax PRO displays a dialog box at the Windows PC requesting the number.



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SAPlpd for Printers and Fax Devices

SAPlpd for Printers and Fax Devices

To reach the spool system and printers on a remote Windows system, the SAP spool system must work with a process that runs externally to the SAP System. This process is the R/3 transfer (or SAPlpd) program.

This section explains how to set up the SAPlpd program on a Windows PC. For an explanation of how SAPlpd works on your network, see [Implementing R/3 PC Printing \[Page 55\]](#).



SAPlpd.EXE and associated files may be updated between R/3 Releases. You can obtain the newest version from the SAPNet servers (SAPSERV4 for the USA, for example) by FTP from directory /general/frontend/saplpd. You can find out about the newest features of SAPlpd by choosing *Help* → *Display README-file* in SAPlpd.



You can also use the TCP/IP print server under Windows NT instead of SAPlpd, but only for access method U and not for device type SWIN.



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When Should I Use SAPIpd?

SAPIpd is required for printing in the following cases:

- When you want to use printers or fax machines from the Print Manager at any Windows PC
- When you want to use printers or fax machines from the Print Manager at a Windows NT PC **and** no R/3 application server is running on the NT PC.

If an application server is running on the NT PC, then you can set up a spool work process at the server. You can then pass print requests directly to the PC from the application server. The SAPIpd transfer process is not needed unless you have defined the printers/fax machines with device type SWIN. For more information, see [Deciding Whether to Use SWIN, the Printer-Specific Device Type, or Both \[Page 77\]](#).



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Installation of SAPIpd

Installation of SAPIpd

Prerequisites

Current technical specifications are available from SAP or in the SLPDREAD.TXT file in the SAP GUI/SAPIpd program directory. However, SAPIpd has the following basic requirements:

- Microsoft Windows 3.1, Windows for Workgroups 3.11, Windows95 or Windows NT
- Any implementation of the TCP/IP network protocol that supports Windows Sockets (the Winsock interface), such as Microsoft LanManager.

Contact SAP to find out which software packages are supported.

- For faxing, the R/3 SAPFAX.DLL file and the currently supported fax software package, WinFax PRO versions 3.0, 4.0, and 7.0 (Delrina).



For information about using other fax software packages, see SAP Note 44062.

SAPFAX.DLL is installed automatically when you install R/3's SAP GUI frontend software and the SAPIpd program.

Installing SAPIpd

To install the SAPIpd transmission program, you must also install the R/3 SAP GUI frontend software. The SAP GUI installation package contains the SAPIpd program, as well as the files SLPDREAD.TXT, SLPD.MSG (initializes SAPIpd in the language to be used for the program display), SLPDBITM.TXT (contains codes for printing symbols), LPRINT.EXE (RFC server for frontend printing) and SAPFAX.DLL (required for faxing). The presentation language for SAPIpd is specified in the win.ini file. You can also change the language in SAPIpd. The default language is English.

The SAP GUI installation documentation contains detailed information about how to install SAP GUI and SAPIpd. Once you have installed SAP GUI and SAPIpd, more information is provided in the SLPDREAD.TXT file located in the SAP GUI / SAPIpd directory.

Choosing the correct SAPIpd version

A 16-bit version of SAPIpd is delivered for Windows 3.1, and a 32-bit version is delivered for Windows 95 and Windows NT. The 16-bit version of SAPIpd is delivered with the 16-bit version of the SAP GUI frontend software; the 32-bit version is delivered with the 32-bit SAP GUI. SAPLPD.EXE is the executable in both versions.

Choose a version as follows:

- Under Windows NT and Windows 95, start the 32-bit version.
- Under other Windows systems, start the 16-bit version of SAPIpd. Only the 16-bit version can run on these systems.

Use the 16-bit version for all network programs that support the 16-bit version of the Winsock interface, including the Winsock version of Microsoft LanManager.



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Starting SAPIpd

Starting SAPIpd

To start SAPIpd, you can either click on the icon in the SAP GUI window or copy the program icon to the *Startup* window, so that the program is started automatically when you start Windows.

You can start a shared version of the program over the network instead of installing the program locally on each of your PCs. If you do so, make sure that SAPIpd has a local, writable working directory on the PC. You can specify the location of the working directory in the Windows program properties for SAPIpd.

You need to start only a single instance of SAPIpd on a Windows PC. This instance of SAPIpd can accept output from any of your SAP Systems, should the Windows printers be defined in more than one system. For example, you can use a single SAPIpd to accept print or fax output from both your production and test SAP Systems.



If you are using SAPIpd to send faxes from your Windows PC, then you may need to start the fax software before you start SAPIpd. SAP has noted that certain fax software packages run correctly only if they are started before SAPIpd.

SAP recommends testing your fax software with SAPIpd to ensure that faxes from the SAP System are correctly received and faxed. If you have problems, then ensure that the fax software is started first.

If you are starting SAPIpd automatically from the start-up window, then move the fax software icon to the first position in Startup window. This ensures that the fax program is started first. You may, however, need to remove SAPIpd from the start-up window and start it by hand if the fax program does not initialize itself quickly enough before SAPIpd is automatically started.



You can also operate SAPIpd as a service under Windows NT. SAPIpd then also runs on your PC if no user is logged on. For further information about this, see SAP Note 42268.



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SAPlpd Work Directory and Work Files

Work Directory

SAPlpd can be installed on each Microsoft Windows system to be used for printing. You can also start SAPlpd on each Windows system from a central shared copy of the executable. In each case, SAPlpd must change (cd) to a writable working directory when it is started. It uses this directory for temporary storage of print requests. You can specify this working directory in the *Properties* you specify for SAPlpd in the Microsoft NT Explorer.

For performance reasons this working directory should be local, on the system on which SAPlpd is running.

Work Files

SAPlpd temporarily stores all incoming output requests as files in the working directory of the program.

The SAPlpd working files are automatically deleted when a print request is passed off to the Windows print controller. Should a print request be received but never printed, the file remains in storage. After any sort of printer failure, you should therefore check your working directory for the following files:

- For access method U: dfA* files
- For access method S: <number combination >_<number combination>

You should either print or delete these files. If you want to print the files, call SAPlpd from the command line, as in this example:

```
SAPlpd -f dfA136c1.1xx -p p330
```



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Using SAPIpd Menu Functions

Using SAPIpd Menu Functions

The menus offered in the SAPIpd program interface allow you to control the following SAPIpd functions:

SAPIpd Menu Functions

Menu and Function	Purpose
<i>File</i> → <i>Save as</i>	Lets you save the current SAPIpd activity log as a file. The activity log is the information that SAPIpd writes on its program window as it receives print jobs.
<i>Log</i> → <i>Delete</i>	Erases the current SAPIpd activity log from the program window.
<i>Options</i>	Lets you customize the appearance of certain R/3 print requests. The customizing options work only on requests for devices that are defined with device type SWIN in the SAP spool System. For more information, see Making Use of Special Features of SWIN Printing.
<i>Debug</i>	You can use <i>SAPIpd</i> to monitor when output requests are being processed, and <i>Network</i> to monitor network communication. Normally, you can leave the default values <i>Debug level 0</i> , <i>Trace level 1</i> set. SAPIpd logs only the arrival and end of processing of print requests. You can set values up to 9 for the <i>SAPIpd</i> option, or 3 for <i>Network</i> , to track SAPIpd's activity. All debug and trace messages (those that have to do with the reception and processing of jobs) are displayed right in the SAPIpd window. You can save these debugs and traces by saving the window in SAPIpd. You can also use the start options -d or -g. See SAP Note 41913. It is best to leave the default settings in place unless technical support requests trace information from you.
<i>Language</i>	Select the language for SAPIpd menus and messages.



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Searching for Remote Printers

As of version 2.42, SAPIpd can search for shared (network) printers that are not defined in the Print Manager of the PC in which SAPIpd is running.

By default, this function is de-activated (parameter value 0). If *Host printer* in the R/3 output device definition specifies an unknown printer, then SAPIpd returns an error message.

If you activate the function, then SAPIpd searches your network for unknown printers. That is, if a print request for a printer that is not defined in the Print Manager arrives, then SAPIpd looks for it in your network. If it finds the printer, then it can send the print job to it.



Generating a list of remote printers takes time. Using this function to print on non-defined printers will slow down print request processing.

To activate the function, enter the following in the SAPIpd section in the win.ini of the SAPIpd PC:

```
EnableRemotePrinters=1
```



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Connecting UNIX Printers to the SAP System

Connecting UNIX Printers to the SAP System

To use a UNIX output device from the SAP System, you must first inform the SAP System of its name and type. To do this, call *Spool Administration* (transaction SPAD). Then select *Output devices* on the *Devices / servers* tab page. Choose *Create* to create a new device definition. If you want to copy the configuration of an existing output device, choose *Create with reference*.

Procedure

1. **Fill out the definition screen.** The [graphic \[Page 101\]](#) shows a completed definition. The following table will help you fill out the individual fields correctly.

	Field	Value
<i>DeviceAttributes</i> tab page	<i>Device type</i>	Enter the device type defined in the SAP System for your printer model. Examples: HPLJ4 for Hewlett-Packard LaserJet 4 printers, POSTSCPT for any PostScript printer. You cannot specify the generic SWIN device type.
	<i>Spool server</i>	Select the R/3 application server [Page 313] to use as the spool server. The spool work process responsible for the output device runs on the spool server. If possible, you should choose a spool server running on the host system the output device is attached to (<i>Access method L</i>). This means the SAP spool server can pass output requests directly to the host spool in the same system. This configuration is the most reliable way of connecting a UNIX output device. If the target host system has a compatible LPD configuration, the spool work process can also send output data through a network connection (access method U). (This pertains to all UNIX systems except OSF/1. OSF/1 requires that spool requests come from the "root" user, but the SAP System does not run as the "root").
	<i>Authorization group</i>	To assign the output device to an authorization group, enter the name here. For more information, see Authorization Groups for Output Devices [Page 217] .

Connecting UNIX Printers to the SAP System

<p><i>HostSpoolAcc Method tab page</i></p>	<p><i>Access method</i></p>	<p>Specify how the spool work process or formatting program is to pass data to the host spool. "Local" output device: If you are using a spool work process and the printer is local – served by the spool of the host that you entered in <i>Host name</i> – choose access method L. The output device can be physically or remotely attached to the host. Regardless of where it is located, the output device is "local" with respect to the SAP System if it is served by the spool system of the host you specified under <i>Host name</i>. "Remote" Output Device [Page 102]: If the output device is attached to a different host system than you entered in <i>Host name</i>, then enter access method U. If you enter access method U, the system displays an additional host system field. Enter the name of the host system to which the output data is to be sent. This is the name of the host system to which the printer is attached (locally or remotely).</p> <p style="text-align: center;"></p> <p style="text-align: center;">Output requests can only be sent to a remote output device using access method U if the remote host system is either a Hewlett-Packard HP-UX or an IBM AIX system.</p>
	<p><i>Host printer</i></p>	<p>Enter the name of the output device as it is specified in the UNIX system. Pay attention to capitalization.</p>

2. Optional: Classify the device.

Choose *Edit* → *Classification*. Choose the output-type classification appropriate for this device.

Background: If you classify your servers as well, the spool system checks that the device and server classifications match. This helps to ensure an optimal output configuration.

3. Optional: Define or select a command set for this device (local printers, access method L only).

If this device requires print and query commands that differ from the default commands, you can specify a command set for use with this device.

To do so, do the following:

Choose *Edit* → *Command set*.

If you have already defined an acceptable command set, then enter the identification letter of the set in the *Command record ID* field.

If you want to define a new command set, then enter a letter to name the set in the *Command record ID* field.

Double-click the field. In the next dialog box, enter the commands that are to be used with this device. The command set can also be used in other access method L device definitions.

Connecting UNIX Printers to the SAP System

4. Save the device definition.

Result

You can now use the output device in your SAP System.



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Example: Local UNIX Printer

Here is a sample definition for a device that the R/3 spool server accesses by way of a local host (access method L).

The screenshot shows the 'Spool Administration: Create Output Device' dialog box. The 'Output device' field is set to 'PRINTER3' and the 'Short name' is 'PRI3'. The 'Device type' is 'ASCIIPRI: Some generic ASCII printer'. The 'Spool server' is 'ws1234' and the 'Server for high-volume printing' is 'ws1234_ABC_11'. The 'Device class' is 'Standard printer'. The 'Authorization group' is empty. The 'Model' is 'KALAHARI line pr.', 'Location' is 'Printer room 99', and 'Message' is empty. The 'Host spool access method' is 'L: Print locally via LP/LPR'. The 'Host printer' is 'PRINTER3' and the 'Destination host' is 'ws1234'. A printer icon is shown at the bottom left. Two yellow callout boxes provide additional information: 'The printer is connected to this NT server. A spool service runs on this server.' and 'This is the name of the printer in the operating system.'



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Example: Remote UNIX Printer

Example: Remote UNIX Printer

Here is a sample definition for a device that the SAP spool server accesses by way of a remote host (access method U)

Spool Administration: Create Output Device

Output device: PRINTER4 Short name: PRI4

Device type: [POST2: PS lv.2 ISO Latin1 R4.5A+ONLY!]
Spool server: Desktop printing ws1234 ws1234_ABC_11
Server for desktop printing

Device class: Standard printer
Authorization group:
Model: KALAHARI 999
Location: Building ABC, Room 123
Message:
Host spool access method: U: Print via Berkeley protocol
Host printer: PRINTER1
Destination host: ws5678

A UNIX lpd runs on this UNIX host.

This is the name of the printer in the operating system.



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R/3 Print Files: Location and Naming Convention

The print files created by a formatting program are stored in the R/3 data directory. The path name of the data directory is specified in the system profile parameter DIR_DATA. By default, this is the instance data directory, /usr/sap/C11/<Instance name>/data in UNIX systems.

With the rspo/to_host/data_file system profile parameter, you can specify a standard name for the print files generated by a formatting program. In all cases, you should include a string of seven + signs in the name. For the + signs, the spool system substitutes a unique seven-character string, which is generated by the formatting program according to the convention shown below.

Print File Identifier

Character position	Meaning
1	Additional character for specifying the number of the output request. Initially set to "P" (See character 7, below).
2-6	The number of the spool request.
7	The number of the output request, expressed as a letter of the alphabet: A = 1, B = 2, and so on. If more than 26 output requests have been generated, then character 1 is used as well to form a two-character identification code, starting with the letter "Q": QA, QB, QC,... QZ, RA, RB, and so on.



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Testing a Printer Installation under UNIX

Testing a Printer Installation under UNIX

There is no perfect test for printing under UNIX. You can test for most problems by sending a text file that has the following properties to the printer:

- The text should be more than two pages long. This tests the page break between the first and the second page and between a page in the middle of a text and the following page.
- The text should contain long lines.
- You may find that the text must contain a RETURN character before every LINEFEED character.
- The print command should be identical to the one that you have specified in the SAP System profile parameter `rspo/host_spool/print` for printing from the SAP System.

In general, you must be able to print successfully on a printer from the UNIX host system in order to print successfully from the SAP System.



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AS/400 Printing: General Information

Data to be printed from the R/3 System is first formatted by the spool work process of the R/3 System. The formatted data is then passed to the host spool system.

For more information on spool administration, see the non-platform-specific sections of this documentation and the IBM documentation *OS/400 Printer Device Programming* (document number SC41-4713).

AS/400 Printing: AS/400 Printer Commands

AS/400 Printing: AS/400 Printer Commands

Here is a brief description of some commands that are frequently used for printer administration on AS/400.

CRTDEVPRT (Create a Printer Device Description)	Use this command to create an AS/400 device description. The device description contains the printer type, information about how the printer is connected to the AS/400, and a number of other parameters.
CRTOUTQ (Create Output Queue)	Before being passed to the printer, spool files are stored in an output queue. The definition of an output queue contains information such as the name of the output queue and the type of printer connection.
STRPRTWTR (Start a Printer Writer)	This command assigns a local printer to an output queue. When you run this command, spool files stored in an output queue are passed to the printer.
STRRMTWTR (Start a Remote Writer)	This command assigns a remote (network) printer to an output queue. Spool requests are then passed to the specified host (to which the printer is connected).
WRKWTR (Work with Writers)	The options provided by this command allow you to work with printers and spool requests.
WRKOUTQ (Work with Output Queue)	This command allows you to manipulate the contents, status and other parameters of an output queue.

AS/400 Printing: Installing a Printer on AS/400

Process Flow

Spool requests are passed to an output queue, which passes the data on to the connected printer.

This method utilizes the spool request administration functions provided by the AS/400.

For more information about what you have to enter in the R/3 spool administration function, see [AS/400 Printing: R/3 Spool Administration Settings \[Page 122\]](#)

AS/400 Printing: Connecting a Printer using TCP/IP**AS/400 Printing: Connecting a Printer using TCP/IP**

If your printer is connected to the AS/400 across a network using TCP/IP, the formatted print requests are passed from the R/3 System to an AS/400 output queue. Subsequently, they are passed from the output queue to the connected printer. Before you can print using a network printer, you must have created an output queue and started the printer.

Procedure

1. Enter the TCP/IP address for the printer in the host table using the functions provided by the CFGTCP menu. For details of the procedure, see [AS/400 Printing: Configuring TCP/IP \[Page 109\]](#).
2. To create the output queue, use AS/400 command CRTOUTQ



```
CRTOUTQ OUTQ(QGPL/PRT1) RMTSYS('P100') RMTprtQ('P100')  
CNNTYPE(*IP) DESTTYPE(*OTHER) MFRTYPMDL(*HP4)
```

In this example, output queue PRT1 is created in the library QGPL. PRT1 passes the spool requests to the printer P100. The printer, in this case, is a printer of type HP4.

3. To start the printer, enter the command STRRMTWTR (Start Remote Writer), specifying the name of the output queue as a parameter:

```
STRRMTWTR OUTQ(<output_queue_name>)
```

AS/400 Printing: Configuring TCP/IP

Printers that are not directly connected to an AS/400, but that communicate with the AS/400 across a network using TCP/IP, require an entry in the TCP/IP host table. The same applies to PCs to be used for printing using SAPIpd.

Procedure

To add TCP/IP addresses:

1. Enter `GO CFGTCP` at the command line to call the *Configure TCP/IP* menu.
2. Choose option 10 (*Work with TCP/IP Host Table Entries*).
3. Enter 1 (Add). Enter the TCP/IP address in the entry screen that appears.
4. For *Internet address*, enter the Internet address associated with the host, for example, "123.45.678.901".
5. For *Host names*, enter the relevant host name with and without domain, for example. "X00001.wdf.sap-ag.de" or "X00001".
6. For *Text 'description'*, enter a text such as `Printer in room 11`.

AS/400 Printing: Printer Directly Attached**AS/400 Printing: Printer Directly Attached**

1. To create a device description (*DEV) for a directly attached printer use CRTDEVPRT (e.g. IBM3916); this creates an output queue with the same name as well.
2. To start the printer, enter AS/400 command STRPRTWTR



```
STRPRTWTR DEV (IBM3916)
```

AS/400 Printing: AFP Printing

Prerequisites

Before you can print with AFP, you must have:

- Installed the OTF-AFP converter (AFP Print Suite/400).
- Created and started the AFP printer.

Procedure

1. To create an AFP printer, use the AS/400 command `CRTDEVPRT`. Here is an example of what the command might look like:

```
CRTDEVPRT DEVD (IBM3916) DEVCLS (*LCL) TYPE (*IPDS) MODEL (0)
AFP (*YES) PORT (1) SWTSET (1) CTL (CTL01) FONT (011)
```

2. To start the printer, enter AS/400 command `STRPRTWTR`. Here is an example of what the command might look like:

```
STRPRTWTR DEV (IBM3916)
```

In the R/3 System, two EBCDIC-AFP device types have been defined for AS/400: IBMEFP and IBMEFP3.

AFP Printing using Access Method 'L'

As of Release 4.0A, an OTF-AFP converter can be installed on an AS/400 to provide support for AFP printing from the R/3 System. This converter is accessed using access method "L", which requires the following settings:

1. Call transaction SPAD.
2. On the screen *Spool Administration: Initial Screen*, choose *Configuration* → *Output device*.
The screen *Spool Administration: List of Output Devices* appears.
3. Choose *Change*.
4. Choose *Output device* → *Create*.
The screen *Create Spool Administration: Output Device* appears.
5. In the field *Output device*, enter a name to identify the output device.
6. In the field *Device type*, select a suitable device.
7. In the field *Spool server*, select a server.
8. Choose *HostSpoolAccMethod*.
8. Enter access method `L`.
9. Choose *Edit* → *Command set*.
10. In the *Command recordID*, field enter a letter and double-click the field.

The dialog box *Create Output Device* appears.

AS/400 Printing: AFP Printing

11. In the field *Command to transfer print data*, enter:
`/QSYS.LIB/QPRTTOOL.LIB/CVTPRTDTA.CMD OBJ (&F) OUT (&P) .`
12. Choose *Enter*.

To be able to print with AFP on AS/400, you must have installed IBM's AFP converter. The converter consists of the following products: 5798-AF3 PrintSuite/400, 5769SS1 PSF/400 and the corresponding font libraries.

Result

The R/3 spool system considers an output request completed once it has been passed to the AFP converter. Therefore, the option *Do not query host spooler for output status* must be activated.

For more information about AFP printing, see the IBM documentation *SAP R/3 AFP: Printing on the AS/400* (Document S544-5412).

AS/400 Printing: SAPIpd Printing on AS/400

In order to be able to print at your frontend PC using the SAPIpd printer daemon, you must have entered the address of the PC in the TCP/IP host table. You do not have to create an output queue because the data is passed from the R/3 spool system to the PC (and thus to the printer) over the network.

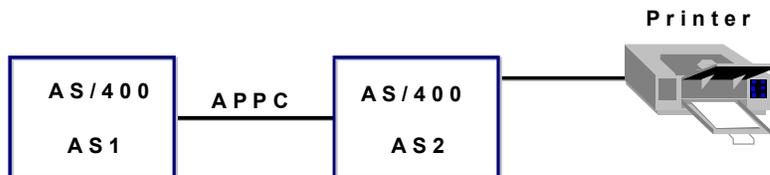
AS/400 Printing: Printer Shared Among AS/400 systems

AS/400 Printing: Printer Shared Among AS/400 systems

If you are working on an AS/400 application server and want to use a printer connected to a different AS/400, you have to begin by either setting up a network or APPC connection between the two AS/400 systems, or using the TCP/IP with an output queue of the connection type *IP.

The process of setting up an Advanced Program-to-Program Communication (APPC) connection is explained here with the help of a simple example. For technical details and a precise explanation of the various parameters involved, see the IBM documentation *OS/400 Printer Device Programming* (document number SC41-4713).

For the purposes of the example, let us assume that there is an R/3 System running on an AS/400 "AS1". Print requests are to be passed from this system to another AS/400 "AS2", which is connected to a printer. Before this can be done, an APPC connection must be established between the two AS/400 machines.

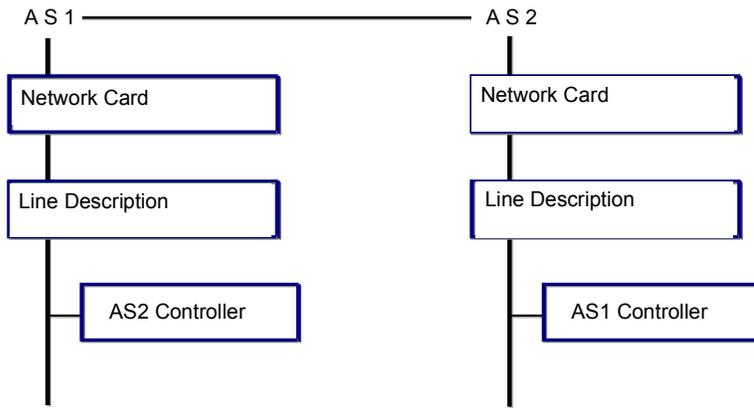


The APPC Connection

Process Flow

1. [Create a Line Description \[Page 116\]](#)
2. [Generate a Controller \[Page 117\]](#)
3. [Activate the Controller \[Page 118\]](#)
4. [Set Up the Distribution Service \[Page 119\]](#)
5. [Add Users \[Page 120\]](#)
6. [Set Up Output Queues \[Page 121\]](#)

AS/400 Printing: Printer Shared Among AS/400 systems



Components of APPC Connection

AS/400 Printing: Creating a Line Description

AS/400 Printing: Creating a Line Description

Procedure

Before starting an R/3 System, a line description must be created. Usually a description already exists.

The line description establishes the connection between the network card and the software controller.

The line description must be created on both AS/400 machines, in our example "AS1" and "AS2". For more information, see the section "Configuring TCP/IP" in the guide *SAP System Installation: IBM AS/400*.



1. Execute AS/400 command `WRKHDWRSC` (Work with Hardware Resources) to determine the name of the Ethernet adapter:

```
WRKHDWRSC TYPE (*CMN)
```

2. Create the line description using the command `CRTLIN*`

For a line description "ETHLINE", the command would be as follows:

```
CRTLINETH LIND(ETHLINE) RSRNAME(LIN02) EXCHID(056A0001)
```

For the parameter `RSRCNAME`, enter the name of the Ethernet adapter you found with the command: `WRKHDWRSC TYPE (*CMN)`.

The parameter `EXCHID` must start with 056. The remainder of the name is arbitrary.

The command entries may be different on the two AS/400 machines, in our example "AS1" and "AS2".

AS/400 Printing: Creating a Controller

To enable communication from AS/400 system "AS1" to a second AS/400 system "AS2", a controller must be generated on AS1. To enable communications in the other direction (from AS2 to AS1), a controller must be generated on AS2.

To set up the controller on AS1, proceed as described below. Use the same procedure to set up the controller on AS2.

Procedure

1. Enter AS/400 command `CRTCTLAPPC` (Create Control Description (APPC):



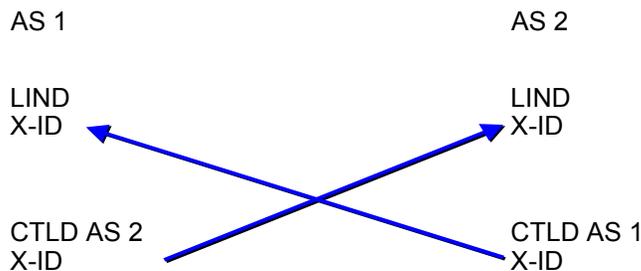
```

CRTCTLAPPC      CTLD (AS2)

LINKTYPE (*LAN)
SWTLINLST (ETHLINE)
RMTCPCNAME (AS2)
EXCHID (056A0002)
ADPTADR (000203535F222)
    
```

For the sake of clarity, the controller for communications from AS1 to AS2 has been given the name "AS2". It would make sense to name the controller on AS2 (for communications from AS2 to AS1) "AS1".

2. For the parameter `SWTLINLST` (Switched line list), enter the name of the line description
3. To find the correct entry for the parameter `RMTCPCNAME` (Remote control point), enter the command `DSPNETA` on the other AS/400 machine (that is, the one where you are not currently activating the controller).
4. To find the entries for the parameters `EXCHID` and `ADPTADR`, enter the command `WRKLIND` on the other AS/400 machine, and choose option 5 on the appropriate line to display the line description for "ETHLINE".



Relationship Between Exchange ID and Line Description

AS/400 Printing: Activating the Controller

AS/400 Printing: Activating the Controller

To activate the controller on both AS/400 "AS1" and a second machine "AS2", run the `WRKCTLD` (Work with Controller Descriptions) command on both machines.

Procedure

1. Enter the command `WRKCTLD`.
2. Choose option 8 (Work with Status).
3. Choose option 1 (Vary on).

AS/400 Printing: Setting Up Distribution Service

The distribution service must be set up on both AS/400s, in this case "AS1" and "AS2".

Procedure

1. To call the Network Configuration menu, use the command: `GO NETCFG`
2. To go to the display "Configure Distribution Services", enter 2 in the command line
3. For *Type of distribution services information to configure*, select 1 (Distribution queues)
4. Position your cursor on the *Opt* field for the queue "AS2" and press F6 to add a distribution queue
5. For *Queue*, enter `AS2`
6. For *Remote location name*, enter `AS2`.
7. Return to the Network Configuration menu.
8. Choose 2 (Routing table) and press F6 (Add Routing Table Entry).
9. Repeat the procedure on the other AS/400 machine, entering `AS1` in place of `AS2`.

AS/400 Printing: Adding a User

AS/400 Printing: Adding a User

You have to define a user on each of the two machines to allow one machine to be accessed from the other. The user `QNETSPLF` is used for printing tasks.

Do the following on both AS/400s, "AS1" and "AS2".

Procedure

1. Enter the command `WRKDIR` (Work with Directory Entries).
2. Choose option 1 (Add).
3. For *User ID/Address*, enter the user `QNETSPLF` and the name of the machine on which the user is located.
4. For *Description*, enter a text of your choice.
5. The *System name/Group* is the name of the local AS/400 system. This entry is proposed by the system.
6. For *User profile*, enter `QNETSPLF`.
7. For *Network user ID*, enter the name of the AS/400 proposed under *System name/Group*

AS/400 Printing: Setting Up Output Queues

Prerequisites

Once the printer and output queue have been configured on one AS/400 (in our example, AS2), the necessary settings have to be made on the other AS/400 (AS1).

Procedure

1. Set up an output queue on the first AS/400 (in our example, AS1) For the procedure, see [AS/400 Printing: Printer Directly Attached \[Page 110\]](#)



The parameter `CNNTYPE` from the `CRTOUTQ` command must be set to the value `*SNA`.

2. To start the printer, enter the command `STRMTWTR`

AS/400 Printing: R/3 Spool Administration Settings

AS/400 Printing: R/3 Spool Administration Settings

You must enter various information in the spool administration function of the R/3 System. This information includes, for example, device type and access method.

To call the function, select *Tools* → *CCMS* → *Spool* → *Spool administration*.

Here are some examples of entries for different types of printer.

IBM SCS Printer

<i>Device type</i>	IBMSCS (or IBMSCS2)
<i>Spool server</i>	<host_name>_<SID>_<SAP_instance> for example, as0001_c11_00
<i>Destination host</i>	<host_name>
<i>Host printer</i>	Name of the output queue (*OUTQ)
<i>Device class</i>	
<i>Access method</i>	C

ASCII Printer

<i>Device type</i>	Select an appropriate printer
<i>Spool server</i>	<host_name>_<SID>_<SAP_instance> for example, as0001_c11_00
<i>Destination host</i>	<host_name>
<i>Host printer</i>	Name of the output queue (*OUTQ)
<i>Device class</i>	
<i>Access method</i>	C

ASCII Printer via SAPIpd

<i>Device type</i>	HPLJ5SI
<i>Spool server</i>	<host_name>_<SID>_<SAP_instance> for example, as0001_c11_00
<i>Destination host</i>	For example, P13013
<i>Host printer</i>	For example, \\p10530\P156
<i>Device class</i>	
<i>Access method</i>	U

AS/400 Printing: R/3 Spool Administration Settings

AFP Printer

<i>Device type</i>	IBMEFP (or IBMEFP3)
<i>Spool server</i>	<host_name>_<SID>_<SAP_instance> for example, as0001_C11_00
<i>Destination host</i>	<host_name>
<i>Host printer</i>	Name of the output queue (*OUTQ)
<i>Device class</i>	
<i>Access method</i>	L

For AFP printing, you also have to specify a suitable command set in the *HostspoolAccMethod* of the output device profile.



See also [AS/400 Printing: AFP Printing \[Page 111\]](#)

Access Method "L"

<i>Device type</i>	
<i>Spool server</i>	<host_name>_<SID>_<SAP_instance> for example, as0001_C11_00
<i>Destination host</i>	<host_name>
<i>Host printer</i>	Name of the output queue (*OUTQ)
<i>Device class</i>	
<i>Access method</i>	L

Definition of Frontend Printers

Definition of Frontend Printers

Frontend (or local) printing lets your users print on their local printers. These local printers do not have to be defined individually in the SAP System. You have to create a “representative” output device for each operating system platform. For more information about frontend printing, see *Help* → *Application help* or [Frontend Printing on Undefined Printers \[Page 23\]](#).

How Frontend Printing Works

Frontend printing works on Microsoft Windows PCs, Apple Macintosh computers, and on UNIX workstations. Frontend printing is intended for a limited number of users in an SAP System who want to print out their screen display quickly.

If a user requests immediate printing, then the output data is downloaded directly to SAPIpd on a Windows PC or to the lpd/lpr on a UNIX workstation.

Under Windows, the output is sent to the default printer.

Under UNIX and Macintosh, there is no default printer. The output is therefore sent to the printer whose name corresponds to the host printer you specify in the frontend printing device definition.

For more information, see [Defining Devices for Frontend Printing \[Page 125\]](#).



In order for users to print to their local printers, you must enter the device name of the frontend printer and %LOC in the authorization object S_SPO_DEV.



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Defining Devices for Frontend Printing

The use of frontend printing is the same at all frontend workstations and PCs. Just enter the name of a special frontend printer in the R/3 print options dialog.

But setting up frontend printing differs depending on whether your SAP GUI frontend software is running on a Macintosh, UNIX workstation, or Windows PC. The next section describes the set-up and printing procedures.

Prerequisites – Microsoft Windows

- SAP GUI frontend software version: Make sure the SAP GUI software on your PC is version 3.1G or higher.
To check: Start the R/3 logon program. The version is indicated in the title bar.
- SAPIpd version: Make sure the SAPIpd program on your Windows PC has a version number higher than 2.42.
To check: Start SAPLLPD.EXE. Choose *Help* → *About* to display the version number. If the SAPIpd program is too old, you can get the newest version by installing the latest SAP GUI frontend software. Always make sure that you have the latest version of SAPIpd.

Prerequisites – UNIX

- SAP GUI frontend software version: Make sure that the SAP GUI software on your PC is version 3.1G or higher.
To check: Start the R/3 logon program. The version is indicated in the title bar.
- UNIX printer: To use frontend printing at UNIX workstations, ensure that each frontend workstation has a printer named `__DEFAULT` (underscore underscore DEFAULT).
UNIX systems do not offer a default printer designation that can be used for frontend printing. To use frontend printing, you must therefore define a UNIX printer whose name matches the value in the *Host printer* field.
- lp/lpd daemon: Make sure that lp or lpd (depending upon your UNIX system) has been started on your workstation.

Prerequisites – Macintosh

- SAP GUI frontend software version: Make sure that the SAP GUI software on your PC is version 3.1G or higher.
To check: Start the R/3 logon program. The version is indicated in the title bar.
- lpd shareware: You must install software on your Macintosh that makes printing by way of an lpd printer daemon possible, as on a UNIX system.
For more information, see the "local printing README" file located in the Documentation folder in your SAP GUI folder. This file describes in detail how to install and set up the shareware application named "lpDaemon" on the Macintosh.
- Macintosh printer: A printer named `__DEFAULT` (underscore underscore DEFAULT) must be defined in the LPD program on the Macintosh.

Defining Devices for Frontend Printing



If communication between frontend PCs and application servers in your SAP System runs through SAProuter, you should release the port for the gateway server in table SAPROUTTAB.

Procedure

1. Call the *Spool Administration* transaction (SPAD) and choose *Output devices* on the *Devices / servers* tab page. Choose *Output device* → *Create*, to create a new device definition or *Output device* → *Create using template*, to copy an existing output device configuration.
2. Fill out the remaining fields as follows:

	Field	Input
<i>DeviceAttributes</i> tab page	<i>Output device</i>	Create a new device and assign it a name that will be recognizable to your users as a frontend printer. If you are defining devices for a mixture of frontend systems, then a systematic naming convention is especially important.
	<i>Device type</i>	SWIN is recommended for Windows PCs. If you want, you can also use model-specific device types instead of SWIN at a PC. Example: if you have a PostScript printer, you can enter the POSTSCPT device type. SWIN is not supported at UNIX workstations. Here, you must enter the device type appropriate for the workstation printer.
<i>HostSpoolAccMethod</i> tab page	<i>Host spool access method</i>	Enter access method F for frontend printing

Defining Devices for Frontend Printing

	<p><i>Host printer</i></p>	<p>Enter the name __DEFAULT (underscore underscore DEFAULT) to use the default printer on a Microsoft Windows system. If no default printer is defined, then the SAPIpd program attempts to execute frontend printing at the printer on LPT1.</p> <p>In UNIX and Macintosh frontends, a printer with this name must be defined. Otherwise frontend printing will not be completed.</p> <p>You can enter another name instead of __DEFAULT if you want. However, a printer with this name must exist on each PC, Macintosh, or UNIX workstation where frontend printing occurs.</p>
--	----------------------------	--

3. Once you save the device definition, it is available to your users.

Tell your users to enter this device in the *Output device* field in the print selection screen when they want to use frontend printing.



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Definition of PostScript Printers

Definition of PostScript Printers

You can use generic settings for several of the fields in the identification of a PostScript printer to the SAP spool system. The table below shows the settings for PostScript printers.

Defining PostScript Printers

Component of Definition	Field	Value
Output device	<i>Device type</i>	POST2
Device type	<i>Driver (SAPscript)</i>	POST
Device type	<i>Driver (lists)</i>	POST (or specify in individual device type formats)
Device type format	<i>PostScript format</i>	Marked

The POST2 device type is generic; use it for defining all PostScript printers. Likewise, the two *SAPscript* POST printer drivers are suitable for device type definitions for all PostScript printers.

If you add device type formats of your own to the POST2 device type, select this field.

Selecting this field makes the spool system "escape" any PostScript meta characters that occur in the text, such as parentheses. Escaping these characters prevents them from being interpreted as parts of PostScript commands.



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Device Pools

Pools allow you to group multiple output devices providing the following advantages:

- **Print on more than one device at a time.**

You can have an output request printed on all of the output devices in a pool.

Example: Assume that a type of output document is routinely needed at more than one location in your company. You can set up a printer pool that includes the printers at each of the locations where the document is needed.

When this type of document is to be printed, your users can specify the printer pool at the destination printer. The document is printed out on each printer in the pool.

- **Alternate printing between the printers in a pool.**

You can distribute output requests to the different devices in a pool.

Example: For a critical printing application, you have set up two printers side-by-side. By setting up a pool for the printers, you can have the spool system issue output requests to the pooled printers.

Assigning a printer to a pool does not prevent you from addressing the printer individually as well. To print on a pool printer without addressing the other printers, just specify the printer's name instead of the pool name when you print.

For information about assigning output devices to a pool, see [here \[Page 130\]](#).

Using Device Pools as Logical Devices

In some situations, it is useful to use device pools as "logical devices." That is, you define a pool and assign a single output device to it. You then use the pool name – which never changes – to identify the printer for such special purposes as Customizing. If you need to, you can then substitute a different printer simply by entering a new printer name in the pool definition. The logical name remains the same and does not have to be changed.



For some functions in Customizing, you must identify a particular printer for certain kinds of output. In the inventory management system, for example, you must specify the printer for system output by plant or location.

If you use pools to define logical printer names, you can enter these names permanently in Customizing. If output needs to be diverted to another printer (due to a hardware problem, for example), you only need to change the pool definition. You do not need to change any of the Customizing settings.



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Assigning an Output Device to a Pool

Assigning an Output Device to a Pool

To create a printer pool proceed as follows:

1. Define the printer pool. To do this, call *Spool Administration* (transaction SPAD) and choose *Output devices* on the *Devices / servers* tab page. Then choose *Change* and *Create*.
2. Enter a name for the printer pool. This is the name uses use to access the pool.
3. On the *HostSpoolAccMethod* tab page, choose *P: Device pool* for the *Host spool access method* and confirm your entries.
4. On the *DeviceAttributes* tab page, enter the device type of the printers to be assigned to the pool

In general, all printers that you include in a pool should have the same device type. The spool system uses the device type to decide how to format an output request.

5. Choose *Device pool* and add the individual devices to the pool.
6. In the next step, specify whether requests should be sent to one device (for even distribution of print requests) or to all devices in the pool.



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Defining Logical Output Devices

Prerequisites

You can also define output devices as "logical" devices. These logical devices refer to physical devices or to other logical devices, so that you can set up a (logical) printer hierarchy. This is useful in the following case, for example.



You are defining a logical printer "Shipment document printer" that maps to a physical printer "P330". If your logical printer is to map to the physical printer "P521", you only need to change the mapping. You do not need to alter the entire device definition. Nothing changes at application level, since the logical printer "Shipment document printer" is configured as a printer.

Using logical output devices, you can also easily transport a whole printer hierarchy into a different system. You then assign the physical devices in the other system.

Procedure

1. Choose *Tools* → *CCMS* → *Spool* → *Spool administration* and then *Output devices* on the *Devices / servers* tab page. Choose *Change* and then *Create* to create a new device definition.
2. Fill in all required fields.
3. Choose *Edit* → *Convert* → *Logical device*.
4. In *Map to*, specify the physical device to which the local device is to map.
5. Save your entries.



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Special Printing Functions

Use

You can use the following special printing functions with the SAP spool system:

- [Color Printing \[Page 133\]](#): Color printing of SAPscript texts and ABAP lists on color printers
- [Duplex Printing \[Page 134\]](#): DUPLEX and TUMBLE printing on printers that support these functions
- [Paper Tray Selection \[Page 135\]](#)
- [Printing Icons \[Page 137\]](#)
- [Printing the euro Symbol € \[Page 138\]](#)
- [OCR Printing \[Page 139\]](#): Printing *Optical Character Recognition* (OCR) characters
- [Outputting Bar Codes \[Page 147\]](#) in SAPscript texts
- [Printing Labels \[Page 164\]](#): Printing labels on special printers using utility programs

Prerequisites

Go to the documents named in the links above for information about the prerequisites for using the individual functions.



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Color Printing

Prerequisites

If your output device uses one of the following device types:

- HPLJ4000
- KYOFS170
- POST2
- SWIN

you can print lists and *SAPscript* texts with uploaded graphics in color.

Activities

Edit the definition of the output device. Call the *Spool Administration* transaction (SPAD). Enter the name of the output device in the *Output device* field on the *Devices / servers* tab page. Save your entry.

Go to the *Output attributes* tab page and select *Color printer*.



If you want to print both in color and black and white on your printer, you should create an individual output device for every print mode (for example, `PRINTER_COL` and `PRINTER_MON`).



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Duplex Printing

Duplex Printing

Duplex printing of SAPscript texts

Information about whether output is on one page, duplex, or tumble, is specified in the SAPscript text form. For more information see the section *Print Mode* in [Pages in SAPscript Forms \[Ext.\]](#) as well as the SAP Note 96102.

The following print controls are used to control duplex printing:

SPMBS	Selects reverse side of page for duplex printing (DUPLEX/TUMBLE DUPLEX)
SPMBU	Begin DUPLEX mode (print on both sides of the page starting with this page)
SPMSI	Begin SIMPLEX mode (print on only one side of the page starting with this page)
SPMTU	Start TUMBLE DUPLEX mode (print on both sides inverted)

Device definition for duplex printing of SAPscript texts

If the SAP device definition for your printer does not contain the print controls described above, do the following:

1. [Copy \[Page 254\]](#) the device type.
2. Add the required [Print Controls \[Page 272\]](#) and the printer-specific escape sequences. For information about what to enter, see your printer manual.
3. Create an [Output Device \[Page 49\]](#) with the new device type.



To test duplex printing, use the standard text `SAPSCRIPT-PRINTMODETEST`. To do this, choose *Utilities* → *For device types* → *Test data(SAPscript)*.

Duplex printing of ABAP lists

You can print ABAP lists in duplex, if your printer supports duplex printing and uses one of the following device types:

- HPLJ4000 Device type for PCL-5 printers
- KYOFS170 Device type for PRESCRIBE II printers
- POST2 Device type for PostScript Level 2 printers

Device definition for duplex list printing

To be able to use both the simplex and duplex mode of your printer, create two different device definitions. For information about how to do this, see [Creating Output Devices \[Page 49\]](#).

On the *Output attributes* tab page for the device definition, specify the desired *Print mode*.



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Printing from Multiple Paper Trays

Use

If your printer has multiple paper trays, you can control which one is used from the SAP System.

Tray selection for SAPscript texts

Information about which paper tray to use for SAPscript texts is specified in the SAPscript form. For more information, see the section *Print Mode* in [Pages in SAPscript Forms \[Ext.\]](#).

The following [Print Controls \[Page 272\]](#) are used to control tray selection:

TRY01	Paper tray 1
TRY02	Paper tray 2
TRY03	Paper tray 3
TRYEN	Paper tray for envelopes
TRYME	Manual envelope feed
TRYMN	Manual paper feed

Device definition

If the SAP device definition for your printer does not contain the print controls described above, do the following:

4. [Copy \[Page 254\]](#) the device type.
5. Add the required [Print Controls \[Page 272\]](#) and the printer-specific escape sequences. Look in your printer manual for information about what to enter.
6. For list printing: Create a format type and add this to the device type definition. For the initialization action, enter the command for selection of the desired tray. For information about the procedure, see [Defining a New Device Type \[Page 249\]](#).
7. Create an [Output Device \[Page 49\]](#) with the new device type
8. Choose *Tray info* in the device definition and enter the available paper formats

Background: The SAP spool system cannot use this information to switch paper trays according to the output. But it does use this information to detect potential incompatibilities between the output format and the available paper types. It then chooses the best available format for printing at this device.



To test tray selection, use the standard text `SAPSCRIPT-TRAYTEST`. To do this, choose *Utilities* → *For device types* → *Test data(SAPscript)*.

Device definition (with list printer drivers)

If your output device uses one of the following device types:

- HPLJ4000 Device type for PCL-5 printers
- KYOFS170 Device type for PRESCRIBE II printers

Printing from Multiple Paper Trays

- POST2 Device type for PostScript Level 2 printers

go to the *Output attribute* tab page in the device definition. Under *Paper tray*, specify the default tray to use for printing lists. For *Tray info*, enter the page formats available at the printer. If *Tray info* is not available, the system prints using an intersection of the DINA4 and LETTER page formats.

If you want to use several of your printer's trays, you must create an output device for each paper tray, for example, P99_TRAY1, P99_TRAY2, and so on.



If your printer does not use any of the specified device types, you must add a command to activate a particular paper tray to a format. For more information, see [Creating Formats \[Page 257\]](#).



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Printing Icons and Symbols

SAP icons and symbols are defined as special SAP-specific characters.

Icons and symbols in SAPscript texts

For printing these, use output devices whose device type uses one of the following printer drivers:

- HPL2 (PCL-5 printers, such as HPLJ4, HPLJ5, HPLJ5SI, or HPLJ4000)
- POST (PostScript printers, such as POSTSCPT, or POST2)
- PRES (PRESCRIBE printers, such as KYOFS150, or KYOFS170)
- SWIN (device types SAPWIN/SWIN and country-specific versions)

Icons and symbols in ABAP lists

If you also want to print these characters in lists, you must define an output device with one of the following device types:

- HPLJ4000 Device type for PCL-5 printers
- KYOFS170 Device type for PRESCRIBE II printers
- POST2 Device type for PostScript Level 2 printers



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Printing the euro Symbol (€)

Printing the euro Symbol (€)

Features

The following device types support printing of the euro symbol (€):

HP5MI	HP LaserJet 4 w.JetCAPSMICR
HPLJ4	HP LaserJet 4 series PCL-5
HPLJ4000	HP LaserJet 4000
HPLJ5	HP LaserJet 5
HPLJ5SI	HP LaserJet 5 Si
HPLJIIID	HP LaserJet 3 series PCL-5
HPLJMI	HP LaserJet 4 w.JetCAPSMICR
I2HP4	HP LJ 4 series Latin 2 charset
I2SWIN	Release 3.0E+/SAPlpd 4.00+ Latin-2
I9HP4	HP LJ 4 series ISO 8859/9
LTSAPWIN	Windows printer using SAPlpd Lithuanian
SAPWIN	Release 4.x/SAPlpd 4.09+
SAPWIN5	Release 3.0E+/SAPlpd 3.08+ ISO-5
SWIN	Release 4.x/SAPlpd 4.09+



Currently, only the SWIN/SAPWIN device types support the euro symbol included in some printer-specific character sets. The other device types use a temporary solution of printing a "c" and "=" on top of each other to represent the euro symbol. For more information about the euro symbol, see SAP Note 129581.



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Printing OCR Characters

Optical character recognition (OCR) fonts are machine-readable character sets widely used in financial documents. The OCR-A character set, for example, is used for printing routing information about checks.

See the following links, for information about:

- Which types of printers SAP has defined to support [OCR Printing \[Page 140\]](#)
- The procedure for [Setting Up OCR Printing \[Page 143\]](#) for other printer types.

Hardware/Software Requirements

To print OCR fonts, a printer requires either special built-in character sets or additional hardware or software. Some printers cannot print OCR characters at all. Be sure to check that this feature is available before you purchase a printer.

Testing OCR Printing

You can test OCR printing using the test procedure described in [Testing Output Device \[Page 214\]](#).



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Printer Types that Support OCR Printing

Printer Types that Support OCR Printing

SAP delivers definitions for many types of printers with the SAP System. The definitions for the following types of printers include support for OCR printing. That is, the necessary print controls for switching OCR printing on and off have been predefined for you. You must still ensure that your printer has the necessary built-in or add-on capability of printing OCR characters.

The following list shows the R/3 printer types which include predefined support for OCR printing:

EPESCP	All Epson 24-pin and 48-pin dot matrix printers Support for: OCR-A, OCR-B. Some printers require an add-on for OCR printing.
EPESCP2	Epson printers that use the ESC/P2 printer language Support for: OCR-A, OCR-B. Some printers require an add-on for OCR printing.
EPLQ550	Epson LQ-550 matrix printer Support for: OCR-A, OCR-B. Some printers require an add-on for OCR printing.
HPLJ_II	Hewlett-Packard LaserJet II series laser printers Support for: OCR-A, OCR-B, add-on cartridge required
HPLJIIID	Hewlett-Packard LaserJet III series laser printers Also, in PCL-5 mode, IBM 3912/3916, Lexmark 4039, and Siemens-Nixdorf 4819/4820 laser printers. Support for: OCR-A, OCR-B, add-on cartridge required
HPLJ4	Hewlett-Packard LaserJet4 laser printers. Also, in PCL-5 mode, IBM 3912/3916, Lexmark 4039, and Siemens-Nixdorf 4819/4820 laser printers. Support for: OCR-A, OCR-B, add-on cartridge required
HPLJ4000	Hewlett-Packard 4000 laser printers and related models (such as LaserJet 5000). Support for: OCR-A, OCR-B, add-on cartridge required
HPLJ5	Hewlett-Packard LaserJet5 laser printers (LaserJet 5/5M, 5P/5MP, 5C, but not HP LaserJet 5Si) Also, in PCL-5 mode, IBM 3912/3916, Lexmark 4039, and Siemens-Nixdorf 4819/4820 laser printers. Support for: OCR-A, OCR-B, add-on cartridge required
HPLJ5SI	Hewlett-Packard LaserJet 5Si Support for: OCR-A, OCR-B, add-on cartridge required
HP2300	Hewlett-Packard 2300 series line printers Support for: OCR-A, OCR-B, printer add-on required
HP256X	Hewlett-Packard 256 series line printers Support for: OCR-A, printer add-on required
IBM4232	IBM 4232-302 line printer Support for: OCR-A, OCR-B. The printer comes with OCR-A and OCR-B printing capability.

Printer Types that Support OCR Printing

IBM 6408	IBM 6408-A00 line printer Support for: OCR-A, OCR-B. The printer comes with OCR-A and OCR-B printing capability.
I2HP4	Device type for Eastern Europe for all Hewlett-Packard LaserJet 4 series laser printers. Support for: OCR-A, OCR-B, printer add-on required
I9HP4	Device type for Turkey for all Hewlett-Packard LaserJet 4 series laser printers. Support for: OCR-A, OCR-B, printer add-on required
LX4039	Lexmark 4039 series laser printers Support for: OCR-A, OCR-B, add-on cartridge required
MT2033	Mannesmann-Tally T2033 matrix printer Support for: OCR-A. The printer comes with OCR-A printing capability.
MT2045	Mannesmann-Tally T2045 matrix printer Support for: OCR-A. The printer comes with OCR-A printing capability.
MT600GER	Mannesmann-Tally MT600 line printer with German character set Support for: OCR-A, OCR-B (DIN), printer add-on required
MT600NDA	Mannesmann-Tally MT600 line printer with Norwegian/Danish character set Support for: OCR-A, OCR-B (DIN), printer add-on required
MT6045	Mannesmann-Tally T6045 matrix printer Support for: OCR-A. The printer comes with OCR-A and OCR-B printing capability.
MT691	Mannesmann-Tally T691 matrix printer Support for: OCR-A. The printer comes with OCR-A and OCR-B printing capability.
NECP72	NEC P62/P72 matrix printers Support for: OCR-A, OCR-B, printer add-on required
SNIZD13	Siemens-Nixdorf SNI ZD13 line printer Support for: OCR-A. The printer comes with OCR-A printing capability.
SNI4010	Siemens-Nixdorf SNI 4010 line printer Support for: OCR-A, printer add-on required
SNI4011	24-pin version of the Siemens-Nixdorf SNI 4011 matrix printer Support for: OCR-A, OCR-B. The printer comes with OCR-A and OCR-B printing capability.
SNI9014	Siemens-Nixdorf SNI 9014/12 line printer Support for: OCR-A, OCR-B. The printer comes with OCR-A and OCR-B printing capability.

Printer Types that Support OCR Printing



For the most up-to-date information about predefined OCR support, see SAP Note 8928.



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Adding OCR Support

If you want to enable OCR printing:

- On a new type of printer
- For a printer which SAP did not predefine with OCR support

You must add OCR support to the printer definition in the SAP spool system and *SAPscript*. Do the following:

- Check whether the character set specified for the printer contains the correct hexadecimal codes for OCR special characters. This step is only required for OCR-A printing as only the OCR-A character set contains special characters.
- Define the print controls that switch OCR printing on and off at the printer.

To add OCR printing support, do the following:

1. [Copy the device type definition of the printer \[Page 254\]](#) with which you are working. You can skip this step if you are adding a new type of printer to the SAP System.

Use the new device type in all the printer definitions you set up for OCR printing.

2. Copy the R/3 character set used by the printer. You can skip this step if you are defining a new character set for the printer.

To determine which character set a printer uses, check the device type definition. Choose *Tools* → *Spool* → *Spool administration* and then *Full administration* and then *Device types*. Double-click a device type. The first character set in the definition is the standard character set.

To copy the character set, start by selecting *Tools* → *CCMS* → *Spool* → *Spool administration*, *Full administration* and then *Character sets* on the *Char. sets* tab page.

Find the R/3 character set identified in the device type definition with which you are working. Mark the character set with the cursor, choose *Change* and then *Create with reference*.

On the following screen, enter a new ID number for the new character set. The number **must** begin with the number **9**. This naming convention protects your character set from conflicting with the standard R/3 character set. You can leave the other specifications on the screen unchanged.

3. Check whether your new character set uses the correct hexadecimal values for OCR-A printing on your printer. In particular, check the hexadecimal values for the following OCR-A separation characters (for information about how to do this, see [Defining Character Sets \[Page 302\]](#))

Hook	R/3 character ID 7.	⌞
Fork	R/3 character ID 8.	⌞
Chair	R/3 character ID 9.	⌞

Adding OCR Support

To maintain these special characters, choose  *Edit character set* on the character set maintenance screen. Using the information in your printer manual, enter the correct hexadecimal codes. *SAPscript* requires these characters for OCR-A printing.

Note: The character set must be suitable for all printing that you want to do with printers of this type:

It must contain the required OCR-A special characters.

The hexadecimal codes for other characters must be compatible with both the standard and OCR printer fonts.

In general, printer OCR character sets are identical to normal character sets except for the special OCR characters.

- Maintain the *SAPscript Printer font* specification for the *SAPscript* OCR-A or OCR-B font family, as appropriate. The printer font identifies the print control *SAPscript* is to use to switch the printer to the OCR character set.

On the *Spool Administration: Initial Screen*, choose *Environment* → *Font administration* and then *Printer fonts*. Find the device type for your printer and then define entries for Family **OCRA** and, if required, for **OCRB**.

- For both OCRA and OCRB, specify a *Size* of **120** and a *CPI* of **10**.
 - In *PrtCtl.1.* and *PrtCtl.2.* enter the print control names you want to use to activate OCR printing in portrait and landscape mode, respectively. The print control name must be of the form **SF<nnn>**. **<nnn>** can be any ID number you choose. Each print control name must be unique among those defined for the device type.
- Specify values for the OCR print controls you have just selected. The print controls activate the OCR character set. Choose *Tools* → *Spool* → *Spool administration* and then *Full administration* and then *Device types*. Select a device type, choose *Display* and then *Print controls*.

In the **SF<nnn>** print control, enter the printer command required to switch to the OCR character set or activate OCR printing. You can find these commands in your printer's OCR guide.

You must also maintain:

- Any other **SF<nnn>** print controls defined for the device type. These print controls are issued when OCR printing comes to an end and additional text is to be printed. Check each print control to ensure that it contains the correct printer command to reset the character set and font at the printer. Use the *SAPscript* printer font maintenance functions to determine which font is associated with which "SF" print control. The character set specification in the "SF" print controls must match the default character set in the device-type definition.
- Print controls **S4001**, **S4004**, and **S0000**. Save each of these print controls with an empty *Replacement text* field. (These print controls provide an alternate way to switch OCR printing on and off.)



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OCR Printing Using SWIN

The SWIN device type uses Windows formatting and Windows fonts for printing. To print OCR characters with SWIN, you therefore need to install an OCR-A font in Windows.

The SAP System provides an internal OCR font definition. To have this font printed out in the Windows font, you will need to set up a [Font Substitution \[Page 83\]](#) in the SAPIpd program. The substitution should convert the R/3 OCR font to the name of the Windows OCR font.

With device types other than OCR, you will probably need a font cartridge of soft fonts to print OCR characters.

For more information, see [Printing OCR Characters \[Page 139\]](#).



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Outputting Bar Codes

Using *SAPscript*, you can format data to print out as bar codes. Bar codes are often printed on labels to allow machine reading of data for such purposes as inventory of stock, transport, purchase, and so on.



Bar codes code data as a series of lines of varying thickness and/or distance from one another. Sometimes they include a check number, which is used for detecting and analyzing errors. Sometimes the bar code data is also repeated in human-readable numeric form.

Choose the following links for information about:

- The [Bar Codes \[Page 149\]](#) that have been predefined by SAP and which are ready for use
- The procedures for [Adding New Bar Codes \[Page 154\]](#) and enabling bar code printing on printers not predefined for bar code printing
- How to use the transfer program [SAPLPD on Windows Printers \[Page 160\]](#)

See also these useful SAP Notes on bar code printing:

SAP Note Number	Topic
45643	Bar code control sequences for the Hewlett-Packard LaserJet 4 JetCAPS Intelligent Bar code SIMM
35386	Printing bar codes under Windows NT
14561	BARCODE.DLL for SAPLPD bar code printing not found
5196	Printing bar codes with <i>SAPscript</i> (contents included in this documentation)



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Hardware/Software Requirements for Bar Code Printing

Hardware/Software Requirements for Bar Code Printing

Generally, printers need extra hardware or software to print bar codes. Many printers cannot print bar codes at all. Be sure to check that this feature is available before you acquire a printer.

Some printers are able to generate check numbers from the bar code data. For other models, you must provide the check numbers in the data that you send to the printer. If your printer cannot generate check numbers, then check the documentation of your R/3 applications to determine how to send the check number as part of the bar code data.



For information about the barcode.DLL for use in Microsoft Windows PCs, see [Bar Codes and SAPWIN \[Page 160\]](#) .



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Predefined Bar Codes

SAP has predefined the following bar codes on the following types of printers for you:

System Bar Code	Supported Device Types in the SAP spool system	Technical Bar Code Type
ARTNR: Article number	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 128
AUFNR: Request number	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 128
BARCLVS: Test bar code in LVS	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 39, no check digit
BC_93	KYOFF150, KYOFS170, HPLJ4, HPLJ5, HPLJ5SI, HPLJ4000	Code 93 (height: 13 mm, no plain text)
BC_C128B	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 128B (height: 13 mm, no text)
BC_CD39	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 39 (height: 1.3 mm, no text, no check digit)
BC_CD39C	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 39 (height: 1.3 mm, no text, with check digit)
BC_EAN8	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	EAN 8 (height: 13 mm, no text)

Predefined Bar Codes

BC_EAN13	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	EAN 13 (height: 13 mm, no text)
BC_EANH	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	For the Kyocera KYO* device types, Code 128. For the HPLJ4 device type, EAN 128. (height: 13 mm, no text)
BC_I25	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Interleaved 2of5 without checksum, (height: 13 mm, no text)
BC_I25C	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Interleaved 2of5 with checksum, (height: 13 mm, no text)
BC_MSI	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	MSI without checksum, (height: 13 mm, no text)
BC_MSIC	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	MSI with single mod-10 checksum, (height: 13 mm, no text)
BC_MSIC1	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	MSI mod-10 with mod-10 checksum, (height: 13 mm, no text)
BC_MSIC2	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	MSI mod-11 with mod-10 checksum, (height: 13 mm, no text)
BC_PSN5	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	For the Kyocera KYO* device types, United States Postal Service (USPS) Postnet. For the HPLJ4 device type, ZIP+4 POSTNET 5. (height: 3 mm, no text).

Predefined Bar Codes

BC_PSN9	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	For the Kyocera KYO* device types United States Postal Service (USPS) Postnet. For the HPLJ4 device type, ZIP+4 POSTNET 9. (height: 3 mm, no text).
C128A_00	Kyocera device types KYOFS150, 170; Hewlett-Packard device types HPLJ4, HPLJ5, HPLJ5SI, HPLJ4000	Code 128, character set A (height: 5 mm, no plain text)
C128A_01	KYOFS150, 170; HPLJ4, HPLJ5, HPLJ5SI, HPLJ4000	Code 128, character set A (height: 5 mm, no plain text)
C128B_00	KYOFS150, 170; HPLJ4, HPLJ5, HPLJ5SI, HPLJ4000	Code 128, character set B (height: 5 mm, no plain text)
C128B_01	KYOFS150, 170; HPLJ4, HPLJ5, HPLJ5SI, HPLJ4000	Code 128, character set B (height: 5 mm, no plain text)
CD39C_00	KYOFS150, 170; HPLJ4, HPLJ5, HPLJ5SI, HPLJ4000	Code 39 with checksum (height: 5 mm, no plain text)
CD39C_01	KYOFS150, 170; HPLJ4, HPLJ5, HPLJ5SI, HPLJ4000	Code 39 with checksum (height: 5 mm, no plain text)
CD39_00	KYOFS150, 170; HPLJ4, HPLJ5, HPLJ5SI, HPLJ4000	Code 39 without checksum
CD39_01	KYOFS150, 170; HPLJ4, HPLJ5, HPLJ5SI, HPLJ4000	Code 39 without checksum (height: 5 mm, no plain text)
KUNAUNR (sales order number)	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 128
KUNAUPS (sales order item)	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 128
MBBARC (test bar code - inventory management)	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 128
MBBARC1 (test bar code 1 - inventory management)	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	EAN 8

Predefined Bar Codes

RSNUM (reservation number)	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 128
RSNUM (reservation item)	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 128
RSNUM (confirmation number)	Kyocera device types KYOF1000, KYOF1200, KYOFS150; the Hewlett-Packard LaserJet 4 device type HPLJ4	Code 128

If you want to print with these bar codes on another type of printer or if you want to define another bar code, then you must add your own bar code definitions. For more information, see [Adding Your Own Bar Code Definitions \[Page 154\]](#).



For current information about predefined bar codes and supported printers, see SAP Note 5196.



For bar code printing on device type HPLJ4 (Hewlett-Packard LaserJet 4 (PCL-4/5 printer language), you must have the JetCAPS Intelligent Bar code SIMM board for your printer. You can obtain this SIMM card from Hewlett-Packard. R/3 supports only this bar code SIMM module for HPLJ4 printers. See also SAP Note 5196 for supplier information. Note that the HPL2 printer driver automatically restores the font in use before the bar code printing occurred. To do this, the driver issues the appropriate SF<nnn> print control.



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Testing Bar Code Printing

To test bar code printing, do the following:

1. On the *Spool Administration: Initial Screen* (transaction SPAD) choose *Utilities* → *For device types* → *Test data (SAPscript)*.
2. Print the predefined document **SAPSCRIPT-BARCODETEST**, specifying **ST** as the document ID and **DE** or **EN** as the language.

If you want to test rotated bar code printing, choose **SAPSCRIPT-BARCODETEST2**.

The document prints the most important bar codes predefined by SAP (see [Predefined Bar Codes \[Page 149\]](#) for additional information). The document is usually only available in client 000.



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Adding Your Own Bar Code Definitions

Adding Your Own Bar Code Definitions

If you want to:

- Add a new bar code
- Use a predefined bar code on a printer other than those listed in [Predefined Bar Codes \[Page 149\]](#)

you must define the bar code in the SAP spool system and in *SAPscript*. Specifically, you must define the following:

- The bar code in *SAPscript*, if it is not one of the standard, predefined R/3 bar codes. This is the system bar code definition.
- The names of the print controls for turning bar code printing on and off. This is the printer bar code definition.
- The printer escape sequences with which bar codes are turned on and off. These are the values for the print controls for turning a bar code on and off.

To define a bar code and activate bar code printing, do the following:

1. Define the [Bar Codes in SAPscript \[Page 156\]](#), if not already defined.
2. [Copy the device type definition of the printer \[Page 254\]](#) with which you are working. You can skip this step if you are adding a new type of printer to the SAP System.

Use the new device type in all of the printer definitions that you set up for printing with bar codes.



You want to print bar codes on a Hewlett-Packard LaserJet 4 printer. This printer is predefined by SAP with device type HPLJ4. However, the standard printer definition does not include support for printing bar codes.

You need to create a copy of the device type, such as ZHPLJ4.

You need to add the print controls for turning off bar code printing to printer type ZHPLJ4, not to the standard HPLJ4 definition. You also need to use ZHPLJ4 as the device type in all of the Hewlett-Packard LaserJet 4 printers you define for printing bar codes in the SAP System.

3. [Define the printer bar codes \[Page 157\]](#) for the system bar codes you intend to use.
4. Enter the escape sequences (printer commands) for bar code printing in the print controls you have defined.

Choose *Tools* → *CCMS* → *Spool* → *Spool administration* and then *Full administration*. Choose the *DeviceTypes* tab page, enter the name of the device type and confirm your entry.

Choose  *Print controls* and enter the required printer commands to start and stop bar code printing. For information about which commands to enter, see the documentation provided with your bar code printing system.

Adding Your Own Bar Code Definitions

Example: For SBP25 (from step 2), you would enter the escape sequence that switches the printer into bar code mode. For SBS25, you would enter the sequence that switches off bar code mode.



See [Adapting Bar Code Print Controls \[Page 159\]](#) before you define your bar code print controls. The R/3 printer drivers handle the marking of bar code data differently, and this affects the escape sequences you must enter in your print controls.



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Creating System Bar Codes

Creating System Bar Codes

To add a bar code in SAPscript, do the following.

Procedure

1. Choose *Utilities* → *SAPscript* → *Administration* → *Font* (transaction SE73).
2. Select *System bar codes* and then *Change*.
3. Choose *Create* to define a new bar code. Note the following information:
 - *Bar code*: Enter the name of your new bar code. The name must begin with a **Z** to avoid conflicts between your bar codes and the SAP System bar codes.
 - *Bar code type*: Choose one of the bar code types listed. This is currently for information purposes only.
 - *Rotation at output*: Enter how many degrees your bar code should be rotated at output.

Result

Once you have created a system bar code, continue with step 2, [Copying Device Types \[Page 254\]](#) .



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Defining Printer Bar Codes

Use

A *Printer bar code* specifies the name of the print controls that are used to turn bar code printing on and off. You must define bar code print controls for each printer type that you want to use for bar code printing.

Prerequisites

Ensure that the system bar code for your printer bar code already exists, or create a new system bar code, see [Creating System Bar Codes \[Page 156\]](#) . Define the new printer bar code only for the copy of an original device type.

Procedure

1. Choose *Tools* → *SAPscript* → *Administration* → *Font* (transaction **SE73**).
2. Select *Printer bar codes* and choose *Change*.
3. Choose your new device type.
4. Choose *Create* to define a new printer bar code.
Enter the following information:

- *Bar code*: The name of the system bar code that you want to print.
- *Prefix*: The name of a print control in the form **SBP<nn>**. **<nn>** is an ID number.

You can select any identification number you want. The print control name must be unique among the print controls that have been defined for the device type.

Example: SBP25

- *Suffix*: The name of a print control in the form **SBS<nn>**. **<nn>** is an ID number.

You can select any identification number you want. The print control name must be unique among the print controls that have been defined for the device type. You should use the same identification number for both *Prefix* and *Suffix*.

Example: SBS25

Result

Once you have created a printer bar code, you can continue with step 4, [Specifying Printer Commands in the Print Controls \[Page 154\]](#).



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Defining Printer Bar Codes

Adapting Bar Code Print Controls to SAPscript Printer Drivers

The printer drivers provided by SAPscript format bar code data for printing in different ways. Check the following notes to be sure that you have defined your bar code print controls correctly:

- The PRES printer driver for Kyocera laser printers with the programming language PRESCRIBE automatically puts single quotes ' around the data string of a bar code. You should therefore not include single quotes in the SBS<nn>/SBP<nn> print control for a Kyocera printer.



For a Kyocera F1200 printer, the bar code print control definitions could be as follows:

SBP01 (bar code prefix): **BARC 15,N,**

SBS01 (bar code suffix): ;

After print control SBP01 appears in the text, the PRES driver automatically places single quotation marks around the text that follows, as required for the BARC command in the PRESCRIBE printer language. If the bar code data is 123456789, then PRES sends the following output stream to the printer:

```
BARC 15,N,'0123456789';
```

- The POST driver for PostScript printers (for example, device type POST2) automatically puts the data for a bar code in parentheses. You should therefore not enter parentheses in your definitions of the bar code print controls. (The parentheses mark the data as a PostScript string.)
- The drivers STND, STN2, HPL2 send the bar code data "as is" to the printer. You must therefore provide for any formatting conventions required for bar code printing in your print control definitions.



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Bar Codes and SWIN

Bar Codes and SWIN

To print bar codes on any Windows printer, do the following:

1. Define the printer in the R/3 spool system with device type SWIN.
2. Specify *Access method S* in the printer definition in the spool system.
3. Install a *.DLL file on your Windows PC.

SAP does not offer a bar code.DLL. You must obtain the.DLL from another vendor.

These *.DLLs convert bar codes to graphics. Any printer that can print graphics can therefore print the bar codes, and no font cartridge is required.

The bar code.DLL must meet the following requirements:

- It must be compatible with your Windows printers and with the R/3 SAPLPD transfer program running on the Windows PC.

To be compatible with SAPLPD, the bar code.DLL must offer a programming interface that meets SAPLPD's requirements. These interface requirements and known compatible products are documented in SAP Note 25344. You can view the interface requirements as of the time of this writing in [Bar Code.DLL Compatibility With SAPLPD \[Page 161\]](#).

- The.DLL must be named BARCODE.DLL.
- The.DLL must be located in one of these directories:
 - The winnt directory
 - The directory in which SAPLPD.EXE resides.

SAPLPD does not use the PATH variable to find the BARCODE.DLL.



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BarCode.DLL Compatibility With SAPlpd

To assure compatibility with the R/3 SAPlpd program, the barcode.DLL vendor must verify that the following are true:

- The bar code functionality is implemented as a.DLL
- The bar code can be configured by means of specifications in the data record (see the interface requirements below)
- The barcode.DLL can calculate check digits and legends
- Both bar code width and total size can be scaled.

Any barcode.DLL that offers the following two functions should be compatible with SAPlpd (also see SAP Note 25344 for descriptions of the parameters in the function calls):

```
bool BarcodeInit(far char * buff, int buflen)

/* SAPlpd calls this function when SAPlpd starts. The
parameter buff points to a buffer in SAPlpd of length
buflen. The barcode.DLL puts a string in this buffer which
is output by SAPlpd in its log window.
The string identifies
the bar code.DLL: name, manufacturer, version.
Return TRUE if OK. */

int Bar codePrint( HDC * hPr, bar code * bc_ptr)

/* This function is called by SAPlpd to print a bar code. The
hPr parameter contains the GDI device context for the output
device. The parameter bc_ptr points to a control block which
contains the information about the bar code.

Return code 0:      execution successful
Return code <> 0:  An error occurred. In this case, the
pointer errmsg in the control block must be set accordingly.

The control block must contain the following fields: */

short protovers /* Log version used. Set to 3 by
                SAPlpd. */
int xpos;      /* Start position. Set to the current
int ypos;      cursor of SAPlpd.
                Output of the
                bar code begins here.*/
int hsize;     /* Required size of bar code. -1 sets
int vsize;     to standard size. */
char far * str; /* Data */
int stlength;
int check;     /* Compute checksum:
                0: no checksum
                1: with checksum
                -1: Accept standard bar code
```

BarCode.DLL Compatibility With SAPlpd

```

                                settings */
int label;                       /* label Bar code */
int fontsize;                     /* Font size and pitch
int hspacing;                     (specified according to current
                                map mode) */
int codeid = {                   /* which bar code? */
    BC25INDU,                      2 of 5 industrial
    BC25MATRIX,                    2 of 5 matrix
    BC25INTER,                     2 of 5 interleave
    BCCODABAR                      Codabar
    BCCODE39,                      Code 39
    BCCODE39EXT,                  Code 39 Extended
    BCCODE93,                     Code 93
    BCCODE93EXT,                 Code 93 Extended
    BCCODE128B,                  Code 128 Subset B
    BCEAN8,                       EAN 8
    BCEAN8P2,                     EAN 8 + 2
                                characters
    BCEAN8P5,                     EAN 8 + 5
                                characters
    BCEAN13,                      EAN 13
    BCEAN13P2,                    EAN 13 + 2
    BCEAN13P5,                    EAN 13 + 5
    BCUPCA                        UPC A
    BCUPCAP2                      UPC A + 2
    BCUPCAP5                      UPC A + 5
    BCUPCD1                      UPC D-1
    BCUPCD2                      UPC D-2
    BCUPCD3                      UPC D-3
    BCUPCD4                      UPC D-4
    BCUPCD5                      UPC D-5
    BCUPCE,                      UPC-E
    BCUPCEP2,                    UPC-E + 2
    BCUPCEP5,                    UPC-E + 5
    0                             Accept bar code
                                default};
int scale_s1;                    /* Scaling information about stripe widths
int scale_s2;                    and vertical line spacing.
int scale_s3;
int scale_s4;
int scale_l1;
int scale_l2;
int scale_l3;
int scale_l4;

char far * errmsg; /* Possible error message */

```



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Printing Labels

Printing Labels

Use

You want to print labels (for example, shipping labels or barcode labels) on a special printer. Release 4.6A allows you to create labels using an external design program and to print them from within a SAPscript form.

Prerequisites

Nearly all special label printers on the market use individual control languages, for which no printer drivers exist in the SAP Standard. To be able to address these label printers from within the R/3 system nevertheless, you use an external program to define the entire layout.

Activities

1. **Create the label using a design program:** Define the entire layout of the label, including the fields you later want to fill from within the R/3 system.
2. **Download the print file:** Export the data using the printer commands of the design program. The printer commands must be in ASCII format, that is, you can use only printable characters plus carriage return, line feed, and, maybe, form feed. In addition, the file must not comprise more than 80 characters per line; otherwise unwanted line feeds may occur during upload. There must be no binary control characters (for example, escape).
3. **Upload the print file into the SAPscript form:** Upload the print file into a SAPscript standard text. However, you use this standard text as "intermediate storage" only. Then copy the text into a SAPscript form. In the form, enter variables of the print program (program symbols) in those places where you want variable data to appear in the label. At runtime, the system fills these variables with the current field values from the application program.
4. **Adapt the form:** For most label printers you must adapt the form; for example, you must enlarge the MAIN window to maximum page size and delete all other windows. In addition, the MAIN window should contain only one single text element: the imported print file.
5. **Create an output device:** Define an output device for label printing. As device type use either ASCIIIPRI or one of the special device types for label printers.



The subsequent topics tell you how to create labels for the individual printer types and how to print them from within SAPscript.

- [Printing Labels With Avery TTX 450 \[Page 166\]](#)
- [Printing Labels With CAB Apollo 2 \[Page 168\]](#)
- [Printing Labels With Intermec Easycoder 501 XP \[Ext.\]](#)
- [Printing Labels With Intermec Easycoder 4420 \[Ext.\]](#)
- [Printing Labels With Printronix T 3204 \[Page 170\]](#)
- [Printing Labels With SATO CL408 \[Ext.\]](#)
- [Printing Labels With Zebra Z4000 \[Ext.\]](#)

Printing Labels With Avery TTX 450

Use

This topic tells you how to use the method described under [Printing Labels \[Page 164\]](#) to create and print labels with the TTX 450 of Avery-Dennison.

Procedure

1. **Create the label:** Use the design program *Jetmark 32* of Avery Dennison to create the label layout. This program runs under Windows 95/98 and under Windows NT. As printer select the Avery printer *TTX 450 12 dpmm* in *Jetmark 32*.
2. **Define the R/3 form fields:** In *Jetmark 32*, define all those fields as "normal" input fields with constant text (not as database variables) that will later be filled with variable data from the R/3 system. Into each field enter the field name that will later be used in R/3 (for example, **VBAK-KUNNR**) as plain text; this allows you to easily find the field in the print file created by the download. To "simulate" the size the field will have later, you can extend the field name to the desired size by adding any characters (for example, **VBAK-KUNNRXXXXXX**).

In some barcode fields, you cannot enter field names but only characters corresponding to the barcode type (for example, only digits). In this case, use a text constant that corresponds to the input data (for example, 01234567 for an 8-digit numeric barcode field).

3. **Select fonts for text fields:** For text fields with variable contents you can use only printer-internal fonts. For text fields with constant contents you can use either printer-internal fonts or TrueType fonts. During download, constant texts with TrueType fonts are transformed into bit patterns and stored in the print file, which enlarges them.
4. **Insert bitmap graphics:** You can include bitmap graphics (for example, company logos) into the label definition; during download, they are inserted into the print file. However, transform any colored bitmaps into black-and-white bitmaps before importing them into *Jetmark 32*.
5. **Download the label definition into the print file:** In *Jetmark 32* choose *File* → *Print* to transfer the printer commands in a print file. Select the field *Print in file* and enter path and file names for the file to be created. You can use *Settings* to set options such as "cutting the label at the end of the job" or "Blank label and cutting at the end of the job".
6. **Upload the print file into SAPscript and insert the variables:** Start the SAPscript standard text editor (*Utilities* → *SAPscript* → *Standard text*). Create a new standard text. Upload the label file using function *Text* → *Upload*. As format choose **ASCII**. Save the file.

In the text, search for the variable fields you defined under 2.). Replace the constant text you entered there (for example, **VBAK-KUNNR**) with the name of the actual variable as it is used by the print program of the application (for example, **&VBAK-KUNNR&**). In the editor choose *Edit* → *Command* → *Insert command* to insert SAPscript variables (program symbols).

7. **Adapt the SAPscript form:** To print the label, adapt the SAPscript form you want to use. Choose *Utilities* → *SAPscript* → *Form*:
 - Copy the standard text that contains the print file into a text element of the MAIN window. The name of this text element depends on the R/3 application program you use.

Printing Labels With Avery TTX 450

- The first page of the form should point to itself as next page, since the label file in the MAIN window may be very large, especially if graphics are included.



Since Avery printers ignore any unknown commands in the print data stream, it is not necessary to execute the actions described below. However, they make the form clearer and easier to use:

- Delete all windows except MAIN. If you keep any windows, they must not contain any data you want to print (you may mark texts as comments).
 - The MAIN window should contain only one text element, which contains the label file you just created.
 - If there are any other text elements defined in MAIN that are called from within the print program, mark their contents as comments.
8. **Create an output device:** Define the Avery printer as [Output Device in the SAP System \[Page 49\]](#).

The easiest way is to connect the printer to a Windows PC, install any Windows printer driver there, and start the output program SAPIpd. Then define the printer in the spool administration (transaction SPAD) using coupling type "S" or "U".

As device type select **LB_AVE**.

Printing Labels With CAB Apollo 2

Printing Labels With CAB Apollo 2

This topic tells you how to use the method described under [Printing Labels \[Page 164\]](#) to create and print labels with the printer Apollo 2 of the manufacturer CAB GmbH. According to CAB, you can use the same procedure for the printer models Apollo 1, Apollo 3, Apollo 4, and for the fully automatic labelling system "CAB Hermes 4" as well.

Procedure

1. **Create the label:** To design the label layout, use the design program *Easylabel* of the manufacturer Tharo Systems, Inc. This program runs under Windows 3.1, Windows 95, and Windows NT. As printer in *Easylabel* select CAB Apollo 2.



For technical reasons, you can use the CAB printer from within SAPscript only if you previously stored the label definition in the printer (on memory card) and then transfer from within SAPscript only the field contents of the variable label fields. To be able to use this method, each printer must be equipped with a memory card.

2. **Define the R/3 form fields:** In *Easylabel* define all those fields as type *FIX* (not as database fields) that will later be filled with variable data from the R/3 system. As field contents select sample data that allows you to estimate the space needed for the field contents. To load the label definition onto the memory card of the printer at a later time, each variable field must have a field name in *Easylabel*. The field names in *Easylabel* can be up to 10 characters long and alphanumeric. Therefore, you cannot use R/3 field names directly. Instead, use neutral field names such as **T1** for the first, **T2** for the second text field, **B1** for the first barcode field, and so on.
3. **Select fonts for the text fields:** For text fields, you can use either printer-internal or TrueType fonts. Since the label definition is stored together with the fonts on a memory card in the printer, the font selected does not influence the size of the print file created by R/3.
4. **Insert bitmap graphics:** Bitmap graphics are also stored on the memory card.
5. **Transfer the label definition to the memory card:** To transfer the label definition to the memory card installed in the printer, choose *Print a batch of formats*, load the stored label, and execute the function *Download format to memory card*. Enter the name of the label, which may be up to eight characters long. This name is used later to identify the label definition.



Set the parameter *Quantity* to the value *Printer prompts for quantity*, otherwise the printer will always print one label with the current data and, additionally, one original label.

Besides the label definition downloaded to the printer, *Easylabel* creates a file of type "[filename].rpl" on the PC. Usually, you find this file in the installation directory of *Easylabel* on the PC. This RPL file is the basis for the print file to be sent from R/3, which passes values for the variable fields of the label and finally prints the label.

6. **Upload the RPL file into SAPscript and insert the variables:** Start the SAPscript standard text editor (*Utilities* → *SAPscript* → *Standard text*). Create a new standard text. Upload the RPL file using function *Text* → *Upload*. As format select **ASCII**. Save the file.

For each variable field to which you assigned a field name in *Easylabel* under 2.), the file contains a line R XX, where XX is the field name (for example, **R T1 ;**). After the

Printing Labels With CAB Apollo 2

semicolon enter the program variable from the print program of the application, whose value you want to print in this field (for example, `R T1;&VBAK-KUNNR&`). In the editor choose *Edit* → *Command* → *Insert command* to insert SAPscript variables (program symbols).

7. **Adapt the SAPscript form:** To print the label, adapt the SAPscript form you want to use for printing. Choose *Utilities* → *SAPscript* → *Form*:
 - The MAIN window must cover the entire page format (for example, DINA4), which means that there may not be an upper or left margin between MAIN and the page margin.
 - The MAIN window should contain only one text element which contains the newly created RPL file. The name of the text element depends on the R/3 application program you use. Insert the RPL file into this text element by copying the entire text from SO10 into the form window.
 - If there are any other text elements defined in MAIN that are called from within the print program, mark their contents as comments.
 - Delete all windows except MAIN. If you keep any windows, they must not contain any data you want to print (you may mark texts as comments).
 - The first page of the form should point to itself as next page, since the label file in the MAIN window may be very large.
8. **Create an output device:** Define the CAB printer as [Output Device in the SAP System \[Page 49\]](#).

The easiest way is to connect the printer to a Windows PC, install any Windows printer driver there, and start the output program SAPIpd. Then define the printer in the spool administration (transaction SPAD) using coupling type "S" or "U".

As device type select `LB_CAB`.

Printing Labels With Printronix T 3204

Printing Labels With Printronix T 3204

This section explains the procedure described in [Printing Labels \[Page 164\]](#) to create and print labels using the printer Printronix T3204.

Procedure

1. **Creating the label:** Use the design program *Codesoft Pro 4.20* by Techniques Avancées to create the label layout. You can run this program under Windows 3.1, Windows 95, and Windows NT. As printer choose within *Codesoft: Printronix T 3204 (PGL)*.



Define the printer within *Codesoft* with output port *FILE* to be able to load the print data into a file at a later time.

When defining the output format, deactivate the option *Automatically adapt size*. To do this, choose *File* → *Format* → *Page*.

2. **Defining the R/3 form fields:** Define all fields, which R/3 later fills with variable data, as fields with constant values, not as database fields. As field contents, use the R/3 field name. If this is not possible – for example, for certain barcodes – enter a combination of numbers which you can easily find in the print file.



If the field contents exceeds the printable area of the defined output format, the printer T 3204 shows an error message and does not print the label. Therefore, make sure that the contents of a completely filled output field still fits into the defined label. If necessary, enhance the R/3 field names (for example, **VBAK-KUNNR**) with additional characters to ensure output of a variable in its maximum length.

3. **Selecting the fonts for text fields:** For text fields, use only printer-internal fonts of the Printronix printer, no TrueType fonts.
4. **Inserting bitmap graphics:** You cannot include bitmap graphics into the label definition. During download they are converted into binary data which cannot be interpreted by SAPscript.
5. **Downloading the label definition into the file:** To transfer the printer commands to a file, choose *File* → *Print*. Select the printer with output port *FILE* and choose *Print*. Enter a name for the print file.
6. **Uploading the label file into SAPscript and inserting the variables:** Start the SAPscript standard text editor (*Utilities* → *SAPscript* → *Standard text*). Create a new standard text. Choose *Text* → *Upload* to upload the print file. As format select **ASCII**. Save the file.

Search for the variable fields and replace the constant text there (for example, **VBAK-KUNNR**) with the variable actually used in the print program (for example, **&VBAK-KUNNR&**). To do this, choose *Edit* → *Command* → *Insert command* and specify the variable in the field *Symbols*.

7. **Adapting the SAPscript form:** To print the label, adapt the desired SAPscript form. Choose *Utilities* → *SAPscript* → *Form*:
 - Define the first page of the form as its own next page, since the label file in the MAIN window may be very large.

Printing Labels With Printronix T 3204

- The MAIN window should contain only one text element which contains the label file. The name of this text element depends on the R/3 application program used. To insert the label file into this text element, copy the entire text from the standard text editor into the form window.

The modifications described below are not mandatory, since the printer language Printronix PGL ignores any unknown commands and leading blanks or blank lines are no problem. However, for better readability, you should make the following changes to the form:

- Delete all windows except MAIN, or make sure that these windows don not contain any data to be printed (make them comments).
- If the print program calls any other text elements in MAIN, change their contents to comments.

8. **Creating an output device:** Define the Printronix printer as [Output Device in the SAP System \[Page 49\]](#).

The easiest way is to connect the printer to a Windows PC, install any Windows printer driver there and start the output program SAPIpd. The define the printer in the spool administration (transaction SPAD) using coupling type "S" or "U".

As device type choose `LB_PRI`.

Configuring a Printer for Use with the SAP System

Configuring a Printer for Use with the SAP System

This section describes how to set up specific types of printers at the operating system level so that they will work with the predefined output device type definitions provided by SAP in the SAP spool system. Each printer description in this section:

- Names the standard device type definition SAP has provided with the SAP System. Use this device type definition to define the printer in the SAP spool system.
- Describes the configuration SAP used in a successful test of the printer and notes any special configuration settings that had to be made.

The specifications in this section:

- Are based upon tests performed by SAP, by SAP's partners, or upon specifications provided by the printer manufacturer.
- Assume you are connecting the printer to a UNIX host system. You may need to alter some settings if the printer is to be connected to another type of host.

You can change printer configuration settings at the printer's control panel, by using the configuration software provided with the printer, or by sending escape sequences to the printer when it is turned on and initialized. The possibilities vary from printer to printer. If you prefer making changes with escape sequences when you initialize a printer, you can use the SAP device type format to send the escape sequences to the printer. If you have questions about how to make a particular change to the configuration of your printer, see the printer manual.



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Setting Up a Generic ASCII Printer

If you are setting up a type of printer that has not been defined to the SAP System, then you can test the printer from the SAP System with the R/3 output device type ASCIIIPRI. ASCIIIPRI uses the STN2 printer driver for printing from the *SAPscript* text processing system.. ASCIIIPRI contains all necessary (empty) definitions to operate the printer temporarily in test mode, provided that the printer understands "pure" ASCII texts (that is, it prints the normal ASCII (American) character set.

The definitions are:

- Name of the printer type, *SAPscript* driver, and printer character set (transaction SPAD)
- Print controls (SPAD)
- Spool formatting types (SPAD)
- *SAPscript* printer fonts (SE73)

The printer must also understand the following spool commands:

- Carriage return (carriage return, hex \$0D)
- Linefeed (line feed, hex \$0A)
- Formfeed (form feed, hex \$0C)

You can use ASCIIIPRI as a last resort for a printer that is not working with the SAP System or as a reference for defining a new type of output device.

You can set up an ASCIIIPRI printer simply by naming the printer in the spool administration function. If you want to use ASCIIIPRI as the basis for a new output device type, be sure to copy ASCIIIPRI to a new device type first.

Be sure to set the printer to a pitch of 10 CPI (characters per inch) and a line spacing of 6 lines per inch. These settings assure proper text alignment when printing *SAPscript*.

Formatting changes have no effect, as no font or printer pitch changes are sent from the SAP spool system to the printer.



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Setting Up a Compuprint 970 or 4/6x

Setting Up a Compuprint 970 or 4/6x

The Compuprint 4/6x is an 18-pin dot matrix printer with serial and parallel interfaces. The printer type COMPU960 is used for printing from R/3. The driver STN2 is set for printing from the SAPscript word processing system.

The printer definition requires that the printer be operated in the EPSON mode. You can set this on the printer control panel. The printer type COMPU960 specifies its own printer code page (character set) 1119. This character set also contains other European special characters in addition to the German umlauts.

The Compuprint 970 and 1070 printers are more advanced models that also work with the COMPU960 device type. The SIGNUM 2076 and Compuprint 9068 18-pin dot matrix printers should also work with this device type, as they support the same EPSON emulation.

Configuration Notes

The emulation mode must be set to EPSON. As the 4/6x printers do not offer a control sequence for setting the line mode, the printer device format therefore also contains no escape sequence for setting the line mode. You must therefore make this specification by hand at the printer control panel.

The following information was kindly provided by the manufacturer.

DC4 DC4 ESC T n	COMPUP RINT	Select / Load or Parks the Fanfold from the LowerTractor Paper Path. 0 $\leq n \leq 1$	14 14 1B 54	20 20 27 84	
		n	Selection		
		0	Selects and loads fanfold from the lower tractor paper path. If the paper (single sheets or fanfold) present is loaded in other media, the printer ejects automatically the cut sheet or parks the fanfold that is not requested before loading the new one.		
	1	Parks the fanfold loaded from the lower tractor paper path after having pressed PARK in response to the PARK:SURE? message.			
DC4 DC4 ESC Y n	COMPUP RINT	Select Printer Emulation	14 14 1B 59	20 20 27 89	
		n	Printer Emulation		
		1	EPSON FX 1050		
		2	IBM Proprinter XLIII		
	5	IBM 2381			

Setting Up a Compuprint 970 or 4/6x

DC4 DC4 ESC Z n	COMPUP RINT	Make AGA in column. Selects the column at 10 cpi where the Automatic Gap Adjustment (AGA) will be made. The n parameter is the column number. Select the user macros $0 \leq n \leq 4$	14 14 1B 5A	20 20 27 90
DC4 DC4 ESC u n	COMPUP RINT	select the user macros $0 \leq n \leq 4$	14 14 1B 75	20 20 27 117
		n		
		1	Selects User Macro 1	
		2	Selects User Macro 2	
3	Selects User Macro 3			
4	Selects User Macro 4			



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Setting Up a C.ITOH CI-1000/CI-500 Printer

Setting Up a C.ITOH CI-1000/CI-500 Printer

The C.ITOH CI-1000 printer is a line printer with serial and parallel interfaces. It offers the emulations CI-DLP, IBM Proprinter II/XL and Printronix P6000-P/P6000-S. The CIP1000 output device type is used for printing from the SAP System. CIP1000 uses the IBM Proprinter II/XL emulation with the IBM 2 character set.

For printing from *SAPscript*, the standard driver II (STN2) is used. Because printing is much slower when the spacing within a line is changed, only one font size and CPI size is maintained for printing from *SAPscript* (COURIER 12 pt., 10 CPI). For printing SAP list output, different CPI sizes are used depending upon the print format.

Compatible Printer Models

You can use the CIP1000 device type with the following C.ITOH printers: CI-500, CI-300/CI600 and CI-400/CI-800. According to the manufacturer, these are compatible with CI-1000.

Printer Configuration Settings for CIP1000

You should make the following configuration changes to the CI-1000 to work with device type CIP1000:

Option	Setting
001 EMULATION MODE	IBM PRO
002 SETTING MEMORY CONTROL	ENABLE
016 PRINT WIDTH	136 COL
019 WRAPAROUND	TRUNCATE
035 CHANGE TOF BY FORM LENGTH	CHANGE
040 RESPONSE TO ESC SEQUENCE	ALL ESC
041 CODE SYSTEM	CI STD



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Setting Up a Digital Equipment LN07, DEClaser1100, or DEClaser22

Setting Up a Digital Equipment LN07, DEClaser1100, or DEClaser22

The Digital Equipment LN07, DEClaser 1100 and DEClaser 2200 are laser printers with serial and parallel interfaces. For printing from the SAP System, you can use the device type DECLN07 for all of these printers, since the printers are generally compatible to one another. DECLN07 uses the STN2 driver for printing from the SAP*script* word processing system.

Configuration Notes

All of the printers can be equipped with a PostScript data cartridge. You can switch between Digital Equipment PPL2 mode and PostScript manually at the control panel (see the documentation on the PostScript cartridge). The printer displays the current mode with "DEC" for Digital Equipment PPL2 and "Pscript" or a similar string for PostScript mode.



The printer type DECLN07 only controls the printer in DEC mode, not in PostScript mode. Printing from R/3 with the printer type DECLN07 works with plugged-in PostScript cartridge thus only, if the printer is in the DEC mode.

The default settings for a printer that is connected through a serial interface are shown in the table below. You can display these settings by printing out the status sheet of the printer (press TEST/FONT once with the printer offline). The first column displays the English names of the configuration menus. You can choose among these menus at the printer control panel.

Menu	Option and Setting
FEEDER	feeder=Tray
LAYOUT	autoNL=ON
COPY	copy=01
COMMAND	message=English
INITIAL	macro=000
	paint=partial
	paper=A4
INTERFACE	i/f=RS232C
	baud=4800
	rsmode=8S
	dtr=Fix-H
	xon/xoff=ON
	etx/ack=OFF

The INTERFACE settings are especially important for the correct functioning of your printer. These options have the following meanings:

Setting Up a Digital Equipment LN07, DEClaser1100, or DEClaser22

- The parameter "i/f" selects parallel or serial interface.
- The parameter "baud" selects the baud rate (only for the serial interface).
- The parameter "rsmode" selects 7/8 bits, parity, stop bits (Only for the serial interface. Also see your printer manual).
- According to the printer manual, the parameter "dtr" must always be set to Fix-H when connecting to Digital Equipment machines (only with the serial interface – check this setting yourself to be sure that this information is current).
- The parameter "xon/xoff" switches on and off the XON/XOFF handshaking protocol.
- According to the printer manual the parameter "etc/ack" must always be set to OFF when connecting to Digital Equipment machines (only with the serial interface – check this setting yourself to be sure that this information is current).



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Setting Up a Digital Equipment LA75Plus

The Digital Equipment LA75Plus is a 24 pin-dot-matrix printer with serial and parallel interface. Use device type DECLA75P to print on the printer from the R/3 System. DECLA75P uses the STN2 driver for printing from SAP*script* word processing.

Configuration Notes

You can print out the configuration settings of the printer by pressing SETUP when you turn on the printer. Use this print out to check your configuration changes.

The LA75P can run under several protocols including IBM Proprinter emulation and the Digital Equipment PPL2 mode. You can switch between protocols with the PROTOCOL button on the printer control panel. If you select Digital Equipment, the LED labeled "DEC" lights up.

DECLA75P uses the printer only in Digital Equipment mode and includes an escape sequence for switching the printer from IBM Proprinter to Digital Equipment mode.

The following printer parameters are especially important for the correct functioning of your printer:

- Generic 6: Port Selection: Selects parallel/serial interface or automatic switching between both.
- Generic 7: Baud Rate (only with the serial interface).
- Generic 8: Data bits and Parity: (only with the serial interface).
- Generic 9: Buffer Control: XON/XOFF (handshake, only with the serial interface).

Setting Up a Hewlett-Packard HP256x Printer

Setting Up a Hewlett-Packard HP256x Printer

The Hewlett-Packard HP256... series (for example, HP2564B) are high capacity line printers.

The SAP System uses the HP256X device type for these printers. HP256X is based upon the printer documentation and supports only character pitch and line-spacing settings that are available on all of the printers. Pitch settings 10 CPI and 16.7 CPI are supported; 12 CPI is not available on all models and has not been implemented in the device-type definition.

HP256X uses the STN2 driver for printing from *SAPscript* word processing. Only one font could be implemented for *SAPscript* output. Boldface printing in list output from the SAP System is also not supported in the device type (print controls SABL and SAOFF contain no escape sequences).



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Setting Up a Hewlett-Packard HP2930, HP2934

The Hewlett-Packard HP2930 (or HP2934, a similar model) is a high capacity line printer.

The SAP System uses device type HP2930 for these printers. HP2930 uses the STN2 for output from the *SAPscript* word processing system. Only one font could be implemented for *SAPscript* output. Boldface printing in list output from the SAP System is also not supported (print controls SABL and SAOFF contain no escape sequences).



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Setting Up a Hewlett-Packard LaserJet II

Setting Up a Hewlett-Packard LaserJet II

The LaserJet II is a laser printer with serial and parallel interfaces. Use the HPLJ_II device type for this printer. HPLJ_II uses the HPL2 printer driver for output from *SAPscript* word processing. The printer is driven using the printer programming language HP-PCL for both *SAPscript* and R/3 list output.

Configuration Notes

You must manually set the printer at the control panel to the paper size required by the R/3 output (DINA4, LETTER, LEGAL, EXECUTIVE). If the setting is not correct, the printer displays a message, such as "PAPER SIZE LETTER" if LETTER output is coming from the SAP System but the printer is set to DINA4. You can force the printer to print out on the paper currently set by pressing the CONTINUE key.

HPLJ_II uses only the built-in typefaces of the LaserJet II series.

You can use HPLJ_II with LaserJet III printers. In this case, proportional typefaces (HELVE, TIMES) are not available, because only the III series has built-in proportional typefaces.



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Setting Up HP LaserJet IIIP, III, IIID, or IIISi

The Hewlett-Packard LaserJet III, IIIP, IIID, and IIISi are laser printers with serial and parallel interfaces.

Use the HPLJIIID device type for these printers.

HPLJIIID uses the HPL2 printer driver for *SAPscript* word-processing output. The printer uses the HP-PCL printer programming language for both *SAPscript* and R/3 list output.

Configuration Notes

You must manually set the paper size required by the R/3 output (DINA4, LETTER, LEGAL, EXECUTIVE) at the printer control panel. The printer will display an error message if there is a problem with the setting. If, for instance, you are using LETTER size paper but the printer is set to DINA4 paper, the printer will display the message "PAPER SIZE LETTER". You can force the printer to print out on the paper currently set by pressing the CONTINUE key. Be sure that the paper cassette also contains the correct size paper (if the printer has a cassette).

Printer type HPLJIIID supports the OCR-A typeface as implemented in the font cartridge "Bar Codes & More" from Hewlett-Packard.

Using PostScript cassettes: In general, you should not plug a PostScript cartridge into a printer that you are addressing with device type HPLJIIID. However, using newer Hewlett-Packard PostScript cartridges, you can switch the printer to PCL mode with the PostScript cartridge installed and still use the HPLJIIID device type. At the time of this writing, there were two versions of the Hewlett-Packard PostScript data cartridge: An older type (name: "Hewlett-Packard PostScript Cartridge") and a newer cartridge (name: "Hewlett-Packard PostScript Plus Cartridge"). The older cartridge converts the HPLaserJet into a pure PostScript printer. The printer then no longer understands the PCL programming language and cannot be addressed from the SAP System using the HPLJIIID device type. The newer cartridge allows switching between Hewlett-Packard PCL mode and PostScript.

If you use the new cartridge, the LaserJet must always be in Hewlett-Packard PCL mode when printing from the SAP System. Device type HPLJIIID contains no control sequences for switching between PostScript and HP-PCL.

SAP tested a LaserJet IIID with the following configuration (set at the control panel):

Menu	Option and Setting
Printer	Copies 1
	Typeface source E (installed)
	Page number 0
	Format A4
	Alignment H (portrait format)
	Page length 67
	man. feed off
	Character set Roman-8
Configuration	Auto continue off (action in case of error message)
	I/O: parallel
	Ret: normal (edge resolution)

Setting Up HP LaserJet IIIP, III, IIID, or IIISi



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Setting Up an IBM 4232-302 Printer

The IBM 4232-302 is a dot-matrix printer with a parallel interface and emulations for the IBM 4202 and IBM 4224.

Use the IBM4232 device type for this printer. IBM4232 uses the IBM 4202 emulation and code page IBM 2. For output from the *SAPscript* word-processing program, IBM4232 uses the STN2 printer driver. The X_... paper types for printing R/3 list output set the printer to fast draft print quality. The *SAPscript* formats set the printer to NLQ Courier. The printer does not have italic fonts; therefore IBM4232 supports only standard and bold printer fonts *SAPscript*. OCR-A and OCR-B fonts are built in and supported by R/3.

SAP tested the IBM 4232-302 with the following settings:

Option	Setting
Print format and quality:	
Characters per inch	10
Lines per inch	6
Maximum print position	132
Maximum page length	072
Print quality	DP Quality
Host fast draft	Enabled
Left margin position	012
Printer setup:	
Print language	850 PC multilingual
Display language	000 English
Alarm control	High volume
Forms device	continuous forms (F1)
Form feed mode	Not active in ready state
4224 emulation mode	No
System interface	Parallel
Auto sheet feeder:	
Bin select	Bin 1
Bin priority selection	Data stream accepted
Performance:	
Bar code and graphics mode	High/High
F2 eject mode	Immediate eject
F3 eject mode	Top of form option
NLQ print direction	Bi-directional

Setting Up an IBM 4232-302 Printer

Graphics print direction	Bi-directional
Bar code print direction	Bi-directional
Configuration storage:	
Save current values	Saved
Recall custom set values	Recalled
Change power-on set	Custom set A
Recall factory defaults	Factory defaults recalled
Printer compatibility:	
Compatibility option 01	Standard
Compatibility option 02	Standard
Compatibility option 03	Standard
Compatibility option 04	Standard
Compatibility option 05	Standard
Compatibility option 06	Standard
Compatibility option 07	16.7
Compatibility option 08	Standard

Important settings for using the printer with the IBM4232 device type are as follows: 4224 emulation mode must be set to No; Print language must be set to 850; Compatibility Options 01-08 to the values shown above.



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Setting Up a Lexmark/IBM 238x/239x Plus Printer

Setting Up a Lexmark/IBM 238x/239x Plus Printer

The IBM 238X/239X Plus (Lexmark) matrix printer series includes at the time of this writing the following models: IBM 380 Plus, IBM 2381 Plus, IBM 2390 Plus, IBM 2391R/3 Plus. You can use the IBM239X device type for all of these printers.

The 238X Plus series includes 9-dot matrix printers and the 239X Plus series 24-dot matrix printers. The two series differ only in the maximum paper width that can be used. All of the printers support IBM Proprinter and EPSON emulations.

IBM239X uses the Proprinter emulation and the character set IBM 850. For SAPscript output, IBM239X uses the STN2 printer driver.

X_... formats for R/3 list output set the printer for fast draft print quality. SAPscript formats set the printer to draft print quality.

SAP tested the IBM 2391 Plus with the following settings:

Option Group	Option	Setting	
Form macro options	Standard macro	Inactive/Macro 1	
	Character options	Macro 1 Macro 2...	
	Standard font	Courier	
	Standard spacing	10	
	Code page	850	
	Character set	2	
	Additional paper control	Aut. single-sheet feed	On
Automatic paper feed		Off	
Paper format		72 LPP/12,00"	
Left margin		0	
Right margin		13,6	
Bottom margin		0	
Lines per inch		6	
Output SV		On	
Data options		Buffer	
		On	
	Aut. ZV	Off	
	Aut. ZS	Off	
	Null with /	Off	
Control options			

Setting Up a Lexmark/IBM 238x/239x Plus Printer

	1 direction	Off
	EBZ automatically available	On
	Top of page	Permanent
	End-of-paper signal	Active
	Bi-directional	
	Demo printing	Active
	Menu language	German
Emulation options		

Setting Up the Lexmark/IBM 4226 Printer

The IBM4226 printer (Lexmark) is a 9-pin dot-matrix printer with a parallel interface. The printer supports IBM and EPSON emulations.

Use the IBM4226 device type for this printer. IBM4226 sets the printer to IBM emulation and character set IBM 850. For *SAPscript* output, IBM4226 uses the STN2 printer driver.

X_... formats for printing R/3 list output set the printer to fast draft print quality. *SAPscript* formats set the printer to draft print quality.

SAP tested the IBM 4226 with the following settings:

Option	Setting
EPSON emulation	off
Font type	Draft
Spacing	10 CPI
Line length	13.6 inches
Lines per inch	6
Paper format	72 Lines per page/12.00"
Emphasized	off
Character size	normal
Character set	2
Code page	850
Loaded code page	850
Text quality	bidirectional
Beginning of line	off
Line feed	on
Null with /	on
Acust.signal	on
Buffer size	maximum
Interface	parallel

For the IBM4226 device type, you should set the EPSON emulation to **off**, character set to **2**, code page to **850**, and loaded code page to **850**.



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Setting Up a Kyocera F-1000

Setting Up a Kyocera F-1000

The Kyocera F-1000 is a laser printer that uses the PRESCRIBE printing language and emulates many other printer types.

Use the KYOF1000 device type for this printer. The printer is often driven using PCL4 emulation, the most powerful of the emulations other than the native PRESCRIBE. The entire configuration can be changed using software without having to change the settings manually at the printer control panel. The F-1000 is largely compatible with the Kyocera F-1200, but with fewer typefaces, less storage, no display, and so on.

As of 1989, the F-1000 printer was outfitted with extra fonts and other capabilities. If your F-1000 has these features you can use the device type for the Kyocera F-1200 for your F-1000. The F-1200 device type uses extra fonts and other features (for more information, see [Setting Up a Kyocera F-1200 or F-1200S \[Page 191\]](#)).

To check the printer status and number of available fonts, run the following short report from the ABAP programming environment. Substitute the name of your Kyocera F-1000 as defined in the SAP System for 'printer name'.

```
REPORT KYOSTAT;  
NEW-PAGE PRINT ON  
DESTINATION 'printer_name'  
NEW LIST IDENTIFICATION 'X'  
IMMEDIATELY 'X'  
NO DIALOG.  
WRITE '!R! RES; STAT; FLST; RES; EXIT, E;'  
NEW-PAGE PRINT OFF.
```

The report causes the printer to print a status sheet and a list of the resident fonts. If the printer has more than 36 fonts you can run the printer as a Kyocera F-1200 for printing from the SAP System.

Using OCR-A Typeface Cassettes

Kyocera offers no OCR-A typeface cassette for the Kyocera F-1000 laser printer. OCR-A typeface cassettes for this printer are available from independent software companies in Germany. SAP tested an F-1000 with an OCR-A cassette from [LaserPrint](#). The R/3 device type for the F-1000 is designed for this board (that is, the printer character set and the font command for the selection of the OCR-A typeface are board-specific).

As there is no standard board for OCR-A printing with the F-1000, you will probably need to create your own device type definition for OCR-A printing if you use a different cartridge than SAP did. This is because the character set used by an OCR-A cartridge differs even among the cartridges offered by LaserPrint. For example, the three cartridges offered by LaserPrint use character sets with different hex code assignments for the OCR-A special characters.



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Setting Up a Kyocera F-1200 or F-1200S

The Kyocera F-1200 and F-1200S are laser printers with parallel and serial interfaces. You can use the KYOF1200 device type for both printers. KYOF1200 uses the OTF_PRES driver (for Kyocera's Prescribe printer language) for output from SAPscript word processing.

Configuration Notes

SAP tested an F-1200S using the following configuration settings:

Option	Setting
MSG language	ENGLISH
I/F Mode	RS-232C
RS-232C/baud rate	9600
RS-232C/data bits	8
RS-232C/stop bits	1
RS-232C/parity	None
LF action	LF only
CR action	CR only
FF timeout	15 sec
Font	1
Emulation	HP LaserJet Ser2
Country	U.S.A.

Using OCR-A Font Cartridges

Kyocera offers no OCR-A font cartridge for the Kyocera F-1200 and F-1200S laser printers. OCR-A font cartridges for this printer are available from independent software companies in Germany. SAP tested an F-1200s with an OCR-A cartridge from [LaserPrint](#). The R/3 device type for the F-1200 is designed for this cartridge (that is, the printer character set and the font command for the selection of the OCR-A typeface are cartridge-specific).

You will probably need to create your own device type definition for OCR-A printing if you use a different cartridge than SAP did. This is because the character set used by an OCR-A cartridge differs (different hexadecimal assignments) even among the three cartridges offered by LaserPrint.



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Setting Up a Mannesmann Tally MT 600 Printer

Setting Up a Mannesmann Tally MT 600 Printer

The Mannesmann Tally MT600 is a line printer with parallel and serial interfaces.

Define an MT600 printer with one of the following device types, depending upon the language that you require:

- Device type MT600: USASCII (American ASCII character set)
- MT600GER: GERMAN (German character set)
- MT600NDA: NORWEGIAN/DANISH (Norwegian/Danish character set)

At the time of this writing, the MT600 printer supports only 7-bit country-specific character sets. It therefore cannot print all European special characters in a single character set configuration. The multiple device types, which differ only in the selection of the printer character set, offer a solution to this problem.

The device types use the STN2 driver for printing output from the *SAPscript* text processing system.

The following sources were used to maintain the MT600 printer definitions:

- Mannesmann Tally MT600 Line Printer - Basic Serial I/O Applications Manual, Manual Number 244-3
- Mannesmann Tally MT600 Line Printer - Fonts Manual, Manual Number 245-2



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Setting Up an OKI ML 3410 Line Printer

The OKI Microline 3410 is a 9-pin dot-matrix printer with serial and parallel interfaces. The serial (RS232-C) interface, however, does not have the "standard plug".

Use the OKI341 device type to define this printer in the SAP System. The device type:

- Uses the STN2 driver for printing SAPscript output.
- Requires that the printer be run in EPSON emulation mode
- Uses its own printer code page (character set). The character set has the ID number 1123 in the SAP font maintenance system.

Configuration Notes

SAP tested the OKI341 printer at an Hewlett-Packard700 UNIX workstation using the parallel port. The printer was tested with the following configuration:

Menu	Option	Setting
Printer mode	Emulation mode	EPSON FX
Font	Print mode	Utility
	Pitch	10 CPI
	Style	Normal
	Size	Single
Symbol sets	Character set	Set II
Language set	German	
	Zero Character	Unslashed
	Slash Letter 0	No
	Code Page	U.S.A.
Rear feed	Line spacing	6 LPI
	Form tear-off	Off
	Skip over perforation	No
	Page width	13.6"
Bottom feed	Page length	12"
	Line spacing	6 LPI
	Form tear-off	Off
	Skip over perforation	No
Top feed	Page width	13.6"
	Page length	12"
	Line spacing	6 LPI

Setting Up an OKI ML 3410 Line Printer

	Skip over perforation	No
	Page width	8"
	Page length	11 2/3"
Set-up	Graphics	Bi-directional
	Receive buffer size	16k
	Paper out override	No
	Print registration	0.00 mm
	Op. panel function	Full operation
	Reset inhibit	No
	Print suppress active	Yes
	Auto LF	No
	CSF Bin select	Bin 1
	Time out print	Valid
	Auto select	No
	Sensor disable	No
Parallel I/F	I-Prime	Buffer print



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Setting Up an SEL Alcatel 4440XT Line Printer

The SEL Alcatel 4440XT is a line printer with serial and parallel interfaces. You can use the S4440XTG device type for printing from the SAP System with the German character set. S4440XTG uses the STN2 printer driver for SAP*script* output. S4440XTG uses a special printer code page that contains German special characters. This code page has the ID number 1121 in the R/3 font maintenance functions.



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Setting Up an SNI 4009 Line Printer

Setting Up an SNI 4009 Line Printer

The SNI 4009 printer is a line printer with serial and parallel interfaces. Use the SNI4009 device type to define the printer in the SAP System. SNI4009 uses the STN2 printer driver for SAPscript output.

Configuration Notes

The printer was tested by the Siemens-Nixdorf Competence Center at SAP using the following configuration:

Menu	Option	Setting
Font	Print	ModeUtility
	Pitch	10 CPI
	Style	Normal
	Size	Single
	SI Select (IBM)	17.1 CPI
General Control	Emulation Mode	EPSON FX
	Graphics	Uni-directional
	Buffer size	Normal
	Paper out override	No
	Print Registration	0
	Op. panel functions	Full operation
	Reset inhibit	No
	Print suppress effective	Yes
	Page width	13.6"
	CPU compensation	Standard
	Vertical control	Line spacing
Form tear-off		Off
Skip over perforation		No
Auto LF		No
Auto CR (IBM)		Yes
Auto feed XT (EPSON)		Invalid
Page length		12"
Sheet page length	Sheet page length	11 2/3"
	CSF bin select	Bin-1
	Symbol sets	Set II

Setting Up an SNI 4009 Line Printer

	Code page	U.S.A.
	Language set	ASCII
	Zero character	Unslashed
	Slashed letter	No
	DLL Utility (IBM)	Normal
Serial I/F Option	Parity	None
Serial data	7 or 8 bits	8
	Protocol	XON/XOFF
	Diagnostic test	No
	Busy line	DTR
	Baud rate	9600
	DSR signal	Valid
	DTR signal	Ready on power up
	Busy time	200ms

The following settings are important since they cannot be set with software (that is, with escape sequences):

- *Emulation mode* must be set to EPSON FX.
- *Character set* must be set to Set II.
- *Reset Inhibit* must be set to No.



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Setting Up an SNI 4010 Line Printer

Setting Up an SNI 4010 Line Printer

The SNI 4010 is a line printer with serial and parallel interfaces. Use the SNI4010 device type for defining the printer in the SAP System. SNI4010 uses the STN2 printer driver for SAPscript output.

Configuration Notes

The printer was tested by the Siemens-Nixdorf Competence Center at SAP using the following configuration:

Menu	Option	Setting
Font	Print Mode	Courier
	Pitch	10 CPI
	Style	Normal
	Size	Single
General Control	Emulation Mode	EPSON LQ
	Graphics	Bi-directional
	Max receive buffer	8k
	Paper out override	No
	Print Registration	0
	Op. panel functions	Full operation
	Reset inhibit	No
	Print suppress effective	Yes
	Page width	13.6"
	CPU compensation	Standard
	Vertical control	Line spacing
Form tear-off		Off
Skip over perforation		No
Auto LF		No
Auto CR (IBM)		No
Auto feed XT (EPSON)		Valid
Page length		12"
Sheet page length		11 2/3"
CSF bin select		Bin-1
Symbol sets	Character set	Set II
	Code page	Multilingual
	Language set	ASCII
	Zero character	Unslashed
	Slashed letter	No
Serial I/F Option	Parity	None
Serial data	7 or 8 bits	8
	Protocol	XON/XOFF
	Diagnostic test	No
	Busy line	RTS
	Baud rate	9600
	DSR signal	Valid
	DTR signal	Ready on select
	Busy time	200ms

Setting Up an SNI 4010 Line Printer

The following settings are important since they cannot be set with software (that is, with escape sequences):

- *Print mode* must be set to COURIER. If print mode is set to UTILITY, typeface selection does not work for font cassettes (for example OCR-A).
- *Emulation mode* must be set to EPSON LQ.
- *Character set* must be set to Set II.
- *Code page* must be set to multilingual (=IBM 850).
- *Reset Inhibit* must be set to No.



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Setting Up an SNI 4011 Line Printer

Setting Up an SNI 4011 Line Printer

The SNI4011 is a line printer which is available in several different versions. The printer definition here only relates to the 24-pin version of the SNI 4011.

Printer definition SNI4011 is used to print from R/3. This uses the IBM 850 (multi-lingual) character set.

The standard driver II (STN2) is used for *SAPscript*. OCR-A and OCR-B fonts are pre-installed on the printer, and are supported by the printer definition.

Configuration Notes

The Siemens-Nixdorf / SAP Competence Center tested the printer successfully with the following settings:

Option	Setting
Emulate	Epson LQ-850+
Font	ROMAN
CPI	10 CPI
LPI	6 LPI
Skip	0.0 Inch
Bidir	On
ZG-Tab	Graphics
CharSet	Extended
Country	TABLE 850
0-Through	Off
Auto-CR	On
Auto-LF	Off
AutoTear	ViewTear=Off
Width	13.6 Inch
Forml	12.0 Inch
Feeder (Push) FormAdj	12/72"
Bin2 FormAdj	12/72"
Bin1 FormAdj	12/72"
Single FormAdj	12/72"
Feeder (Pull) FormAdj	12/72"
Menu	1
ColOpt	Not available

Setting Up an SNI 4011 Line Printer

PapOpt	None
Phys.Adju.	0/72"
Buffer	1.7 KB
Interf.	Serial
Serial Baud	9600
Format	8 Bit No 1 Stop
Protocol	XON/XOFF
DevAttr	On
AFI	On

If you want to use the SNI4011 device type definition, then you must set the EMULAT, FONT, ZG-TAB, CHARSET, and COUNTRY parameters to the values shown in the table above.



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Setting Up an SNI 9014-12 Line Printer

Setting Up an SNI 9014-12 Line Printer

The SNI 9014/12 is a line printer with serial and parallel interfaces. It also offers OCR-A and OCR-B in addition to "normal" typefaces.

Use the device type SNI9014 to define the printer in the SAP spool system. The device type definition specifies the STN2 standard driver II for printing SAPscript output.



The 9014 printer is available in several interface configurations. This documentation applies only to the 9014/12, which offers an Epson and an IBM Proprinter emulation.

Notes for Configuring a Printer

The printer was tested with the following option settings:

Option	Value
Buffer size	8 KB
AGC position	24
Character length	8 bits
Header interval	0
Interface type	both active
Paper-in just.	0
Baud rate	9600 bits/second
Uni-direct. Bef.	Yes
Protocol	XON/XOFF
Menu access	All functions
Font	Courier
Print quality	LQ
Half line	Positioning
Line spacing	6 LPI
Form length	72 lines
Vert.Pos.Just.	0
Beginning of line	1 position
End of line	136 position
First line	first line
Last line	first line up from bottom
Spacing before perforation	Yes
Paper source	Tractor

Setting Up an SNI 9014-12 Line Printer

Paper output	File
Emulation	EPSON LQ
Character set	IBM code page 850
Line mode	LF=LF+CR
\$\$ commands	No
Tear off	No
Sing.pages	No



The following defaults are important since they are not set by software (that is, escape sequence):

- The font must be set to COURIER. If the font is set to DATA, then the built-in OCR-A typeface does not work.
- The emulation mode must be set to EPSON.
- The character set must be set to IBM 2 code page 850.
- First line must be set to 1 (default is 4).
- Last line must be set to first line from bottom (default is 4).



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Monitoring the Spool System

Monitoring the Spool System

Use

Within the R/3 monitoring architecture you can monitor the performance of your SAP spool system. The spool monitor is a tool which provides you an overview of the system status allowing you to react quickly to alert messages.

You can access the spool monitor by choosing *Tools* → *CCMS* → *Control/Monitoring* → *Alert monitor*. Open the monitor set *SAP CCMS Overview Monitors*. Double-click *Spool*. The system displays a monitoring tree you can expand to display the information you require.

You can use this monitor template as is, or you can copy it into your own monitor set and modify it.

Features

The spool monitoring tree is divided into a overview of the system and an overview of the individual spool servers. The table below the graphic explains the individual components (*Monitoring Tree Elements*, MTE) in the system-wide overview. Threshold values are set for the individual attributes. Each attribute has a color indicating whether the current attribute value falls below or exceeds the threshold value. The tree can display the attributes from several points of view. You can select the view level by choosing *Extras* → *Display options* and then *Dsply tree*.

Object	Attribute	Meaning
SpoolNumbers	UsedNumbers	Percentage of numbers in a spool number range occupied by spool requests
SystemWide	MaxWaitTime	Maximum wait time of the system spool service
Frontend	WaitTime	Wait time to set up connection to the frontend printers
[Server_name]	Status	Spool server status
	WaitTime	Spool server wait time
SAPcomm	WaitTime	Wait time during transfer of output requests for fax devices (access method X) to the SAP communication server

The lower part of the tree contains the spool server nodes. The table below the graphic explains the individual components (*Monitoring Tree Elements*, MTE) and their attributes.

Object	Attribute	Meaning
SpoolService	Utilization	Spool server load
	QueueLength	Length of the dispatcher queue
	ServiceQueue	Length of the spool service queue
	ServiceQueuePriv (not in the overview view)	Length of the spool service queue for processing requests sequentially
	DeviceCacheUsed (not in overview and analysis views)	Size of the used cache area
	DeviceCacheFixed (not in the overview view)	Size of used fixable cache entries

Monitoring the Spool System

	HostspoolListUsed (not in the overview view)	Used host spool list area
Devices		Job processing as well as host spool queries from specific devices When defining an output device, you can specify that it is to be monitored (tab).
	LPQ_Time	Time an output request spends in the output device queue
	Pages/Min.	Number of pages the device outputs per minute
	Messages	Last message delivered by the LPQ

Activities

The monitoring architecture of the SAP System provides you with various options for monitoring your system and analyzing any errors. For a detailed description, see [Using the Release 4 Alert Monitor \[Ext.\]](#).



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Using Security Functions for Printers

Using Security Functions for Printers

Use

If you implement *Secure Network Communications* (SNC), you can activate security functions for your output devices.

Activities

Activate security functions for an output device (available only if you are using access method S).

On the *Security* tab page, select the functions you want to activate for communications between the SAP System and this device:

- *No security*: Output data is transmitted from the spool server to the PC across the network without any encoding or encryption. No SNC authentication is used.

This is the default setting.

- *Disguise*: The spool server and the SAPIpd program use a *converted* output data stream. Output data is protected from “accidental” viewing, but the conversion encoding is relatively easy to decode.

You do not have to implement R/3 Secure Network Communications (SNC) to use this security option.

- *Authentication only* (the system verifies the identities of the communication partners)
Integrity protection (the system detects any changes or manipulation of data that may have occurred between the two end points of a communication)

Privacy protection (the system encrypts the messages being transferred to make eavesdropping useless. Privacy protection also includes integrity of the data.)

These options activate functions in R/3 Secure Network Communication (SNC). Both the R/3 server and the target PC (SAPIpd program) must be SNC-enabled. See the R/3 security documentation (restricted access) or contact SAP for assistance.

Authentication requires the host printer to verify its identify. *Integrity and privacy* activates secure encryption of output data.

- *Security mode*: Specify whether the PC (SAPIpd program) must meet your security requirement or not. Mark *Optional* to allow printing even if the PC cannot comply. Mark *Required* to terminate printing immediately if the PC cannot comply.

Background: The options above specify how the SAP spool server should behave. This option lets you specify what the server should do if the target PC (SAPIpd program) is not able to respond with the same level of security. This can cover, for example, a situation when a server demands authentication, but a PC is not SNC-enabled.



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Managing Output Devices: General Functions

This section provides information about managing output requests

[Managing Connection and Communication Timeouts and Retries \[Page 208\]](#)

[Testing Output Devices \[Page 214\]](#)



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Managing Connection and Communication Timeouts and Retries

If an output request is sent to a remote output device, the SAP System verifies that it can reach this output device.

If the spool work process waits more than 15 seconds for a reply, then it records the problem in the SAP System log. You can therefore check in the system log for devices that have chronic communication problems.

If the spool work process must wait more than 30 seconds, then it locks the output device for five minutes and goes on to other output requests. The output request keeps the status *Waiting*. At the end of this lock period, the spool work process attempts to establish communication again.

The output requests are only reactivated once the host spool system is available.

The connection test is repeated three times every five minutes. If the remote host spool service cannot be reached, the output requests still have the status *Waiting*.

The connection test is restarted (three times every five minutes) if

- A new output request is generated for the host spool system concerned
- An output device in this host spool system is reactivated
- The R/3 application server is restarted.

The output requests are reactivated once the host spool system can be reached. This operation can be repeated up to three times. If the output requests could still not be output, they are given the status *Error*.



You can set timeouts both centrally in the system profile as well as individually in the individual output device definitions.

For more information, see:

[Setting Connection Timeout Value \[Page 211\]](#)

[Setting Read-Write Timeouts \[Page 212\]](#)

[Setting the Retry Count and Delay \[Page 213\]](#)



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Creating a Network Connection

This topic describes how the R/3 spool system uses connection timeouts, read-write timeouts, and automatic retries to:

- Terminate an attempt to establish communication with a host spool or print manager when a network connection is not working
- Automatically try to establish a network connection after a connection or read-write failure

Connection Timeouts

The R/3 spool system uses its own internal timeouts to determine how long to wait for a network connection to a remote output device. If the spool system has not been able to establish a network link within the time limit specified in the timeout, then it terminates the attempt to set up the connection.

The network software in your host system also imposes a timeout on the connection to a remote printer. The length of the timeout varies depending on the host operating system and network software. The timeout is usually set to 60 seconds.

The spool system's attempt to reach an output device is terminated by whichever timeout occurs first: the network software timeout or the R/3 spool timeout.

The other partner in setting up a connection to a remote output device can be either of the following:

- The host system responsible for the target device
- The R/3 SAPLPD process responsible for the output device

A timeout can therefore mean that the network connection to the remote system is down or that the host system or R/3 SAPLPD program is not running.

Automatic Retry

If a timeout occurs, the spool system retries the connection. By default, it repeats the connection attempt three times, with a two-minute pause between each attempt.

If the R/3 System is not able to establish a connection after the retries, then all jobs that are waiting for the output device are placed in a special waiting status, *Hold: Communication problem*.

If the output device is local (attached to the host system on which the R/3 spool work process is running or accessible from the host system by way of host remote printing facilities), then these mechanisms do not need to be used. Passing an output request to the local host spool system requires only the execution of a print command.

The spool system keeps retrying the network connection as long as there are jobs with the status *Hold: Communication problem* waiting for the output device.

Read and Write Timeouts

In addition to connection timeouts, the R/3 System uses read and write timeouts to prevent unrestricted waiting for read or writes to remote output devices. If a read or write timeout occurs, the R/3 System retries the operation. The number of retries and pause between retries is determined by the same system profile parameters used for the connection timeout.

Creating a Network Connection

The system profile value for read and write timeouts is valid for all output devices. You can also specify a read or write timeout for a single output device.

Wide Area Network Connections

If you are using a wide area network (WAN) connection to an R/3 transfer process, then timeouts can pose special problems. If data transmission across the WAN link is too slow, then the read-write timeout of the R/3 spool system or of your host network software may be triggered while transmitting data across the connection. The minimum throughput for successful data transfer to an SAPLPD process is 1 kilobyte/minute.

Should this problem occur, a faster WAN link is the best solution to the problem. If this is not possible, then one of the following measures should help:

- If the host spool supports remote printers, use the host's remote printing facilities to access the printer. You then no longer need the WAN link to the R/3 SAPLPD transfer process. Data transmission may be more successful under the host's remote printing facility than through SAPLPD.
- If the remote SAPLPD is running under Microsoft Windows, you can reset the SAPLPD packet size to a smaller value, as of SAPLPD version 2.19. The default packet size is 1000 bytes and is set in the WIN.INI file, section SAPLPD, parameter s_packet_size.



For more information, see [Setting Read-Write Timeouts \[Page 212\]](#).



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Setting Connection Timeout Value

The default length of the connection time-out is set in the system profile in the parameter **rspo/tcp/timeout/connect**.

Do not set the timeout to a value that is shorter than the default value.

Setting the timeout for an individual output device

You can set an individual timeout value for output devices that use host spool access methods S and U:

1. Call *Spool administration*. (*Tools* → *CCMS* → *Spool* → *Spool administration*). On the *Devices / servers* tab page, enter the name of the output device and confirm your entry.
2. Choose  *Connection options* on the *HostSpoolAccMethod* tab page.
3. In the *Connection time* field, enter the timeout value in minutes.
4. Save your entries.



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Setting Read-Write Timeouts

Setting Read-Write Timeouts

You can set the read-write timeout for SAP spool network communications with the system profile parameter **rspo/tcp/timeout/read**.

The system profile value applies to network communications with all printers. You cannot set a different, device-specific timeout value.

Setting the timeout for an individual output device

You can set an individual timeout value for output devices that use host spool access methods S and U:

5. Call *Spool administration*. (*Tools* → *CCMS* → *Spool* → *Spool administration*). On the *Devices / servers* tab page, enter the name of the output device and confirm your entry.
6. Choose  *Connection options* on the *HostSpoolAccMethod* tab page.
7. In the *Response time* field, enter the timeout value for reads and writes in minutes.
8. Save your entries.



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Setting the Retry Count and Delay

You can set the number of retries of a failed connect or read/write operation using the system profile parameter **rspo/tcp/retries**. You can specify how long the system should wait between retries using the parameter **rspo/tcp/retrytime**.



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Testing Output Devices

Testing Output Devices

Three functions are available for testing new printers. To access the functions, choose *Tools* → *CCMS* → *Spool* → *Spool administration*. Then select *Utilities* → *For test data*. These utilities test printing from an ABAP report and from *SAPscript* and print out the character sets specified in the output device type.

For the *SAPscript* test, enter the text name **sapscript-druckertest** and language **DE** or **EN** in the *SAPscript* text processing screen displayed. Print the text using form S_TEST_P to test portrait printing and using form S_TEST_L to test landscape printing. The text is printed in the S_TEST style.

Additional tests can be executed using the other entries in the *Utilities* menu.

Alternate Printer Names for Testing

For printer testing, you can define more than one name for a printer. Users can continue using the printer as usual under one name while you test different attribute settings using a different name.



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Authorizations to Access the Spool System

To access the spool system, there are separate authorizations (R/3 authorizations) for:

- [Printing \[Page 216\]](#)
- The [Output Controller \[Page 218\]](#) (for managing spool requests and output requests)
- The [Spool Administration transaction \[Page 219\]](#) (for defining printers and managing device definitions).



For details about authorizations, see the authorization object documentation in the SAP System. Enter transaction SU21 and choose the BC_A (Basis: Administration) object class. The names of most spool authorization objects begin with "S_SPO_". The spool system also uses the S_ADMI_FCD object.



For more information about spool system authorizations, see SAP Note 119147.



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Printing Authorizations

In the standard SAP System the default is that all users may print any amount of output on any R/3 output device.

The spool system provides authorizations so that you can limit these privileges. You can do the following:

- **Limit printer access:** Allow access only to specific printers by name.

Authorization object: S_SPO_DEV (*Spool: Devices*)

Use: Limit a user's access to R/3 output devices by name. Example: An authorization for **FI_PR*** with S_SPO_DEV would allow a user to print only on devices whose names begin with this string.

You can also assign authorizations for authorization groups, instead of for explicitly specified output devices. To do this, see [Authorization Groups for Output Devices \[Page 217\]](#).

Sample profiles: None.



In order for users to be able to use [Frontend Printing \[Page 23\]](#), they must have authorization for the front-end printer as well as authorization for the output device %LOC.

- **Limit amount printed:** Permit users to submit output requests only up to a specified number of pages.

Authorization object: S_SPO_PAGE

Use: Specify the maximum number of pages permitted in a user's output requests. To use this authorization, you must set the `rspo/auth/pagelimit` parameter in the system profile to 1. All users must have authorization for S_SPO_PAGE when the changed profile becomes active; otherwise no user will be able to print.

Sample profiles: None.



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Authorization Groups for Output Devices

Using the *Authorization group* configuration field, you can group output devices according to particular functions, for example. Users may print on all output devices in such a group, provided that they have authorization to do so.

When [defining output devices \[Page 49\]](#), you can enter an authorization group. The group names are in the same namespace as the names of the output devices. You can also use the same names.

Instead of entering an output device explicitly in a user authorization, you can now specify an authorization group. During the authorization check the system uses authorization object S_SPO_DEV for the output devices as well as the authorization groups. This checks authorization for the relevant output device as well as the authorization group.



If you use the name of an existing output device as the group name, usage authorization for this device can no longer be assigned separately. The authorization still applies for all devices in this group.



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Authorizations for the Output Controller

Authorizations for the Output Controller

There are two classes of users in the [Output Controller \[Page 12\]](#) (transaction SP01, *Tools* → *CCMS* → *Spool* → *Output controller*), where users can manage spool requests, generate output requests, and check output logs. These user classes are as follows:

- **End users** are allowed unlimited access to their own spool and output requests in the output controller.

No special authorization is required.

- **System administrators** are users, that can access spool and output requests from other users. They may also have access to these requests in the current client as well as other R/3 System clients.

Authorization objects: To access spool requests and output requests other than your own, you need an authorization for the S_SPO_ACT (*Spool: Actions*) authorization object.

For *Output controller* functions in clients other than the one you are logged onto, you need authorization for the S_ADMI_FCD (*System Administration Functions*) authorization object.

Sample profiles: S_ADMI_SPO_J

This profile authorizes a user to manage spool and output requests in the output controller in all clients and for all users. By client, the profile allows the following:

- In the user's current client: The user must have an additional authorization for S_SPO_ACT (Spool: actions).
- In other clients: Full spool request control.

Authorizations to download and send spool requests

As of Release 4.6A, the following authorizations are required in object S_SPO_ACT, in order to download spool requests as text from the output controller or send spool requests using SAPoffice:

- To download: authorization value DOWN
- To send: authorization value SEND

Create the corresponding authorizations and add these to the authorization profiles.



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Authorizations for Device Administration

Spool system administrators are users who define output devices and maintain and manage other spool system objects.

All administrators need the basic authorization. Otherwise, a user cannot access the spool administration functions (transaction SPAD, *Tools* → *CCMS* → *Spool* → *Spool administration*) at all.

With additional authorizations, you can allow administrators separate access to each of these spool administration functions:

- Defining and managing output devices (making printers and fax machines available to users within R/3); defining and managing spool servers (attributes for spool servers, such as alternate servers)
- Defining and managing output management systems (OMSs) for devices that use access method E
- Defining and managing device types, formats, and other associated lower-level objects in the spool system.

Authorization object: S_ADMI_FCD (*System Administration*)

Sample profiles:

- S_ADMI_SPO_A
Unrestricted spool system maintenance authorization. Allows all operations in *Spool* → *Spool administration*, including defining printers, modifying device types, and so on.
- S_ADMI_SPO_D
Spool maintenance restricted to defining and editing devices (printers). The SAP System uses device definitions to identify printers in your system.
- S_ADMI_SPO_E
Spool maintenance restricted to managing external output management systems (OMSs) in the spool system. Allows a user to define or edit the R/3 spools physical and logical OMS definitions. These definitions enable communication between the R/3 System and an external OMS.
- S_ADMI_SPO_T
Spool maintenance restricted to maintaining device types and associated components. A user can define or edit a device type, work with R/3 formats, work with R/3 character sets, and so on.

Add one or more of the end-user authorization profiles listed above to an administrator profile to specify the access that an administrator has to spool requests in the spool output controller.



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Authorizations for Device Administration

Connecting the Spool System to an External OMS

This procedure shows how to integrate the R/3 spool system with an external output management system (OMS) using the OMS interface.

Prerequisites

Compatible OMS: You must have an OMS that is compatible with R/3 or you must implement the OMS interface yourself.

If you already have an OMS installed, then you must upgrade it so that it supports the R/3 OMS interface.

If you are buying an OMS, it should be one certified for the OMS interface.

Local access: An OMS and all of the devices it serves must be "local" to all R/3 spool servers. That is, the OMS commands issued by R/3 spool servers must be executable on the host system on which each corresponding R/3 spool server is running.

An R/3 spool server stores output data for an OMS device in a file on the host where the server is running. This file is referenced in the OMS Submit command issued by the server, and the file must be accessible to the OMS.

More information about certified OMS products and implementing and certifying the OMS interface is available from the SAP Complementary Software Program (CSP). Internet address: <http://www.sap.com/csp> (Email: csp-europe@sap-ag.de)

Procedure

Follow this procedure for each OMS you want to integrate into R/3 output:

1. Define the real OMS (ROMS).
See: [Defining a Real OMS \[Page 223\]](#)
2. Optional: Organize your OMS output devices by designing a set of logical OMSs (LOMS). You can use a single OMS to access all of the devices in the OMS.
See: [Organizing OMS Output Devices in Logical OMSs \[Page 224\]](#)
3. Define one or more logical OMSs (LOMS). Only one is required.
See: [Defining a Logical OMS \[Page 225\]](#)
4. Define one or more sets of operating system specific commands. Only one of these sets is required.
See: [Defining OMS Command Sets for LOMS \[Page 227\]](#)
5. Make one or more of the OMS output devices available for use in R/3 printing and faxing.
See: [Connecting a Printer to an External OMS \[Page 237\]](#)
6. If you are working in a test system, replicate your OMS definitions in other R/3 Systems.
See: [Transporting OMS Definitions Between Systems \[Page 235\]](#)
7. During production use of your OMS: If you are using RFC callback for reporting of OMS job and device status, you can force reconfiguration of the callback client.

This is an optional step. Usually the OMS callback client reconfigures itself.

Connecting the Spool System to an External OMS

See: [Triggering OMS Reconfiguration \[Page 232\]](#)

Result

You can now use OMS devices for printing and faxing R/3 documents.

Creating a Real Output Management System

To integrate the spool system into an external OMS, you must first create the OMS as a *real OMS* (ROMS) in the spool system. The ROMS specifies the characteristics of the external OMS. Not every OMS offers all of the operations that the OMS interface allows. Therefore, when you create the real OMS in the SAP System, you should specify the options that are supported by the OMS you are using.

Prerequisites

- Your external OMS system should be installed and ready to run before you define it in R/3.
- OMS manufacturers have the option of delivering a configuration file to you. If such a file is available, then uploading it into the spool system creates the ROMS and operating system specific commands for you.

Before proceeding, check to see if such a file is available for your OMS.

Procedure

1. **Is an OMS configuration file available?** If so, then perform the following procedure to upload the file: [Importing OMS Definitions \[Page 233\]](#).
2. **Start the ROMS maintenance tool.** Choose *Tools* → *CCMS* → *Spool* → *Spool administration*. Choose *Extended admin*, and then *Real output management systems* on the *Output management systems* tab page .
Choose *Change* and then *Create*. You can also copy the settings and configuration of an existing ROMS. To do this, select it and then choose *Create with copy*.
3. **Use the OMS documentation to fill out or edit the OMS attributes fields.**
4. **Save the ROMS definition** and exit the function.
5. **If you are using callback: Define the R/3 user and password for the callback client.** The user name and password are used to log onto the SAP System if you are using callbacks. To define user names and passwords, choose *Tools* → *Administration* → *User maintenance* → *Users*. Note that the values entered in the OMS are the same. For more information, see the [User Maintenance Manual \[Ext.\]](#).

Create the user in the logon client of the callback client. The user needs the following authorization to log into the CCMS system management XOM API:

- An authorization for S_XMI_PROD (*Auth. for external management interfaces (XMI)*) with the value **XOM** for field *Interface ID*.

Sample R/3 authorization: S_XMI_ADMIN or S_XMI_XOM_A.

Result

Your ROMS definition for identifying an external OMS is finished. You can now [create logical output management systems \[Page 225\]](#) and [OMS printers \[Page 237\]](#) that reference the ROMS.



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Organizing OMS Output Devices in Logical OMSs

Organizing OMS Output Devices in Logical OMSs

The logical OMS (LOMS) concept lets you group output devices according to how they use the external output management system. This section explains how this concept can be useful to you.

You can assign all of your R/3 OMS output devices to a single LOMS. Only a single LOMS is required.

However, it can be useful to group R/3 OMS devices into separate LOMSs for these reasons:

- **Using separate sets of operating system specific commands:** If your OMS is running on several platforms, you can define a different set of OMS commands for each operating system.

Example: You have special printers that require extra SUBMIT command options. You can meet this requirement by assigning these printers to their own LOMS. You can then define a special command set that uses the special options for the LOMS.

If you want to change commands that apply to several LOMSs, you do not have to change each LOMS individually. You can organize your LOMS into command groups. If you change the commands for an LOMS in a command group, these changes also apply to all other LOMSs in the group.

- **Using different OMS services:** You can use LOMSs to allow different sets of OMS services to be used, according to the printer.

Example: You want to use RFC callback to track the status of critical printers in the shipping department. Less important printers should be tracked only by polling. You can meet this requirement by defining an LOMS for each group. In the critical LOMS, callback is activated. In the other LOMS, only polling is activated.

- **Distributing callback workload:** Should you want to distribute the workload of processing status reports from an OMS callback client, you can do so by defining separate LOMSs. For each LOMS, you can specify a different R/3 server as the callback target.

If any of these requirements apply to you, then you may want to design a set of LOMS definitions that meet your requirements before [proceeding \[Page 225\]](#).



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Creating a Logical Output Management System

The second step in integrating the SAP spool system with an external output management system (OMS) is to define one or more logical OMS (LOMS) definitions.

A LOMS specifies how a particular group of R/3 OMS output devices is to use the external OMS. (For more information about the LOMS concept and its uses, see [Organizing OMS Output Devices in Logical OMSs \[Page 224\]](#).)

If a configuration file was supplied with your OMS or you have imported your own configuration file, then at least one LOMS has probably already been defined for you.

Prerequisites

You have [defined the real OMS \(ROMS\) \[Page 223\]](#) to which your LOMS definitions will refer.

Procedure

1. **Start the LOMS maintenance tool.** Choose *Tools* → *CCMS* → *Spool* → *Spool administration*. Choose *Extended admin.* and then *Logical OMS* on the *Output management systems* tab page.

If the LOMS you want to edit has already been created, select the LOMS name and choose *Change*. Otherwise choose *Change* and then *Create*. You can also copy the settings and configuration of an existing LOMS. To do this, mark it and then choose *Create with reference*.

2. **If you are creating a new LOMS, enter the basic attributes of the LOMS:**

- Enter a name and description for the LOMS.
- Choose the ROMS which this LOMS uses.
- Choose an R/3 server as the *Tasking target*.

3. **Choose**  to copy all the settings of the selected ROMS. You can then edit these settings.
4. **Select a command group**, if any have been defined. Otherwise, enter a character to define the command group.

Local commands: If you want to define commands only for this LOMS, then select *Local* as the command group. When you define a command group, the commands will be used only for this LOMS. The command group cannot be selected from other LOMSs.

3. (If you are using RFC callback), Specify other options and parameters on the *OMS configuration* tab page. If you want to adjust message filtering, choose .
4. **Save the LOMS** and exit.

Result

Your LOMS definition for specifying how R/3 OMS devices are to access an external OMS is complete. You can now define additional LOMSs or define the [commands \[Page 227\]](#) that are required by LOMSs.

Creating a Logical Output Management System



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Defining OMS Command Sets for LOMS

You can define a set of OMS commands to be used by a particular LOMS on a particular platform. When an output request is sent to this LOMS, the SUBMIT, QUERY, POLLING and other commands in this set are used to submit the output request to the OMS and query its status.

You need at least one command set for each operating system on which your R/3 servers are running. For more information, see [Organizing OMS Output Devices in Logical OMSs \[Page 224\]](#).

Prerequisites

You have created at least one [logical OMS \[Page 225\]](#) (LOMS).

Procedure

1. **Start the LOMS maintenance tool**, if you are not already in the LOMS definition for which you want to define a command. Choose *Tools* → *CCMS* → *Spool* → *Spool administration*. Choose *Extended admin.* and then *Logical output management systems* on the *Output management systems* tab page.

Select the LOMS for which you want to define commands and choose *Change*. Then choose  *Commands*

2. **Choose the operating system** for this variant of the OMS commands.

If you have a heterogeneous system environment, you will need a variant for each host operating system on which your R/3 servers are running.

If you have a homogenous operating system environment, define only a single variant, for your operating system.

Background: If the SAP System uses a defined OMS command, it chooses the correct variant according to the local host operating system. Example: If a SUBMIT command is to be issued by an SAP spool server running on Windows NT, then the Windows NT SUBMIT command is used.

Here are the operating system names you can enter:

Value to Enter	Operating System
AIX	IBM UNIX
BOS/X	Honeywell-Bull UNIX
HP-UX	Hewlett-Packard UNIX
OSF/1	Digital Equipment UNIX
OSF1	Digital Equipment UNIX
SINIX	Siemens-Nixdorf UNIX
SunOS	Sun UNIX
Windows NT	Microsoft Windows NT

1. **Enter the *Command path***. This is the full path name for the OMS commands. In this variant, the path name has a prefix for each of the OMS commands.

Ideally, the path name is the same regardless of the R/3 server from which a command is issued. However, you can define server-specific path names if required.

Defining OMS Command Sets for LOMS

2. Enter definitions for each of the commands required by the LOMS.

These commands are described in the OMS documentation. The manufacturer should generally specify these so that you do not have to deal with different parameters. The commands are as follows:

- *Submit*: Passes an R/3 output request to the external OMS for printing.
Definition is always required.
- *Polling*: SAP spool servers issue this command periodically to query the status of output requests that they processed.
Definition required only if you selected *Polling* in the LOMS definition.
- *Queue query*: This is an R/3 user query of the status and queue of an OMS output device.
Definition required only if you selected *Queue query* in the LOMS definition.
- *Job cancel*: R/3 user command for canceling an output request sent to the OMS.
Definition required only if you selected *Deletable* in the LOMS definition.
- *Job query*: R/3 user command query of the status of an R/3 output request in the OMS.
Definition required only if you selected *Query* in the LOMS definition.

For lists of the options available for each command, see the tables below.

Submit Command Options

This table includes the options you can use when defining a Submit command.

Attribute, Required/Optional	Submit Parameter Name	Meaning
SAP spool ID Required	&EI	Internal spool ID. Required by R/3 with RFC callback as the return parameter for identifying an R/3 output request.
Reply message group Required	&EG	ID of an RMG This information is required during polling or callback for classification of the information to be returned.
Destination Required	&P or	Name of the target output device in the OMS (including path)
	&p	Name of the target output device in the OMS (without path)
Document Required	&F	Name of the file containing the print data (including path)

Defining OMS Command Sets for LOMS

	&f	Name of the target output device in the OMS (without path)
Attributes required if RFC callback control is implemented through the Submit command (see the OMS documentation to determine if this is the case)		
SAP instance	&ES	SAP instance name for callback format <hostname>_<system ID>_<system number> '-' if callback not required.
Interval	&ET	Maximum interval for collecting RMG-specific events before forced initiation of callback. Should fewer than <i>Number</i> of events occur, the callback client reports events after this interval elapses.
Number	&EA	Number of RMG-specific events to collect before initiating callback
Optional attributes		
Number of copies	&C	Number of copies
Department	&D	Addressee's department
R3LOMS indicators	&E1	LOMS option settings for OMS services.
LOMS indicators	&E2	OMS indicators of the LOMS This option inserts the contents of the <i>OMS Configuration</i> field from the LOMS definition into the Submit command. This field can be used to insert any desired OMS options or OMS arguments into the command. See also: Defining a Logical OMS [Page 225]

Defining OMS Command Sets for LOMS

R3 ROMS indicators	&E3	ROMS option settings for OMS services. Currently, these are: <ul style="list-style-type: none"> • Job query supported • Job callback supported • Device callback supported • Fax supported For the field structure, see table TSPROMS in the ABAP Dictionary. The options are inserted in the Submit command as a 60-character string.
ROMS indicators	&E4	OMS indicators of the ROMS This option inserts the contents of the <i>OMS Configuration</i> field from the ROMS definition into the Submit command. This field can be used to insert any desired OMS options or OMS arguments into the command. See also: Defining a Real OMS [Page 223]
Fax recipient	&EP	Name of FAX recipient (future enhancement)
Cover page	&H/x/y/	Cover page wanted (alternative 2)? X = yes, Y = no.
Output request name	&I	Output request name (name in R/3) without the SAP System name (database ID)
Output request name	&J	Output request name (name in R/3) including the SAP System name (database ID)
Layout	&L	R/3 format of the output request
R/3 client – spool request owner	&M	Client of R/3 owner of the spool request (user who created the spool request)
R/3 client – output request generator	&m	Client of the R/3 user who created the output request
R/3 user – spool request owner	&O	R/3 user ID of the owner of the spool request

Defining OMS Command Sets for LOMS

R/3 user – output request generator	&o	R/3 user ID of the owner of the output request
R/3 user	&R	R/3 user ID of the addressee (intended recipient) of the output (for delivery of print output)
R/3 printer	&S	Name of the printer in the SAP spool system
Title	&T	R/3 title user gave to the output request (if any)
Fax number	&t	Telephone number of the target fax device
Cover page	&U	Cover page wanted (alternative 1)? (X = yes, N = no)
Priority	&Y	R/3 priority (1-99), where 1 is the highest priority

Result

You have defined commands for use in an LOMS. You can now:

- Define additional commands for other LOMSs
- [Connect a Printer to an External OMS \[Page 237\]](#)



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Triggering OMS Reconfiguration

Triggering OMS Reconfiguration

If you are using RFC callback status reporting, the OMS callback client must always be aware of the current configuration of your SAP spool system: The defined devices (if device callback is active); and the defined LOMS

Every time you make changes to the spool system, the callback client is automatically told to reconfigure itself. This occurs the next time the callback client contacts the SAP System.

You can determine when a reconfiguration is supposed to occur: If changes have been made to the LOMS, the *Reconfiguration required* indicator is selected in the ROMS definition. If a device–list reconfiguration is required, the reconfiguration indicator in the affected LOMS definition is selected.

After the callback client reconfigures itself, it deselects these indicators. This can tell you when a reconfiguration has taken place.

Procedure

You can require the callback client to reconfigure itself even when you have not made changes to the spool system configuration.

To do so, do the following:

1. Choose *Tools* → *CCMS* → *Spool* → *Spool administration*. Choose *Extended admin.* and then *Real output management systems* on the *Output management systems* tab page.
2. To have the callback client update its device information, choose  *Devices*.
The reconfiguration indicators are selected in all of the LOMSs that reference the ROMS. The callback client will refresh its device information the next time it contacts the SAP System.
3. To have the callback client update its LOMS callback information (such as the target R/3 server for callbacks), choose  *Callback*.
The reconfiguration indicators are selected in the ROMS definition. The callback client will refresh its LOMS information the next time it contacts the SAP System.



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Importing OMS Definitions

Use this procedure to import an R/3 OMS definition from a configuration file:

- Provided by your OMS supplier
- You have exported yourself from a test or other R/3 System.

Prerequisites

You have copied the configuration file either a directory at your frontend PC or workstation.

Or, you have copied the file to a directory that is accessible from the servers of the target R/3 System, the system into which you want to import. Example: You can copy the file to the `tmp` directory of the R/3 server at which you are logged on or to the global `work` directory of the R/3 System.

Procedure

1. Log on to the R/3 System into which the file is to be imported.
2. Choose *Tools* → *ABAP Workbench* → *ABAP Editor*. Alternative: Enter Transaction SE38.
3. Enter RSPOXOMS in the *Program* field and choose *Execute*.
4. In the selection screen, do the following:
 - In *Export/Import* file name, enter the full path name of the configuration file.
 - Select *Server* or *Frontend computer* depending upon where you have copied the configuration file.
 - Select *Import*, *Execute import*, and *Generate log*.
5. Run the report.

The report displays a list showing the ROMS and LOMS definitions that have been imported into the R/3 System.

Result

You have imported ROMS and LOMS definitions into the R/3 spool system.

- If you have imported a configuration file that was provided by an OMS maker, then your R/3 System now has the starter set of definitions provided by the manufacturer.
- If you have imported a file that you created yourself, then the OMS definitions that you exported have been replicated in your current R/3 System.

You can now make any changes necessary (such as altered server names) to the definitions.

Exporting OMS Definitions

Exporting OMS Definitions

You can not only [import OMS definitions \[Page 233\]](#) but also export them from your SAP System.

Exporting from one SAP System and importing into another is one way to move your R/3 OMS definitions between SAP Systems. However, you should use this procedure only in exceptional circumstances (a quick move between test systems, for example). The reason: it is easier to keep track of where you copy OMS definitions if you use the recommended "official" transport mechanism. See [Transporting OMS Definitions Between Systems \[Page 235\]](#).

You can also use the export mechanism as a way to save your OMS definitions.

Prerequisites

You would like to move all or some of the objects that make up an R/3 OMS definition between SAP Systems.

Procedure

1. Log on to the SAP System from which the OMS definition is to be exported.
2. Choose *Tools* → *ABAP Workbench* → *ABAP Editor*. Alternative: Enter transaction SE38.
3. Enter RSPOXOMS in the *Program* field and choose *Execute*.
4. In the selection screen, do the following:
 - In *Export/Import* file name, enter the full path name of the configuration file.
 - Select *Server* or *Frontend computer* depending upon where you want to export the configuration file.
 - Select *Export*, *Execute export*, and *Generate log*.
 - Enter a logical OMS and/or a real OMS. You can also export all LOMS definitions to a real OMS.
5. Run the report.

The report displays a list showing the ROMS and LOMS definitions that have been exported from the SAP System in a host-system file.

Result

You have exported all or part of an OMS definition to a file. You can save the file as an informal means of backing up the OMS definition, or you can import the file into another system. See [Importing OMS Definitions \[Page 233\]](#).



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Transporting OMS Definitions Between Systems

You can transport your OMS definitions to other SAP Systems. This means, for example, that you only need to maintain OMS definitions in one system. If you need to make changes, you can then transport the OMS objects from the maintenance system to your other systems.

If you want to use this maintenance model, only use logical spool servers in the definitions of:

- OMS: ROMSs and LOMSs
- Output devices that belong to the OMS

Using logical servers means you will not have to adjust the server names in the OMS definitions after you have transported them. If you specify real servers in the definitions, you will have to change the server names to reflect the servers present in the other systems.

Procedure

There are two ways to transport OMS definitions between SAP Systems. Here, we describe only the recommended method using the R/3 software logistics (transport) system. An alternate method is to download and upload definitions: See [Importing OMS Definitions \[Page 233\]](#) and [Exporting OMS Definitions \[Page 234\]](#).

Transport either a ROMS definition or a ROMS definition with all LOMS definitions that reference it:

1. Choose *Tools* → *CCMS* → *Spool* → *Spool administration*. Choose *Extended admin.* and then *Real output management systems* on the *Output management systems* tab page.
2. Switch to *Change* mode in the ROMS list and choose the ROMS definition you want to transport.
3. Choose the appropriate transport function:
 - To transport only the ROMS definition, choose .
 - To transport both the ROMS definition and all LOMS definitions that reference it, choose  *All*.

In both cases, a transport request is created with which you can transport the OMS definition objects to other SAP Systems.

Switch to the [Workbench Organizer \[Ext.\]](#) (transaction SE09) to transport your OMS definitions.

Result

You have created and transported OMS definitions between SAP Systems. You can track your OMS copy activity in the transport requests you created using this procedure.



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Transporting OMS Definitions Between Systems

Connecting a Printer to an External Output Management System

Use this procedure to make a printer that is served by an external output management system (OMS) accessible for R/3 printing and (optionally) faxing.

Prerequisites

1. You have already defined the external OMS in the SAP spool system. Real OMS (ROMS) and logical OMS (LOMS) definitions must already exist. For more information, see [Connecting the Spool System to an External OMS \[Page 221\]](#).
2. **Can you already print on your OMS printer from your host systems?** If not, then you must first install the output device in the OMS.

Procedure

1. **Start the device definition.** Choose *Tools* → *CCMS* → *Spool* → *Spool administration* → *Output devices* on the *Devices / servers* tab page. Choose *Change* and then *Create* to create a new device definition. If you want to copy the definition of an output device, select this in the list of output devices and choose *Create using template*.
2. **Fill in the fields.**

For help filling in the fields, see the following table.

	Field	Input
<i>DeviceAttributes</i> tab page	<i>Device type</i>	Enter the device type that has been defined in the SAP System for the printer model that you have. You can also use the generic Device Type SWIN [Page 77] here. This means you can use any device supported by Windows, even if the device type is not defined in the SAP System. For a list of the delivered device types, see SAP Note 8928.
	<i>Spool server</i>	Enter the name of the SAP Spool Server [Page 313] that is to prepare the output for this device.
	<i>Authorization group</i>	To assign the output device to an authorization group, enter the name here. For more information, see Authorization Groups for Output Devices [Page 217] .
<i>HostSpoolAccMethod</i> tab page	<i>Host spool access method</i>	Enter E , for printing by way of an external output management system.
	<i>Host printer</i>	Enter the name of the output device in the external OMS

Connecting a Printer to an External Output Management System

	<i>Logical OMS</i>	Choose the LOMS to which this device should be assigned. A LOMS specifies how the device is to be accessed in the external output management system (OMS). For more information, see Organizing OMS Output Devices in Logical OMSs [Page 224] .
--	--------------------	--

3. Optional: Classify the device.

Choose *Edit* → *Classification*. Choose the output type classification appropriate for this device.

Background: If you classify your servers as well, the spool system checks that the device and server classifications match thus ensuring optimal output configuration.

4. Save the device definition and exit.

Result

Your OMS printer or fax machine is immediately available to R/3 users and programs for printing R/3 lists and SAPscript forms and documents.



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Editing Cover Pages for Output Requests

In all standard R/3 device definitions, the cover page used for output requests is defined in the *X_PAPER* format of the device type definition. The *X_PAPER* cover page is the default, used if no cover page has been defined for the page format of an output request that is being output.

If the default *X_PAPER* cover page for a particular type of device is not suitable for use at your site, then you can replace or modify it in either of these ways:

- You can change the definition of the default *X_PAPER* cover page.
- You can override the default cover page by defining special cover pages for particular formats. If a format has its own cover page action, then the spool system uses this instead of the *X_PAPER* cover page.

If you have multiple types of printers at your site, you must define a separate cover page for each device type.

Procedure: Defining or Editing a Cover page

To define or edit a cover page for output requests, do the following:

1. **Copy the device type:** If the cover page is for a standard R/3 device type, then copy the device type to a name that begins with Y or Z (the namespace reserved for customers).

To copy the device type, choose *Tools* → *CCMS* → *Spool* → *Spool administration* → *Full administration* and then *Utilities* → *For device types* → *Copy device type*. In the first field on the next screen, enter the name of the device type you want to copy. In the second field, enter a name for the new device type. This name should begin with a **Z** to avoid any conflict between your device type definition and the standard R/3 definition.

If you only want to change the cover page, select *Use references*. This adds to your copy a reference to device format actions in the standard R/3 device type. Modify the cover page action; the other actions remain as in the R/3 standard even after a system upgrade.

Do not change cover pages in the original standard device type. If you do so, your changes may be lost when the next SAP System upgrade or release is installed.

2. **Edit the new device type:** Return to the initial spool administration screen and select the *Device Types* tab page. Enter the name of the new device type and confirm your entry. Choose  *Formats*.

Choose the format for which you want to create or edit a cover page. Enter *X_PAPER* as the format if you want to modify the default cover page. Enter the name of another format to create a cover page specifically for that format.

3. **Edit the Cover page action.** The next two sections explain what to enter in a cover page action and which variables and symbols you can use to output information on the cover page. The default cover page action is one of the *X_PAPER* actions. *X_PAPER* is used for all formats if the format does not have its own cover page action.
 - **Start by setting up the printer:** A cover page action should first issue any printer commands necessary for setting up the printer. The cover page action is issued **before** the initialization action in which the device is set up for the coming output request. This means that the cover page action must make all printer adjustments necessary so that the cover page prints correctly. (The cover page must come before initialization because by default the

Editing Cover Pages for Output Requests

spool system uses the *X_PAPER* cover page. *X_PAPER* cannot make the required settings as the subsequent print request may use any one of many formats. If the cover page followed initialization, its settings might alter settings made during the initialization. The initialization for the print job therefore comes after the cover page.)

If you are editing a copy of a standard R/3 cover page action, you do not need to change the initialization commands. If you are creating a new cover page action, then use, whenever possible, a standard R/3 cover page as a guide to the commands to be issued to a given type of printer.

For example, you may need to set all of the following printer attributes at the start of a cover page action:

- The printer font and/or character set
 - The printer emulation mode
 - The page format (or page length for the *SAPscript STND* and *STN2* line printer drivers)
 - The leading (lines per inch)
 - The page orientation (portrait or landscape)
- **Then print the cover page:** For the cover page text, you can use two types of variables to add information such as user name, recipient address, and so on.

For a list of the variables, see [Variables for Printing Data on Cover Pages \[Page 241\]](#).



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Variables for Printing Data on Cover Pages

There are two types of texts on cover pages:

- **Static texts.** These are texts that structure the cover page, such as field names like *User name* and *User address* and so on.
 R/3 cover page actions use the "TP_" variables of the spool system to print out these texts. TP_ variables are translatable and are output in the language specified in the output device definition in the SAP spool system.
- **Dynamic texts.** These are texts that output variable information such as the user's name, number of pages, and so on.
 R/3 cover page actions use three types of variable to output dynamic texts. These are spool, user address, and profile variables.

"TP_" Translatable Variables for Static Texts

The TP_ variables let you insert static texts, such as field names, in a cover page.

The standard set of TP_ variables with their default English translations is shown in the table below. However, you can add your own TP_ variables and your own translations of these variables. For more information, see [Working with the "TP_" Cover Page Variables \[Page 245\]](#).

"TP_" Variables: Static Texts on Cover Pages

Predefined TP_ Variable Name	Default Value (English)
TP_CLIENT	Client
TP_COUNT	Number
TP_CREATE	Created
TP_DEPART	Department
TP_DEVICE	Device
TP_DEVTYP	Device type
TP_DTABSE	Database
TP_FORM	Format type
TP_FROM	From
TP_HOST	Host
TP_OUTREQ	Output request
TP_OWNER	Owner

Dynamic Variables: Spool, User Address, and Profile Variables

You can use any of the variables shown in the following tables on your cover page.

Variables for Printing Data on Cover Pages

Enter the variables in the following format: \$(<variable>).

Each set of dynamic variables derives its values from a different source:

- The "User" variables are replaced with the *User address* information in the user master record. These variables are listed in the "User variables" table below.

To see what is recorded in the user address variables, choose:

- System* → *User profile* → *User address* (display your own address information)
- Tools* → *CCMS* → *User maintenance* → *Users and Goto* → *Address* (display information for any user).

If you have maintained the user addresses in your user master records, then you can output these values on cover pages by using the "User address" variables. For example, you can print a user's name, room number, and telephone number as they are recorded in the user master record on a cover page.

- The "Spool system" variables shown in the second table below are provided with values by the spool system when a spool request is generated.
- The "Profile" variable in the third table is replaced with the value of the *rspo/layout* parameter in the system profile. The profile of the R/3 server where the spool request was generated provides the value.

User Variables: Cover Page Values Supplied from the User Address Data

Variable	Meaning
\$(USR_SALUT)	Salutation or form of address from the <i>Form of address</i> field
\$(USR_NAME1)	First line of <i>Name</i> field
\$(USR_NAME2)	Second line of <i>Name</i> field
\$(USR_NAME3)	Third line of <i>Name</i> field
\$(USR_NAME4)	Fourth line of <i>Name</i> field
\$(USR_ABTLG)	<i>Department</i> field
\$(USR_KOSTL)	<i>Cost center</i> field
\$(USR_BUINR)	<i>Building number</i> field
\$(USR_ROOMR)	<i>Room number</i> field
\$(USR_STRAS)	<i>Street</i> field
\$(USR_PFACH)	<i>PO Box</i> field
\$(USR_PSTLZ)	<i>Postal code</i> field
\$(USR_PSTL2)	<i>Postal code extension</i> field (neighborhood-level codes)
\$(USR_ORT01)	First <i>Location</i> field
\$(USR_ORT02)	Second <i>Location</i> field
\$(USR_REGIO)	<i>Region</i> field
\$(USR_LAND1)	<i>Country key</i> field

Variables for Printing Data on Cover Pages

\$(USR_TELNR)	Telephone no. field
\$(USR_TEL01)	Extension field (first part)
\$(USR_TEL02)	Extension field (second part)
\$(USR_TELPR)	Private telephone number (No data entry field in the user address screen. Value provided only if users' private numbers are inserted directly in the USR03 table with an ABAP program.)
\$(USR_TELX1)	Telex number field
\$(USR_TELFX)	Telefax number field
\$(USR_TELTX)	Teletex number field

Spool System Variables: Cover Page Values Supplied by Spool System

Variable	Meaning
\$(ANZAHL)	Number of copies to be printed.
\$(ABTEILUNG)	Department of the user who created the spool request.
\$(ANGELEGT)	Date and time when the spool request was created.
\$(BENUTZER)	User who requested the print out.
\$(DB)	Storage location of the output request.
\$(DRUCKAUFTRAG)	ID number of the output request (sequential number starting with 1 and referring only to the output requests generated from a particular spool request.
\$(DRUCKER)	Name of the destination output device, as defined in the SAP spool system.
\$(DRUCKERTYP)	Type of output device, as defined in the SAP spool system.
\$(DSN)	First part of the three-part name generated by the SAP System for a spool request. (See also the SUFFIX1, SUFFIX2, and TITLE variables.)
\$(ERZEUGT)	Date and time when the output request was generated.
\$(EIGNER)	User who generated the spool request. (This may be a different user than the creator of the output request in the BENUTZER variable).
\$(EMPFAENGER)	The user to whom the print out should be delivered.
\$(FORMULAR)	The spool format used for an output request. If the document is an SAPscript document, then this is also the name of the SAPscript form used to format the document.
\$(GEDRUCKT)	Date and time when an output request was processed by the SAP spool system.
\$(MANDANT)	Client in which an output request was generated.
\$(PRIO)	Priority within the SAP spool system.

Variables for Printing Data on Cover Pages

\$(RECHNER)	The name of the host system in which an output was processed.
\$(SPOOLID)	ID number of the spool request in the SAP spool system.
\$(SUFFIX1)	Second part of the three-part name generated by the SAP System for a spool request. (See also the DSN, SUFFIX2, and TITLE variables.)
\$(SUFFIX2)	Third part of the three-part name generated by the SAP System for a spool request. (See also the DSN, SUFFIX1, and TITLE variables.)
\$(TITEL)	Name given to a spool request by a user. Shown instead of the spool name (variables DSN, SUFFIX1, and SUFFIX2) if defined.

Profile variable: Values supplied by the system profile

Variable	Meaning
\$(PARAM_)	The value of the system profile parameter rspo/layout.



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Working with the "TP_" Cover Page Variables:

Working with the "TP_" Cover Page Variables:

The "TP_" cover page variables are designed to give you flexibility in working with static texts on cover pages.

Here is what you can do with the "TP_" variables:

- Add your own "TP_" variables.
To add a variable, you need only add an entry to the "TP_" table. The variable is then ready to use in cover pages in all of the languages that you maintain.
- Change the R/3 default values for the predefined "TP_" variables.
The "TP_" variables can have both an R/3 default value and a customer-specific value. If you specify your own value for a "TP_" variable in a particular language, then this value is used instead of the R/3 default value.
At upgrades, your values are preserved even if the upgrade reloads the R/3 default "TP_" values.
- Add new translations for "TP_" variables.
You can add translations for a language not supported by the standard system by simply adding a new language key to the "TP_" table.

Procedure

Here is how to work with the "TP_" variables:

1. Choose *Tools* → *CCMS* → *Spool* → *Spool administration*.
2. Then choose *Configuration* → *Device types*, or *Definitions* and then *Cover page texts* on the *DeviceTypes* tab page.
3. Now you can specify the language with which you want to work and either display or change the "TP_" variables.

Standard (Std.) and local texts: Standard texts are the default values for "TP_" variables. They are provided by R/3 in the standard set of variables. Do not change the standard texts; your changes may be overwritten at the next system upgrade.

If you want to override an R/3 standard text, then choose *Local texts* and *Change*. Any texts you enter override the R/3 standard texts. You can override the standard English text "C l i e n t" for TP_CLIENT with a local text such as "Client".

Adding new variables: To add an entry, type in a name up to six characters long. Leave off the TP_ prefix. The prefix is automatically added. (When you use the new variable in a cover page action, be sure to type in the TP_ prefix.)

Then enter the text for the variable. If more than one language is in use in your system, be sure to maintain the variable in the other language(s) as well.

The new variable will not be affected by new releases.

New languages and checking for completeness: If you want, you can translate the "TP_" variables to a language that is not already maintained. Do the following:

- a) Enter the *Language key* that you want to use and then choose the *Change* function.

Working with the "TP_" Cover Page Variables:

- b) Choose *Edit* →  *Compare*.

Then specify the language of your reference set of "TP_" variables. This is E or D if you are working only with the standard set of variables.

The *Compare* function copies the reference set of variables into your new language. You can then modify them as you want.

You can use *Compare* as well to bring different languages up to date with the reference language. If you have added three variables to English, you can use *Compare* to add the three variables to the German "TP_" variables.

4. You can use new or altered variables in *Cover page* actions (or other *Actions*) as soon as you have entered them.



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Suppressing Cover Page Output

Formats for continuous forms printing (such as INCH11, INCH8, and so on) generally should not print cover pages. Standard R/3 formats for continuous forms printing are defined so that the cover page is suppressed.

To suppress a cover page, enter a comment line in the *Cover page* action for each of the affected formats. A comment overrides the default use of the X_PAPER cover page but produces a NOP, null operation, when the format that contains the action is used.



The *Cover page* action for the standard R/3 HPLJ4 (Hewlett-Packard LaserJet 4 and compatibles) INCH8 format is defined as follows:

```
# No cover page
```

The # character at the start of a line produces a comment line in actions.



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Device Types for SAP Output Devices

Device Types for SAP Output Devices

The device type information is used to convert a document from an internal format (OTF or text format) into a device-specific, print-ready data stream. A device type specifies attributes that apply to all devices of a particular model, and can therefore be used by multiple device definitions. For example, all Hewlett-Packard LaserJet IIID-compatible devices use the device type HPLJIIID in the SAP spool system.

The device type specifies which *SAPscript* printer driver the system should use for output formatting for devices of this type, as well as which printer character sets are required.

We deliver a set of pre-defined device types with the standard system. We are continually adding to this set, so that the newest printers are always included; for more information, see SAP Note 8928). If necessary, you can define your own device types. For more information about this, see [Defining a New Device Type \[Page 249\]](#).

The standard device types are completely defined and do not need to be changed or added to before being used in device definitions.



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Defining a New Device Type

A device type is the SAP spool system's container for storing information about a particular type of output device such as a PostScript printer. The device type stores the same type of information as a printer driver on a Windows PC: the information needed to generate device-specific, ready-to-print data.

You can modify any part of a device type as required. For example, you may want to add support for an SAP*script* printer font that is not part of the R/3 standard font set. This change would require adding new print controls to the device type to enable it to switch to the font. Only make changes to an R/3 standard device type using your own copy of the device type. Otherwise, your changes may be overwritten when you upgrade your SAP System.

In this section, we review how to define a device type from start to finish. If you want to extend an existing device type, see the relevant step in the procedure for more information.

Procedure

1. Copy the device type.

If you are modifying an standard R/3 device type, only work on a copy of the device type. Otherwise, your changes may be lost during a system upgrade.

If you are creating a new device type, working from a copy of a similar device type is easier than starting from scratch. The print controls and device type formatting actions required are already present.

Procedure: See [Copying Device Types \[Page 254\]](#).

2. Edit the device type.

Use: The device type identifies a particular printer or fax machine model.

When to edit: You are defining a completely new device type.

How to edit: Using a copy of an standard R/3 device type.

Contents:

You can specify:

- The R/3 character set that should be used for formatting device output. The character set specifies the character codes to send to the device for printing specific characters.
- The driver to use for formatting SAP*script* documents

Procedure: [Editing Device Types \[Page 255\]](#)

3. Add a new character set or extend an existing character set, if required.

Use: An R/3 character set is used to convert output from the internal R/3 representation into the codes required by the output device to print the output correctly.

When to edit: You are defining a new device type and none of the standard R/3 character sets are suitable for the device. You can then add a new character set or extend a copy of an existing character set by adding characters to it.

Procedure

Where to edit: Using a copy of an R/3 standard device type. The number for a new character set must begin with "9"; this places the character set in the customer namespace.

Contents: A character set contains the set of SAP characters that can be output at a device that uses that character set. R/3 characters specify the code to send to a device in order to produce the corresponding character.

For more information, see [Maintaining Character Sets \[Page 299\]](#).

4. Add page formats.

Use: A page format specifies the physical size and orientation of an output page. As of Release 4.5A, both *SAPscript* and list printing use page formats. The physical page dimensions determine and specify the printable area on a page. This information, in turn, determines how the page is filled with text.

When to edit: You need to add new page formats for paper sizes or output layouts not included in the standard system.

Page formats are used together with formats and device formats to determine how text should be printed on a particular paper size or in a particular layout format. To define a new paper size, you need to add all three of these objects.

Where to edit: Under *Page formats*. Name must begin with Y or Z. Do not alter existing page formats as otherwise R/3's *SAPscript* forms or ABAP lists may not print correctly.

Contents: Physical paper dimensions and orientation (*SAPscript* and lists) or lines and columns in page layout (list text).

Procedure: [Creating Page Formats \[Page 292\]](#)

5. Add formats.

Use: Formats specify the paper sizes or output formats that can be used with R/3 device types. Example: Standard R/3 device types support formats such as DINA4, LETTER, and X_65_80.

When to edit: You need to add new formats for paper sizes or output layouts not included in the standard system. Do not alter or delete existing formats as otherwise R/3 documents may not print correctly.

Formats are used together with page formats and device formats to determine how text should be printed on a particular paper size or in a particular form. To define a new paper size, you need to specify all three of these.

Where to edit: Under *Formats*. Name must begin with Y or Z. Do not alter existing formats, as otherwise R/3's *SAPscript* forms may not print correctly.

Contents: Name of corresponding page format (same as format name for *SAPscript* formats, page format ANY for list text formats).

Procedure: [Creating Formats \[Page 257\]](#)

6. Define or edit device formats.

Use: A device format specifies a format for a particular device type. That is, it associates sets of device-specific commands, called actions, with a format. The SAP spool system uses device type formatting actions to output printer commands during printing. These actions specify printer operations. Examples of actions: configure printer for the incoming output request, or specify line end, page end, or printer reset after the output request has

completed. Printer initialization is especially important, as this sets critical format information, such as lines per page.



The device format for the X_65_80 format (ABAP list and editor output) for the HPLJ4 device type (Hewlett-Packard LaserJet 4 printer) contains the following actions: *Printer initialization*, *Reset*, *End of page*, *End of line*. Each action contains the appropriate printer commands for carrying out the indicated operation. *Printer initialization*, for example, sets the line spacing to 65 lines specified by the format. The *End of line* action issues carriage return and line feed commands to the printer.

Device type formats are device-specific. They are copied with a device type.

When to edit:

In the following situations:

- You need to add a device type format for a new format (a new type of paper or layout).
- You need to customize a copy of an R/3 standard device format. Normally, you should only customize the cover page for output requests in the *Cover page* action. Other changes may have adverse effects on list and SAPscript printing. For information about customizing the cover page, see [Maintaining Cover Pages for Output Requests \[Page 239\]](#).

Where to edit: Always using a copy of the R/3 device type.

Contents: Printer/fax commands for the standard R/3 actions – *Printer initialization*, *Cover page* (optional), *Reset at end*, device-specific combination of *Start of line*, *Start of page*, *End of line*, *End of page* (see similar standard R/3 device type).

Procedure: [Editing Device Type Formats \[Page 262\]](#)

7. Define or edit print controls.

Use: The SAP System provides a set of standard formatting tags known as "print controls." Print controls are used in all types of R/3 documents (SAPscript forms, ABAP list output). Print controls are used mostly for character formatting, but also overlap in function with device type format actions in some cases (SLAND, SPORT, SLINE, and SPAGE print controls). Print controls are usually inserted in documents under program control (by one of the SAPscript printer drivers or by an ABAP program or report), though users can also enter them in SAPscript documents directly.

When an output request is generated, print controls are converted into printer-specific escape sequences to control how text is output. For example, print controls change fonts, print bar codes, and perform other character formatting operations.

When to edit: When you are defining a new device type or extending or customizing the formatting capabilities of an existing device type.

Where to edit: Using a copy of the R/3 device type. Print controls are specific to a device type and are copied with the device type. You can therefore change standard R/3 print controls under their original names in a copied device type. New print controls should have names that start with Y or Z (customer namespace).

Contents: The printer or fax commands required for the operation as specified by the print control.

Procedure

Procedure: [Editing Print Controls \[Page 270\]](#)

8. Implement OCR or bar code printing, if required.

If you want to print Optical Character Recognition (OCR) characters or bar codes, you must first enable these printing functions. For more information, see [Bar Code Printing \[Page 147\]](#).

9. Save your device type changes in the SAP System.

Component	Procedure for activating your changes
New/copied device type	Enter as a device type under device definitions in the SAP spool system. Required for changes to formats (page formats, formats, and device formats), character sets, and print controls.
New character set	Enter in a copied device type. Automatically takes effect when the new device type is used. Must be in accordance with character set specification, if any, in the device format <i>Printer initialization</i> (list printing) and with the character sets that may implicitly be selected at the printer using <i>SAPscript</i> SF<xxx> font print controls. For help with testing, see Testing Output Devices [Page 214] .
New page format	Enter the <i>SAPscript</i> forms that should use the new format (<i>SAPscript</i> Form Painter).
New format	For <i>SAPscript</i> : Activated with new device type when new page format is activated. For list printing: Add to affected reports with NEW-PAGE PRINT ON LAYOUT/ SUBMIT... TO SAP-SPOOL LAYOUT (print at list generation). For printing from list display, adjust REPORT width specification to force selection of the format and move format to R/3 namespace (name "X...").
New device type format	Automatically activated when the device type, page format, and format are activated.
Print controls	List printing: List print controls edited under their standard R/3 names are automatically activated when the new device type is activated. New print control names: Enter in affected reports with PRINT-CONTROL FUNCTION. Effective only if a list is printed as it is generated. <i>SAPscript</i> printing: SF (font) and SBP/SBS (bar code) print controls require: <ul style="list-style-type: none"> • New <i>SAPscript</i> fonts for the fonts/bar codes (<i>SAPscript</i> Font Maintenance) • Use of the new fonts in affected <i>SAPscript</i> forms (<i>SAPscript</i> Form Painter). To define other print controls, you need to use the <i>SAPscript</i> /: PRINT-CONTROL statement to add print controls to the affected <i>SAPscript</i> texts.



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Copying Device Types

Copying Device Types

Modify only a copy of an R/3 standard device type, not the original version. Otherwise, your changes may be overwritten by the R/3 standard when you upgrade your system.

To copy a device type, do the following:

1. Start the spool administration function by choosing *Tools* → *CCMS* → *Spool* → *Spool administration*.
2. Choose *Utilities* → *For print control* → *Copy device type* to copy the definition of an output device.

Enter a name of your choosing that begins with a **Y** or a **Z**.

- **Use references:** Leave blank to have device format actions copied directly into the new device type. Do this when you are defining a completely new device type on the basis of a similar device, or when you plan large-scale changes to the actions in the device format.

Mark this option to have device format actions included by reference from the original device type. Do this when you plan only limited changes or extensions to an existing device type. Advantage: the device format actions remain up-to-date with changes made in the R/3 standard device type.



You want to customize the cover page but plan to leave other actions as they are. You can completely replace the cover page action(s). Other actions reference the actions in the R/3 standard. Any updates by SAP are automatically reflected in the referenced actions.

3. The SAP System copies all of the following when you copy a device type:
 - The device type definition.
 - The print controls defined for a particular device type. (You can add to the list of standard print controls, however, without restriction.)
 - The device format
 - *SAPscript* printer fonts and printer bar codes defined for the device type.



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Editing Device Types

The device type consists of several components, all of which are linked by a header, which is the device type definition itself. This topic explains what you can specify directly in the device type definition.

To create or edit a device type, choose *Tools* → *CCMS* → *Spool* → *Spool administration* and then *Full administration*. Then choose *Device types* to display a list of device types. If you have already copied the device type (see [Copying Device Types \[Page 254\]](#)), then just double-click your device type. Otherwise, use *Create* or *Create with reference* to set up a new device type.

You can then edit the following fields:

- **SAPscript Driver:** Enter the name of the *SAPscript* printer driver to use with this device type. The drivers convert output from the *SAPscript* OTF format into Postscript or PRESCRIBE format, for example.

The following table describes *SAPscript* drivers in more detail.

SAPscript OTF Drivers

Drivers	Printers
POST	PostScript printers
PRES	Kyocera printers that use the formatting language PRESCRIBE
HPL2	Hewlett-Packard or compatible printers that use the PCL-4 (LaserJet II) or PCL-5 (LaserJet III, 4, 5, and 6) printing language
STN2	Line printers. This is a generic driver for printers that cannot be driven by one of the other OTF drivers. Proportional fonts are not supported, but character attributes such as boldface, italic, and so forth are supported. Note: The STN2 line printer driver requires that a printer can be driven in true line-mode. That is, the printer can correctly print a file that contains only printable characters and NEWLINE, CARRIAGE RETURN, and FORM FEED commands. A PostScript printer is, for example, not a line printer.
SWIN	Windows printers by way of the SAPIpd transfer program. This driver is for use only with the SAPWIN/SWIN device type. SWIN converts <i>SAPscript</i> OTF format to an internal R/3 protocol that SAPIpd understands and converts to Windows GDI commands. By way of SAPWIN/SWIN, you can use any type of Windows printer, regardless of whether it has a device type definition in R/3.
TELE	Default driver for fax and telex traffic from the SAPcomm communications server. Used only in the standard device types predefined for SAPcomm (TOPCALL, for example). Produces an ASCII-only output stream. The driver ignores font changes, superscripts and subscripts, underlining and other changes in font attributes.

Other drivers you may notice are either for SAP internal use or are not used.

You can only use the following functions if you are using (or copying) device types **HPLJ4000**, **KYOFS170**, **POST2** and **SWIN**:

- **Drivers for list printing:** Enter the name of the list printer driver for this device type. The drivers convert output from the internal list format to one of the following formats: PCL-5, PostScript (Level 2) or PRESCRIBE II.

The following table describes the SAP System drivers for list printing in more detail:

Editing Device Types

Drivers	Printers
HPL2	Hewlett-Packard or compatible printers, that use printing language PCL-5 (LaserJet III, 4, 5 and 6).
POST	PostScript printers (PostScript Level 2)
PRES	Kyocera printers that use the PRESCRIBE II printing language.
SWIN	Windows printer, by way of the SAPIpd transfer process
[No entry]	Leave the field empty if your device type should not use the list printing drivers. However, when implementing formats for your device type, you can specify that individual formats should use a driver for list printing. For information about this, see Editing Device Type Formats [Page 262] .

- **Printer character set:** Enter the ID number of the R/3 character set compatible with the printer model you are defining. This character set is used to convert output characters from their R/3-internal representation to the codes needed for outputting the characters at the printer. The character set must be defined in the SAP spool system (*Spool Administration*).

Enter the same ID number in all three character set fields. The first character set is used for all output requests sent to printers of this type. The second and third character sets are reserved for future use.

To select an R/3 character set for a printer, use the character set specified for a similar device type, if possible. Otherwise, check that the character set identification on the printer status sheet or in the printer manual is similar to that in the R/3 character set. If you are still not sure which character set to use, compare the character codes in the R/3 character set with those in the technical guide to your printer, or do a test print with a character set. (See [Testing Output Devices \[Page 214\]](#) for more information).

If you cannot find an R/3 character set that meets this requirement, then you can define an additional character set. (See [Maintaining Character Sets \[Page 299\]](#) for help.)



OCR-A or OCR-B (optical character recognition) printing: If your device type is among those supported by R/3 for OCR, then you only need to enter the standard R/3 character set for the device type. This character set includes the special OCR-A characters hook, chair, and fork. The character set can be used for both normal and OCR output. See [Printer Types that Support OCR Printing \[Page 140\]](#) for supported printer types. OCR printing is not supported for Eastern European and Asian character sets.



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Creating Formats

Formats specify how the text is to appear on paper printouts. As the format names indicate, the formats indicate mainly what paper size to use.

The SAP System describes three different types of formats:

- Formats used by *SAPscript*. The standard formats are named after the page format used
- Formats used by the spool system. The names of the standard formats begin with the letter X.
- Format names beginning with G are reserved for R/3 business graphics.

To create a new format for *SAPscript* form printing, see [Creating Formats for SAPscript \[Page 260\]](#).

To create a new format for list output, see [Creating List Formats \[Page 258\]](#).



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Creating List Formats

Creating List Formats

Use

The names of the R/3 standard formats for list printing indicate how many characters per line and how many lines per page. Examples: X_65_80 (print 65 lines 80 characters wide per page); X_65_120 (print 65 lines 120 characters wide per page).

All list formats use a non-proportional font (except for device types that use HPL2 or PRES drivers for list output). For line printers, all formats assume that a printer uses a 12-inch paper length. For page printers, all assume LETTER or DINA4 paper size.

Procedure

1. Choose *Tools* → *CCMS* → *Spool* → *Spool administration, Full administration* and then *Formats* on the *DeviceTypes* tab page.
2. To create your new format, on the next screen choose *Change* and then *Create* or *Create with reference*.

Give the format a name starting with Y or Z (for customers the reserved namespace.) This avoids conflicts with standard R/3 formats. If you are modifying a list format, then follow R/3's naming convention: Y or Z_<LL>_<CC> where <LL> is the number of lines to print on a page, and <CC> is the number of characters to print on a line.

3. Enter **L** in the field *Type (Format for ABAP lists)*. Choose *Enter*.
4. Enter **ANY** as the page format if you do not want to specify the page format. Before Release 4.5A, with the "X formats" used by the spool system for printing ABAP lists the paper size and alignment are specified but the page format is not required.
From Release 4.5A, list printer drivers interpret the page format and alignment specifications. You adapt the list size to the paper tray information in the output device.
5. Enter the line and column number of the area to be printed.
6. Optional: Select *List driver* if your format is to be used for device types using one of the list printing drivers (copies of device types HPLJ4000, KYOFS170, POST2 and SWIN). Choose *Enter*.
7. Choose *Edit* →  *List driver atts* to determine the layout attributes. On the next screen you can determine the orientation of the output and define the margins.
Note that the page format you select also exists with the orientation (Landscape or Portrait) you set for the format. If this is not the case, the system displays an error message.
8. Save your entries.

Result

To implement the format, you need to define a device type format for the new format (for information about this, see [Implementing Device Type Formats \[Page 264\]](#).)



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Creating Formats for SAPscript

Creating Formats for SAPscript

Use

A device type must have a format to match every page format that is used in a SAPscript form.

Prerequisite

You have created a [page format \[Page 292\]](#) that your format references.

Procedure

1. Choose *Tools* → *CCMS* → *Spool* → *Spool administration, Full administration* and then *Format types* on the *DeviceTypes* tab page.
2. To create your new format, on the next screen choose *Change* and then *Create* or *Create with reference*.
3. Give the format a name starting with Y or Z (the reserved namespace for customers). This avoids conflicts with R/3 standard formats. The format and page format names should be identical. Example: If, for example, the page format name is ZDINA3, the corresponding format must also be called ZDINA3.
4. In the field *Type*, enter **S** (*Format for SAPscript*).
5. Select a page format.
6. Select the *Portrait* and *Landscape* fields. These fields are purely documentary and have no effect on processing.
7. Save your entries.

Result

To implement the format, you must implement the format in one or more device types (for more information about this, see [Implementing Formats for Device Types \[Page 264\]](#)).

SAPscript uses the standard formats listed below. If you add a new device type, define at least these formats.

Since the format has a purely documentary role, you will need to add commands to the *Printer initialization* action in the *Device type* → *Formats* to set the paper type at the printer for some of these formats, as indicated in the table. For information about the commands to enter in the *Printer initialization* action, see [Editing Device Type Formats \[Page 262\]](#).

DINA3	Format for the European DIN A3 (297 x 420 mm) paper format
DINA4	Format for the European DIN A4 (210 x 297 mm) paper format
DINA5	Format for the European DIN A5 (148 x 210 mm) paper format
EXECUTIVE	Format for the American EXECUTIVE (7 ¼ x 10 ½ in.) paper format
LEGAL	Format for the American LEGAL (8 ½ x 14 in.) paper format.
LETTER	Format for the American LETTER (8 ½ x 11 in.) paper format.
INCH2	Format for 2-inch continuous-feed forms (labels, for example)

Creating Formats for SAPscript

INCH4	Format for 4 1/16-inch continuous-feed forms (bank transfers, for example).
INCH4C	Format for 4-inch continuous-feed forms
INCH5	Format for 5-inch continuous-feed forms
INCH6	Format for 6-inch continuous-feed forms
INCH7	Format for 7-inch continuous-feed forms
INCH8	Format for 8-inch continuous-feed forms
INCH11	Format for 11-inch continuous-feed forms
INCH12	Format for 12-inch continuous-feed forms (check forms, for example).
LINE_21	Format for 21-line continuous-feed forms (3 1/2 inches at 6 lines per inch).
LINE_22	Format for 22-line continuous-feed forms (3 2/3 inches at 6 lines per inch).



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Editing Device Type Formats

Editing Device Type Formats

To define a device format, do the following:

1. Select *Tools* → *CCMS* → *Spool* → *Spool Administration* → *Full administration* and then *Device types*.
2. In the *Device types* field, enter the device type whose device formats you want to alter. Usually, this will be a device type you have copied. Confirm your entry and choose  *Formats*.
3. On the next screen, choose the device format you want to edit.
4. You see a list of the actions that may be defined in a device format. Those that are already defined are marked in color. From this screen, you can edit the actions and the attributes of the format for your device type.

With formats for ABAP lists, you can edit the following attributes:

Attributes: If you are working with any type of **PostScript** printer, make sure that *PostScript format type* is selected for formats for ABAP lists. Do this for every PostScript device format by choosing  *Attributes* from this screen and selecting the appropriate field.



With PostScript formats that use the printer for list printing, do not select the field *PostScript format type*.

Editing actions: You can make changes to actions by double-clicking an action. When you do so, the system opens a programming editor in which you can make your changes. Your source for the device-specific commands that you need to enter should of course be the technical guide or programming manual supplied with your printer or fax machine.

Before you edit any actions, read [important notes \[Page 265\]](#).

You can include actions from other device formats with the `\I` command. You can find more information in the special characters note.

Driver for List Formats

From Release 4.5A, special drivers in the R/3 kernel now control the format of lists (this is no longer handled by formatting actions). The drivers can now interpret page formats and paper tray information. You can also print icons, symbols, lines and colors in lists using these drivers. You can change the attributes of the formats that are passed onto the driver, such as margins and font sizes.

The new drivers can also interpret paper tray specifications in the printer definition and adapt the selected format to an existing paper format.

If you copy one of the device types HPLJ4000, KYOFS170 or POST2, you can specify in the device type definition that the list printing driver should use all the list formats.

However you can also choose to assign the suitable list printing driver only for specific device type formats (for device types HPLJ4000, KYOFS170 or POST2). To do this, proceed as follows:

1. Choose a list format from the list of device type formats.

Editing Device Type Formats

2. Choose  *Attributes*. On the subsequent screen, choose  *List driver attributes*.
3. On the next screen, choose the driver for list printing.
4. Let the system determine the font width and height automatically or enter the values yourself. To do this, choose *Explicit increment*.



If you specify the values yourself, each character is set individually during print formatting. This reduces printer performance considerably.

5. Define the attributes of the font for the list format. You can find the information you need to do this in your printer manual.
6. Choose *Enter* and save your input.



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Implementing Formats for Device Types

Implementing Formats for Device Types

Prerequisites



Make the following changes only to **copies** of SAP original device types.

To be able to implement a new device type format, you must [Create the corresponding format type \[Page 257\]](#). In addition, a page format must exist for this format type.

Procedure

1. Choose *Tools* → *CCMS* → *Spool* → *Spool administration, Full administration*
2. In the *Device types* field under the *DeviceTypes* tab page, enter the name of the copied device type (Zxxx) and confirm your entry.
3. Choose  *Formats*. Then choose *Change* and *Create*.
4. Enter the name of the format type that you want to use for your device type. Choose *Enter*.
5. Select the new format.
6. Copy the format of a device type for which this format is already in use. Then choose  *Copy format*, enter the required data and then choose  *Copy*. This copies all the template's actions and attributes into your new format.

You can also copy individual actions from a format. To do this, select the desired action (printer initialization, for example) and choose  *Copy action*, enter the required data and choose  *Copy*.

7. Save your device type format.

Result

Enter the copied device type in the definition of the output devices that are to use the new format.

For information about how to edit actions and attributes of a device type, see [Editing Device Type Formats \[Page 262\]](#).



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Editing Format Actions



For device types that use one of the drivers HPL2, POST, PRES, or SWIN for formatting lists, formatting does not take place in the actions but is executed by the drivers. You can edit the attributes of the formats so that you no longer have to enter control sequences in the individual actions. For more information, see [Editing Device Type Formats \[Page 262\]](#).

The following is a description of how you edit the actions of formats that do not use any of the list printer drivers:

- **Sample device type formats:** You can use the X_65_80 (list output) and DINA4 (SAPscript) device type formats as templates for your own device type formats. If you are adding a new format to an existing device type, then these device type formats can help you to identify the actions and commands that the new device type format should contain.
- **Which actions are required?** Only the actions listed below are used by the R/3 System. You can leave all other actions empty. They are reserved for future use.

Device Type Format Actions Used by R/3

Action	Usage and Notes
Cover page	<p>Inserted as the first element in the output data stream, before the printer initialization action. Use: Prints an identification sheet at the start of an output request.</p> <p style="text-align: center;"></p> <ul style="list-style-type: none"> • The <i>Cover page</i> action is sent only if activated (per printer in the <i>Output device</i> definition) or by the user in the print selection screen. • By default, the <i>Cover page</i> action of the X_PAPER format is used. Standard R/3 device types define only the X_PAPER cover page. You can override the default for particular formats by defining a <i>Cover page</i> action for the format. <p>For more information, see Maintaining Cover Pages for Output Requests [Page 239].</p>

Editing Format Actions

<i>Printer initialization</i>	<p>Sent at the start of an output request after the cover page action (if any) has been sent to the printer. Use: Configures the printer as required by the format of an output request.</p> <p style="text-align: center;"></p> <ul style="list-style-type: none"> • For List Formats [Page 258], see the X_65_80 device format of a similar device type for the printer commands that you should issue. <i>Printer initializations</i> often specify the character set, page length, line feed, character spacing, and font. Printer initializations vary greatly, however, depending on device type. • For SAPscript Formats [Page 260], see the DINA4 device format of a similar device type for the printer commands that you should issue. <i>Printer initializations</i> often specify the printer emulation and character set. You do not need to specify the font, character pitch, line feed, or paper type. The <i>SAPscript</i> printer drivers set these through print controls. Printer initializations vary greatly, however, depending on device type and OTF driver. • Add a # (no operation) for SWIN and related device types.
<i>Reset at end</i>	<p>Sent at the end of a print request. Use: Reset a printer to a particular state, such as a particular emulation.</p> <p style="text-align: center;"></p> <ul style="list-style-type: none"> • If you do not want to reset the printer, leave the action undefined or enter a comment character. • Ensure that the escape sequences you enter do not cause a line feed or otherwise change the print position as the print request may then not print correctly. • Add # (no operation) for SWIN and related device types.
<i>End of page</i>	<p>Sent at the end of every page of an output request. Use: Used in printing lists to generate a form feed (new page). See the table below for a summary of the requirements for the end-of-page and end-of-line actions.</p>
<i>End of line</i>	<p>Sent at the end of each line in an output request. Use: Used for list output and for most <i>SAPscript</i> output to generate a new line (carriage return and line feed). See the table below for a summary of the requirements for the end-of-page and end-of-line actions.</p>
<i>Start a new page</i>	<p>Sent at the start of every page of an output request. Only defined in POSTSCRIPT list formats. Not defined in standard R/3 device formats; has therefore no effect on output. Inserted in the output stream by default so that you can use it if needed.</p>

Editing Format Actions

<i>Start of line</i>	Sent at the start of every text line of an output request. Only defined in POSTSCPT list formats. Not defined in standard R/3 device formats; has therefore no effect on output. Inserted in the output stream by default so that you can use it if needed.
----------------------	---

- **End of Page, End of Line Actions: Required Definitions**

Format Type	End-of-line definition	End-of-page definition
X_* formats for list output	\r\n	\r\nf
SAPscript STN2 driver	# (comment, null operation)	# (comment, null operation)
SAPscript HPL2 driver	\r\n	# (comment, null operation)
SAPscript PRES driver	\r\n	# (comment, null operation)
SAPscript POST driver	\n	# (comment, null operation)
SWIN driver for Windows printing	\n	\f

- **Line spacing and page length specifications for line printers:** R/3 standard *Printer initialization* actions for line printers (printers that use the SAPscript driver STN2) specify line spacing (lines per inch) and page length (lines per page).

These specifications do not select a particular paper size at the printer. Rather, they tell the printer where to insert a page break in the output.

The following table shows the line spacing and page lengths for the standard R/3 formats.

Line Printer Specifications

Format	Use these values in the <i>Printer initialization</i> action
DINA3	Line spacing: 6 lines per inch (LPI) Page length: 140 lines Note: Not pre-defined for most device types.
DINA4	Line spacing: 6 LPI Page length: 70 lines
DINA5	Line spacing: 6 LPI Page length: 50 lines
EXECUTIVE	Line spacing: 6 LPI Page length: 72 lines
LETTER	Line spacing: 6 LPI Page length: 66 lines
LEGAL	Line spacing: 6 LPI Page length: 72 lines
INCH4	Line spacing: 6 LPI Page length: 25 lines
INCH4C	Line spacing: 6 LPI Page length: 24 lines
INCH6	Line spacing: 6 LPI Page length: 36 lines
INCH7	Line spacing: 6 LPI Page length: 42 lines
INCH8	Line spacing: 6 LPI Page length: 48 lines

Editing Format Actions

INCH11	Line spacing: 6 LPI Page length: 66 lines
INCH12	Line spacing: 6 LPI Page length: 72 lines
LINE_21	Line spacing: 6 LPI Page length: 21 lines
LINE_22	Line spacing: 6 LPI Page length: 22 lines

If you are defining device type formats for a page printer (SAPscript drivers POST, PRES, HPL2), then refer to the corresponding device type format in a similar device type for the line spacing and page length specifications required.

- **Printer initialization action:** Ensure that the escape sequences that you define match the page dimensions and orientation specified in the format and page format associated with a device type format.

Also, ensure that any character set specified in escape sequences matches the character set specified in the device-type definition. The character set must also be compatible with any implicit character set changes made at the printer by SAPscript font changes. The spool system cannot test to ensure that these specifications match. To test printing, see [Testing Output Devices \[Page 214\]](#).

- **The actions editor and special characters in printer initializations and print controls:** The system uses the R/3 programming editor for editing device escape sequences. In the editor, you can use the special characters shown in the table below to simplify entering escape sequences. You can also use a set of variables for defining cover pages, such as \$(BENUTZER) (user) and \$(SPOOLID) (spool number). See [Maintaining Cover Pages for Output Requests \[Page 239\]](#).

Character	Meaning
\e	ESC (escape) symbol used by many printer manufacturers. It has the hexadecimal value 1B and the decimal value 27.
\0x	Marks the following two characters as a hexadecimal number (one byte). Example: 0xF0
#	Marks an entire line as a comment at the beginning of the line. The line is not sent to the output device.
\n	Line feed (hexadecimal 0A)
\r	Carriage return (hexadecimal 0D)
\f	Form feed (hexadecimal 0C)
\s	Space character (when required at the end of a line) (Hexadecimal 20)



Line breaks: Note that the line ends on the printer escape screen are not sent to the printer. To start a new line in the printer output stream, you must enter \n or \r\n in the device escape sequence.

- **Default Actions:** If a format does not contain a definition for the cover page (in the device type format), then the X_PAPER cover page is printed as a default.

The spool system uses default actions if two other actions – end of page or end of line – are undefined. The default actions may result in printing of empty lines or pages in *SAPscript* print requests that use the STND or STN2 drivers.

To prevent the spool system from using defaults for undefined actions, define each of these actions with at least one comment line in each device type format that you define. SAP has defined these actions in all standard *SAPscript* formats.



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Print Controls

Print Controls

Print controls are generic format indicators for print operations, such as for activating bold, changing the font size and so on. During formatting, the generic indicators are replaced by the printer commands required by the specific device type. The print controls, together with the [Device Type Formats \[Page 262\]](#), make up the language for the R/3 formatting of an available printer or other output device.

To be able to use a new print control in a document, either the task of the print control must be programmed in an ABAP report or ABAP program, or the print control must be added to SAPscript documents. A print control can be either added directly to SAPscript or to the definition of an SAPscript form.

Creating a new print control

If you are defining a completely new print control, you need to do the following:

1. Add it to the *Standard print controls*.

Procedure: [Entering a Print Control in Standard Print Control \[Page 271\]](#)

2. Implement it in the device types in which it is needed. Implementing a print control requires simply that you specify the print command(s) that are to be triggered by the print control.

Procedure: [Adding Print Controls to a Device Type Definition \[Page 272\]](#)

3. Put the new print control into effect in the SAP System by adding it to the ABAP reports (with the PRINT-CONTROL statement) and SAPscript layout sets (in window texts with `! PRINT CONTROL <name>`) or standard texts in which it is to be used.

Changing print controls

Changing the definitions of existing print controls (for a new device type, for example) is simpler than adding a new print control. You need only edit the print controls in the device type in which they are required.

Do not change print controls in a standard R/3 device type. Do this only in a new device type or a copy of an R/3 standard device type.

Procedure: [Specifying Escape Sequences for Print Controls \[Page 272\]](#)



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Adding Print Controls to Standard Print Controls

If you want to create a new print control, you must first add it to the standard R/3 print controls.

1. Choose *Tools* → *CCMS* → *Spool* → *Spool administration*.
2. Then choose *Full administration*. Choose *Print controls* on the *DeviceTypes* tab page to display a list of the standard print controls.
3. Choose  *Change* and  *Create* or  *Create with reference*.
4. Enter a name and description for the print control. The name should start with Y or Z (the namespace reserved for customers).



SAP maintains the print control status fields as information for customers.



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Adding Print Controls to a Device Type Definition

Adding Print Controls to a Device Type Definition

To add new print controls to a copy of a device type, proceed as follows:

1. Select *Tools* → *CCMS* → *Spool* → *Spool administration* → *Full administration*. Enter the name of the device type in the *Device types* field and confirm your input.
2. Choose  *Print controls*.
3. Choose  *Std print controls* to select the print control you want to add to the device type definition.

Specifying escape sequences for print controls

Enter the attributes and control character sequence of the new print control.

- *Control character sequence*: Enter the appropriate printer command found in your printer manual.

You can enter the command either as:

- A hexadecimal string. In this case, be sure to select the *Hex* field.

If you work in a heterogeneous environment (ASCII hosts that use EBCDIC printers, or EBCDIC hosts that use ASCII printers), enter the control character sequence in hex, not as plain text. Hex values are not sent through the character set conversion, but are passed directly as entered to the target output device.

For an ASCII printer, enter the hex values for the ASCII string to be sent to the printer. For an EBCDIC printer, enter the hex values for the EBCDIC command string. For more information, see the note on maintaining print controls in mixed environments, below.

- Plain text. In this case, you can use the special characters (such as `\e` for escape) shown at the end of [Editing Device Types \[Page 255\]](#).

Be sure that the escape sequence you enter matches the meaning encoded in the print control name. For example, if you define `CI010`, then the escape sequence that you enter should configure the printer for character pitch 10.

If the escape sequence contains trailing spaces (spaces at the end of the string), then enter the escape in single quotation marks:

Notes

You can reach all of the utilities described in the following notes by choosing *Tools* → *CCMS* → *Spool* → *Spool administration*, *Full administration* and then *Print controls* (*DeviceTypes* tab page) and *Change*.

- **Which print controls do I need?** Are you defining the print controls for a new device type from scratch? If this is the case, see [Print Controls for List Output \[Page 274\]](#) and [SAPscript Print Controls \[Page 279\]](#) for lists of the print controls used by the SAP System.

You can also use a similar device type as a guide to the print controls needed. The set of print controls actually required by different devices varies considerably, so following an example from the R/3 standard can save you extra work and/or help you ensure that all required print controls are defined.

Adding Print Controls to a Device Type Definition

You do not need to define the complete set of standard print controls for a device type. Print controls that are not defined for a particular device type or which are defined with an empty *Control character sequence* field are ignored.

- **Copying:** You can copy the print controls from one device type to another. On the spool administration initial screen, choose *Utilities* → *For device types* → *Copy device type*.
- **Testing:** Test print controls by marking the device type you want to test from the list and choosing  *Print controls* and  *Test*. In the following screen, type in the names of the print control(s) that you would like to test along with a test text. (The control character sequences are inserted in the test screen when you choose *Enter*.)

Choose  *Print* to run the test. Print controls and texts are sent to the printer in the order in which they appear on the screen: <print control> <test text>.... You can therefore test sequences of print controls.

- **Printing print controls with definitions:** With *Utilities* → *For device types* → *Print PrCtrls*, you can print out the list of print controls defined for a device type. The list includes both the hexadecimal *Control character sequence* of each print control and the character representation of the control sequence. Enter the name of the device type in *Device type*; in *Print control* enter the name of the print control.
- **Print controls for printer fonts and bar codes:** Printer fonts and bar codes are defined in *SAPscript*. To make use of a printer font or bar code, you must also define a print control that selects the printer font or bar code. The name of each print control is determined in the *SAPscript* printer font/bar code definition.



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Print Controls for List Output

Print Controls for List Output

The list below shows the print control keywords that have been used in the SAP System in list printing.

Print controls are inserted in list output with the ABAP FORMAT and PRINT-CONTROL statements. List output is handled differently by the System depending upon whether a list is printed as it is being generated or directly from the display screen. If printed upon generation, then both PRINT-CONTROL and FORMAT print controls are used. If from the display, then only FORMAT print controls are used.

FORMAT and PRINT-CONTROL both use a variety of "built-in" print controls, print controls which are accessed by way of FORMAT or PRINT-CONTROL arguments. PRINT-CONTROL also offers the FUNCTION argument, with which any print control defined in the SAP spool system can be inserted into the output data.

Note that *SAPscript* uses its own private set of print controls when it formats text for output. These print controls are listed separately: [SAPscript Print Controls \[Page 279\]](#).

Standard ABAP Print Controls for List Printing

ABAP Statement	Print Controls Used by this Statement
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Print Controls for List Output

<p>FORMAT</p> <p>For more information, see the ABAP User's Guide [Ext.]</p>	<p>COL<xx>: Set list colors for color and halftone printing (SWIN driver and Microsoft Windows printers).</p> <p>The FORMAT statement and associated COL<xx> print controls supersede color setting with PRINT-CONTROL and CO00<n>.</p> <p>The R/3 standard includes these COL<xx> print controls:</p> <ul style="list-style-type: none"> • COL0H: Color off, font intensified • COL0N: Color off, normal font • COL0V: Color off, inverse font • COL1H: Title color, font intensified • COL1N: Title color, normal font • COL1V: Title color, inverse font • COL2H: Standard color, font intensified • COL2N: Standard color, normal font • COL2V: Standard color, inverse font • COL3H: Total color, font intensified • COL3N: Total color, normal font • COL3V: Total color, inverse font • COL4H: Key color, font intensified • COL4N: Key color, normal font • COL4V: Key color, inverse font • COL5H: Positive color, intensified font • COL5N: Positive color, normal font • COL5V: Positive color, inverse font • COL6H: Negative color, font intensified • COL6N: Negative color, normal font • COL6V: Negative color, inverse font • COL7H: Group color, font intensified • COL7N: Group color, normal font • COL7V: Group color, inverse font
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Print Controls for List Output

<p>PRINT CONTROL</p> <p>For more information, see the ABAP User's Guide [Ext.]</p>	<p>CI<dpi>: Character pitch (characters per inch)</p> <p>The character pitches in existing CI print controls are three digit numbers that are read without a decimal place. For example, character pitch 10 is represented by the control code CI010. The system reads the value as "10".</p> <p>The R/3 standard includes these CI print controls:</p> <ul style="list-style-type: none"> • CI005: 5 characters per inch (CPI) • CI008: 8 CPI • CI010: 10 CPI • CI012: 12 CPI • CI015 15 CPI • CI016: 16 CPI • CI024: 24 CPI
<p>PRINT-CONTROL</p>	<p>CO00<n>: Obsolete. Replaced by the COL<xx> print controls of the FORMAT instruction.</p> <p>When used, sets the color of text to one of the following supported colors:</p> <ul style="list-style-type: none"> • CO001: Black • CO002: Red • CO003: Blue • CO004: Green • CO005: Yellow • CO006: Pink
<p>PRINT CONTROL</p>	<p>LI< pi>: Leading (lines per inch) The leadings in existing LI print controls are three digit numbers that are read without a decimal place. For example, a leading of six lines to the inch is represented by the control code LI006. The system reads the value as "6".</p> <p>The R/3 standard includes the following LI instructions:</p> <ul style="list-style-type: none"> • LI006: Six lines per inch leading. This leading is used for defining page lengths in R/3 standard device formats for line printers. • LI008: Eight lines per inch leading.
<p>PRINT CONTROL</p>	<p>LM<nnn>: Left margin</p> <p>The value is in characters. Example: LM005 sets the left margin to five characters.</p>

Print Controls for List Output

<p>PRINT CONTROL</p>	<p>FO<nnn>: Selects a font or typeface. As implemented in the standard FO print controls, the command sets the following:</p> <ul style="list-style-type: none"> • The character set (such as ISO 10 Swedish), • The typeface (Courier or other fixed-width typeface) • The character pitch (characters per inch) • The character thickness (for example thin / bold) <p>The value of <nnn> in the name of an FO print control must correspond to the argument <nnn> given in the PRINT-CONTROL that uses the font.</p>
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Print Controls for List Output

<p>PRINT CONTROL FUNCTION argument (direct entry of a print control by name)</p>	<p>Since any print control can be invoked with PRINT CONTROL FUNCTION <pcname>, there is no comprehensive list of print controls that are invoked in this way in the standard SAP System.</p> <p>The following lists show R/3 standard print controls. If you are creating a new device type, use a related device type or one with similar capabilities, if possible, as a guide as to the print controls you will actually need to define.</p> <p>Bar codes: Used only in certain device types (such as those for Kyocera printers). Most bar code printing in R/3 is done in <i>SAPscript</i> using separate bar code print controls.</p> <ul style="list-style-type: none"> • BAROF: Ends bar code printing. • BARON: Starts bar code printing. • BC<nnn>: Prints a bar code. <nnn> must correspond to the actual name of the print control. Obsolete, should no longer be used. <p>Other print controls:</p> <ul style="list-style-type: none"> • RESET: Reset sequence for returning a printer to its standard settings. By preference, leave this print control empty and enter the required commands in the RESET AFTER EXIT action in your device formats. • SABLD: Starts boldface printing. Superseded by the COL<xx> print controls that are used with the ABAP FORMAT statement. You should still define the print control, however, to support older reports. • SAULN: Starts underlining. Superseded by the COL<xx> print controls that are used with the ABAP FORMAT statement. You should still define the print control, however, to support older reports. • SAOFF: Stops boldface printing and underlining. Superseded by the COL<xx> print controls that are used with the ABAP FORMAT statement. You should still define the print control, however, to support older reports. • SI<nnn>: Font size. The font sizes in existing SI print controls are three digit numbers which are read without a decimal place. There is no convention for entering font sizes at this time. Select SI001 for a normal font size, SI002 for a larger font.
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SAPscript Print Controls

Some of the print controls are reserved for SAPscript. The print controls that must be defined for a device type depend on the SAPscript printer driver that is to be used with the device type. The following objects display information about the print controls used by each driver.

[Print Controls for the Line Printer Driver STN2 \[Page 280\]](#)

[Print Controls for the HPL2 Driver for Hewlett Packard Printers PCL-4/PCL-5 \[Page 282\]](#)

[Print Controls for the Printer Driver PRES \(Kyocera PRESCRIBE\) \[Page 283\]](#)

[Print Controls for the Printer Driver POST \[Page 284\]](#)

[Description of all SAPscript Print Controls \[Page 285\]](#)



For information about using print controls in SAPscript, see [Adding Print Controls: PRINT CONTROL \[Ext.\]](#)



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Print Controls for the Line Printer Driver STN2

Print Controls for the Line Printer Driver STN2

Print Control	Function
S<nnnn>	Sets character set for a printer font. <nnnn> is the ID number of a code page defined in the SAP System. Example: 1100 is the ID number for the ISO 8859 Latin 1 code page.
S0000	Sets standard character set Recommendation: Define with empty <i>Control character sequence</i> unless you need to use this print control.
SBP<nn>	Bar code prefix; starts printing a bar code
SBS<nn>	Bar code suffix; ends printing of a bar code
SC<nnn>	Sets characters per inch (for example SC120 = 12.0 cpi)
SF<nnn>	Selects <i>SAPscript</i> printer font
SL<nnn>	Sets lines per inch (for example, SL080 = 8.9 lpi)
SLAND	Selects landscape printing mode
SLINE	Escape sequence for ending a line Recommended practice: Define SLINE with empty <i>Control character sequence</i> and put line-end processing in the <i>End of line</i> action in each device format.
SPAGE	Escape sequence for ending a page Recommended practice: Define SPAGE with empty <i>Control character sequence</i> and put page-end processing in the <i>End of page</i> action in each device format.
SPMSI	Starts simplex printing (front side of paper only). (Needed only if supported by device.)
SPMDU	Starts duplex printing (both sides of paper). (Needed only if supported by device.)
SPMTU	Begin tumble duplex printing (both sides of paper, top and bottom reversed on second sides). (Needed only if supported by device.)
SPMBS	Print on second side of sheet in duplex or tumble-duplex mode. (Needed only if supported by device.)
SPMFS	Print on first side of sheet in duplex or tumble-duplex mode. (Needed only if supported by device.)
SPORT	Select portrait printing mode

Print Controls for the Line Printer Driver STN2

SUB<<	Start printing subscripts
SUB>>	End printing subscripts
SUL<<	Start underlining
SUL>>	End underlining
SUP<<	Start printing superscripts
SUP>>	End printing superscripts
TRY01	Print from paper tray 1 at printer. (Needed only if supported by device.)
TRY02	Print from paper tray 2 at printer. (Needed only if supported by device.)
TRY03	Print from paper tray 3 at printer (reserved for future use). (Needed only if supported by device.)
TRYEN	Print an envelope. (Needed only if supported by device.)
TRYME	Use the manual envelope feed. (Needed only if supported by device.)
TRYMN	Use the manual paper feed. (Needed only if supported by device.)



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Print Controls for the Line Printer Driver STN2

Print Controls for the HPL2 Driver for Hewlett-Packard PCL-4/PCL-5 Printers

Print Control	Function
S<<<<	Initialization sequence Recommendation: Define with empty <i>Control character sequence</i> .
S<nnnn>	Set character set for a printer font
S>>>>	End-of-printing sequence Recommendation: Define with empty <i>Control character sequence</i> .
S0000	Set standard character set Recommendation: Define with empty <i>Control character sequence</i> unless you need to use this print control.
SBP<nn>	Start printing a bar code

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Print Controls for the Line Printer Driver STN2

Print Controls for the PRES (Kyocera PRESCRIBE) Printer Driver

Print Control	Function
S<<<<	Initialization sequence
S<nnnn>	Set character set for a printer font
S>>>>	End-of-printing sequence
S0000	Set standard character set Recommendation: Define with empty <i>Control character sequence</i> unless you need to use this print control.
SBP<nn>	Start printing a bar code
SBS<nn>	End printing a bar code
SF<nnn>	Select SAP <i>script</i> printer font
SPMBS	Print on second side of sheet in duplex or tumble-duplex mode(Needed only if supported by device.)
SPMDU	Begin duplex printing (both sides of paper) (Needed only if supported by device.)
SPMFS	Print on first side of sheet in duplex or tumble -duplex mode(Needed only if supported by device.)
SPMSI	Begin simplex printing (front side of paper only) (Needed only if supported by device.)
SPMTU	Begin tumble duplex printing (both sides of paper, top and bottom reversed on second sides) (Needed only if supported by device.)
TRY01	Print from paper tray 1 at printer(Needed only if supported by device.)
TRY02	Print from paper tray 2 at printer(Needed only if supported by device.)
TRY03	Print from paper tray 3 at printer (reserved for future use) (Needed only if supported by device.)
TRYEN	Print an envelope(Needed only if supported by device.)
TRYME	Use the manual envelope feed(Needed only if supported by device.)
TRYMN	Use the manual paper feed(Needed only if supported by device.)



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Print Controls for the Line Printer Driver STN2

Print Controls for the POST Printer Driver

Print Control	Function
S<<<<	Initialization sequence
S<nnnn>	Set character set for a printer font
S>>>>	End-of-printing sequence
S0000	Set standard character set Recommendation: Define with empty <i>Control character sequence</i> unless you need to use this print control.
SBP<nn>	Start printing a bar code
SBS<nn>	End printing a bar code
SF<nnn>	Select SAP <i>script</i> printer font
SPMBS	Print on second side of sheet in duplex or tumble-duplex mode
SPMDU	Begin duplex printing (both sides of paper)
SPMFS	Print on first side of sheet in duplex or tumble -duplex mode
SPMSI	Begin simplex printing (front side of paper only)
SPMTU	Begin tumble duplex printing (both sides of paper, top and bottom reversed on second sides)
TRY01	Print from paper tray 1 at printer
TRY02	Print from paper tray 2 at printer
TRY03	Print from paper tray 3 at printer
TRY04	Print from paper tray 4 at printer
TRYEN	Print an envelope
TRYME	Use the manual envelope feed
TRYMN	Use the manual paper feed



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Description of all SAPscript Print Controls

Description of all SAPscript Print Controls

SAPscript drivers use the following print controls:

Name	Meaning
S>>>>	<p>End of printing</p> <p>Sent at the end of output, after the <i>Reset after exit</i> action. Can be defined with an empty <i>Control character sequence</i>, since reset instructions belong in the <i>Reset after exist</i> action for the device format.</p>
S0000	<p>Resets a printer to a standard character set. This is the first character set specified in the device-type definition.</p> <p>This print control is issued in two cases:</p> <ul style="list-style-type: none"> • At the start of every output request • When a SAPscript printer font is selected the font family is not assigned to a R/3 character set. The previous font family has a character set. S0000 is set to reset the character set before the new SF<nnn> print control is sent <p>The standard character set is used for all output requests that have not been assigned a different R/3 character set.</p> <p>You can define S0000 with an empty <i>Control character sequence</i> if the SF<nnn> print controls select both the printer font and character set. The standard R/3 System is set up this way: Character set changes are executed using SF<nnn> print controls and S0000 is blank.</p> <p>Be sure to define the S0000 print control (even if the definition is empty). Otherwise, the spool system generates print-error logs reporting that the print control is missing.</p>

Description of all SAPscript Print Controls

S0001 - S9999	<p>Sets the character set required for a <i>SAPscript</i> printer font. <nnnn> is the spool system's ID number for a character set. Issued when a printer font is selected and a character set number (code page) has been assigned to the font family in <i>SAPscript</i>. Example: Font family OCRA, code page 4001. The instruction is sent just before the SF<xxx> print control, which selects the font.</p> <p>You can define these print controls with empty <i>Control character sequences</i> if the SF<nnn> print controls select both the printer font and character set. The standard R/3 System is set up this way: Character set changes are activated using SF<nnn> print controls, and the S<nnnn> print controls are blank.</p> <p>Be sure to define all standard S<nnnn> print controls (even if they have empty definitions). Otherwise, the spool system generates print-error logs reporting that the S<nnnn> print control is missing.</p>
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Description of all SAPscript Print Controls

SF<nnn>	<p>Use the SAPscript printer font designated by the ID number <nnn>. Sent whenever the font is changed. Use these print controls to set both the printer font and printer character set as required. You can then leave the S<nnnn> print controls empty. This simplifies maintenance of your device types.</p> <p>The SAPscript OTF drivers use these print controls to set the printer to the printer-specific font corresponding to the SAPscript font.</p> <p>To make an SF<nnn> instruction available to SAPscript, enter it for the corresponding font in the SAPscript font maintenance function: <i>Tools</i> → <i>CCMS</i> → <i>Spool</i> → <i>Font maintenance</i>.</p> <p>Non-proportional fonts: Note that the pitch specified in SAPscript font maintenance must match the actual pitch setting at the printer. Example: Font LNPRINT 85 is defined with CPI 15.00. The printer must therefore be set to 15 characters per inch.</p> <p>You should make it a practice to set the printer pitch along with the font in the SF print control.</p> <p>Proportional fonts: Note that the pitches at the printer must match the <i>Adobe Font Metrics</i> (AFM) data entered in SAPscript's definition of the font used. Only the SAPscript HPL2, PRES, and POST drivers support proportional fonts.</p> <p>You can use a test print to determine if the printer pitches are compatible with the AFM-metrics. Character spacing in the print out should be correct, neither too wide nor too tight nor uneven.</p> <p>OCR-A and OCR-B fonts: SAP has maintained SF print controls for switching to OCR printing for the device types shown in the following topic: Printer Types that Support OCR Printing [Page 140].</p>
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Description of all SAPscript Print Controls

SBP<nn>	<p>Bar code prefix, the escape sequence that must be sent before printing bar codes in a SAPscript form.</p> <p><nn> is an arbitrary number used to distinguish different types of bar codes.</p> <p>This bar code is maintained for all standard R/3 device types that support bar code printing. For a list of predefined bar codes, see Predefined Bar Codes [Page 149].</p> <p></p> <p>The PRES printer driver encloses the data marked by the SBP and SBS escape sequences in single quotation marks.</p> <p>The POST driver encloses the data marked by the SBP and SBS escape sequences in parentheses. This marks the data as a PostScript constant.</p> <p>The other printer drivers pass the bar code data without modification to the printer. If quotation marks or other markings are required for bar code data, then you must enter these as part of the SBP and SBS print control definitions.</p>
SBS<nn>	<p>Bar code suffix, the escape sequence that must be sent after printing a bar code.</p> <p><nn> is an arbitrary number used to distinguish different types of bar codes.</p> <p>This bar code is maintained for all standard R/3 device types that support bar code printing. For a list of predefined bar codes, see Predefined Bar Codes [Page 149].</p>
Duplex mode print controls	
SPMSI	<p>Begin simplex printing (front side of paper only) from the current page. If another mode was previously active, then the printer is switched to simplex mode at the start of the page and continues in this mode.</p>
SPMDU	<p>Begin duplex printing (both sides of paper). The current page is printed on the first side of a sheet in duplex mode. If another mode was previously active, then the printer is switched to duplex mode at the start of the page and then continues in this mode.</p>

Description of all SAPscript Print Controls

SPMTU	<p>Begin tumble duplex printing (both sides of paper, top and bottom reversed on second sides). The current page is printed on the first side of a sheet in tumble duplex mode. The printer continues printing in tumble-duplex mode. The page on the second side is always inverted, so that the footer of the second page is printed opposite the header of the first page.</p>
SPMFS	<p>Print on first side of sheet in duplex or tumble -duplex mode. For PostScript, define this print control with an empty <i>Control character sequence</i>.</p>
SPMBS	<p>Print on second side of sheet in duplex or tumble-duplex mode. For PostScript, define this print control with an empty <i>Control character sequence</i>.</p>
SPORT	<p>Switch to portrait mode at the start of a page.</p> <p>This instruction is sent to the printer at the start of every page printed in portrait mode.</p> <p>You only need to maintain this print control for printers that can switch modes (page printers). You can define the print control with an empty <i>Control character sequence</i> where it is not needed (for printers that do not support portrait printing and for line printers that print on continuous-feed paper).</p>
SLAND	<p>Switch to landscape mode at the start of a page.</p> <p>This instruction is sent to the printer at the start of every page printed in landscape mode.</p> <p>You only need to maintain this print control for printers that can switch modes (page printers). You can define the print control with an empty <i>Control character sequence</i> where it is not needed (for printers that do not support landscape printing and for line printers that print on continuous-feed paper).</p>
SLINE	<p>Line end command, sent at the end of every line except the last line on a page.</p> <p>Normally set to CARRIAGE RETURN, LINEFEED (hexadecimal \$0D \$0A).</p> <p>You have the option of defining this print control with an empty <i>Control character sequence</i> and then entering CR LF in the <i>End of line</i> action in your device type formats. Both <i>SLINE</i> and <i>End of line</i> are issued at the end of each output line</p>

Description of all SAPscript Print Controls

SPAGE	<p>Command for ending a page, sent at the end of the last line on a page.</p> <p>Normally set to CARRIAGE RETURN, FORMFEED (hexadecimal \$0D \$0C).</p> <p>You have the option of defining this print control with an empty <i>Control character sequence</i> and then entering CR LF in the <i>End of page</i> action in your device formats. Both <i>SPAGE</i> and <i>End of page</i> are issued at the end of each output page.</p>
SUL<<	Activates underlining
SUL>>	Deactivates underlining
SUP<<	Activates superscript
SUP>>	Deactivates superscript
SUB<<	Activates subscript
SUB>>	Deactivates subscripts
SL<ab.c>	<p>Set the initial line feed to AB.C lines per inch. Note that <i>SAPscript</i> does not use LI print controls.</p> <p>Enter a line feed as a three digit number. The last digit is read as the first decimal place. For example, a line feed of 6 lines per inch is represented by the print control SL060. The system reads the value as "6.0".</p> <p>You must ensure that SL060 is defined, as all <i>SAPscript</i> forms use this setting. Only enter other values if they are supported by an output device. SL080 and SL040 are usually supported, for example.</p>
SC<ab.c>	<p>Sets the initial pitch to AB.C characters per inch. Note that <i>SAPscript</i> does not use CI print controls.</p> <p>Enter pitches as three-digit numbers. The last digit is read as the first decimal place. For example, 10.0 characters per inch is represented by the print control SC100. The system reads the value as "10.0".</p> <p>You must ensure that SC100 is defined, as all <i>SAPscript</i> forms use this setting. You only need to maintain other pitches if an output device supports them. SC120 and SC150 are usually supported, for example.</p>

Description of all SAPscript Print Controls

Print controls for paper tray selection	You should define all of these print controls in a new device type, as the SAPscript OTF drivers may call any of them. If one is missing, then the driver puts an error message in the output request log. Define those TRY print controls that your printer cannot support, with an empty <i>Control character sequence</i> . They will then be ignored.
TRY01, TRY02, and TRY03...	Switch to a particular paper tray at a printer
TRYEN	Print an envelope
TRYME	Switch to manual envelope feed
TRYMN	Switch to manual paper feed



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Creating Page Formats

Creating Page Formats

To define a new page format, choose *Tools* → *CCMS* → *Spool* → *Spool administration*. Then choose *Full administration* and then *Page formats* on the *DeviceTypes* tab page. On the next screen choose  *Change* and  *Create* or  *Create with reference*. Fill in the fields on the next screen.

Activating a New Page Format

Before using a new page format, you must specify it as a page format in an *SAPscript* form. Be careful when replacing a page format in a standard *SAPscript* form as the form may not necessarily fit on the new page format.

You also have to define a [format \[Page 257\]](#) and [device type format \[Page 262\]](#) for the new page format before you can use it.

Notes

- Every page format used by *SAPscript* must be defined using this function. In addition, note the following two requirements:
 - AN SAP spool system format must exist for every page format used by *SAPscript*.
 - The name of the page format must be identical to the name of the format.SAP supplies predefined page formats and formats for all standard *SAPscript* forms.
- Do not change the dimensions or orientation in existing standard R/3 page formats. This may cause errors during printing of *SAPscript* forms.
- The page dimensions and orientation you specify in a page format do not directly affect a printer. That is, neither *SAPscript* nor the spool system automatically translates the specifications into escape sequences for initializing the printer.

Therefore, ensure that the orientation and dimensions you specify here agree with the orientation, margin settings, and other characteristics (if any) specified in the escape sequences for each device type format with which the page format is used.



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Modifying the SWIN (SAPWIN) Device Type

The SWIN device type allows you to use any printer or fax that the Microsoft Windows Print Manager can use, regardless of whether or not a device type for the printer/fax has been defined in the SAP System. In this case, it is actually the Microsoft Windows Print Manager and Windows driver that format a document producing an output-ready data stream.

Modifying SWIN is a little bit different than working on other device types because SWIN does not deliver an output-ready data stream. Rather, it converts the R/3 internal document format into a special R/3 formatting language. The SAPIpd transfer program understands this formatting language. SAPIpd, in turn, converts the R/3 formatting commands into Windows GDI commands, which the Print Manager and the Windows device driver can use for preparing print-ready output data.

This means that rather than modifying printer commands in actions and print controls, you use R/3 formatting commands. The SWIN/SAPIpd formatting language is documented in this section.

SWIN Device Format Actions

With *SAPscript* formats, SWIN does not use the *Printer initialization* or *Reset* actions. Enter a comment line -- **# Not used** -- in these two actions in the *SAPscript* device formats of your copy of SWIN. This ensures that the actions will be ignored when they are called during output. SWIN list formats do use the *Printer initialization* and *Reset* actions.

In your copy of SWIN, insert commands only in the device format actions that the R/3 standard SWIN uses.

Changes Frequently Made to SWIN

- **Adjusting the position of output on the paper.**

In an *SAPscript* form definition, positioning information refers to the absolute dimensions of the paper to be used for outputting the form. At run time, however, the positioning information in *SAPscript* forms is added to the coordinate system of the target output device to determine where on the output page the objects in the form are actually to appear.

Since output devices use different origins for their coordinate systems, *SAPscript* and the spool system must offer a way to adjust form positioning to reflect the coordinate system used by an output device.

You can adapt your forms to the differing coordinate systems of output devices in the device definition, which provides the SAP spool system with information about individual printers and fax devices.

To set the fields: Choose *Tools* → *CCMS* → *Spool* → *Spool administration*, change the appropriate output device, and go to the *Output attributes* tab page. There, you can set the horizontal positioning in *Horizontal move*, the vertical positioning in *Vertical shift*. Positive values (> 0) move the output down or to the right. Negative values in the format xxx move the output up or to the left. No decimal values are permitted. For exact positioning, use MM (millimeters) or PT (points, 10 points / inch).



If a window in a form definition is to appear 1 cm from the left edge of the paper, then on a Hewlett-Packard LaserJet printer, the window will actually be printed 1.5 cm

Modifying the SWIN (SAPWIN) Device Type

from the left edge of the paper. The LaserJet starts its X-axis coordinate system 0.5 cm from the left edge of the paper. On a PostScript printer, on the other hand, the window will actually appear 1 cm from the left edge of the paper, because PostScript uses the physical boundaries of the paper for its coordinate system.

You can adjust the positioning of the output on the HPLJ4 (LaserJet) printer by entering -5 mm in the *Horizontal move* field in the second screen of the device definition of each HPLJ4 printer.

- **Setting basic list-printing characteristics: Character pitch, line leading, type size.**

To make these adjustments, you need to change the *Printer initialization* action in the X_ formats in your copy of the SWIN device type.

There, you can adjust the character pitch (character spacing), leading (line spacing), and type size using the following commands:

Characteristic	SWIN Formatting Command to Use
Character pitch	<code>\ec<nn.n></code> where <nn.n> is the number of characters per inch. Example: <code>\ec100</code> sets the pitch to 10 characters per inch.
Leading	<code>\el<nn.n></code> where <nn.n> is the number of lines per inch. Example: <code>\el060</code> sets the leading to 6 lines per inch.
Type size	<code>\eS<nnn>X</code> where <nnn> is the type size in twips (20 twips = 1 point). Example: <code>\eS200X</code> sets the type size to 10 points (200 twips / 20 = 10 points).



The SWIN data stream protocol is an internal R/3 format that may change without prior notice. SAP intends to make only upwardly compatible changes to the SWIN protocol. That means that you should always be able to use the newest version of SAPIpd, even if you have not upgraded your SAP System itself.

SAP guarantees, however, only that the SWIN device type will function correctly with the development level of the SAPIpd transfer program specified for a particular R/3 Release.

For more information about the SWIN protocol, see SAPNet.



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Frequently Made Changes to Device Types

Customizing the cover page. Do the following:

1. [Copy the device type \[Page 254\]](#). Select *Use references* so that the device format actions reference the R/3 standard device type.
2. Do your customizing in the *Cover page* action in the *X_PAPER* device format of the copied device type. If you want, you can override the default *X_PAPER* cover page by defining *Cover page* actions for other formats. More information: [Maintaining Cover Pages for Output Requests \[Page 239\]](#).
3. Use your new device type in place of the R/3 standard in *Output device* definitions in your SAP System. See [Connecting a Printer or Fax to a Microsoft Windows System \[Page 66\]](#).

Adding a format for a new paper size or list output format. Do the following:

1. [Copy the device type \[Page 254\]](#). Select *Use references* so that the device format actions reference the R/3 standard device type.
2. Define a new [Page format \[Page 292\]](#), [Format \[Page 257\]](#), and [Device format \[Page 262\]](#) to implement the new paper size or list output format. Use the copied device format actions from a similar device format to save work in defining the actions.
3. Make the new paper size available in the system by entering it in the appropriate *SAPscript* forms (*SAPscript Form Painter*) and ABAP reports (REPORT specifications or NEW PAGE PRINT ON LAYOUT statements).

Modifying SWIN printing. Do the following:

1. [Copy the device type \[Page 254\]](#). Select *Use references* so that the device format actions reference the R/3 standard device types.

Modify [the SWIN Device Type \[Page 293\]](#).



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Transporting Device Types

Transporting Device Types

You can transport a device type definition using the R/3 organizer or spool administration (report RSTXSCR).P).

In the latter method, the SAP System downloads an R/3 device type in ASCII file format to the file system of the host system on which the report is run. To complete the transport, you then use the report to upload any such file into another SAP System.

Transporting a device type from one SAP System to another copies all of the following components:

- The device type
- All components belonging to the device type, such as print control definitions, device formats, and *SAPscript* fonts. Only device type definitions and not definitions of individual printers are transported. To transport a device name definition or device identification, see [Transporting Output Devices \(Device Definitions\) \[Page 298\]](#).

Procedure

1. Download the definition from the "source" SAP System.
 - a) Choose *Tools* → *CCMS* → *Spool* → *Spool administration* and then *Utilities* → *For device types* → *Export*.
 - b) Select *Device type* and then enter the following:
Object name: <device type name>
Mode: **Export**
Dataset name: <path name>

Path and file name for the download file. Omit the file name extension. The download file is automatically given the extension .pri. The SAP System must have write access to the directory you specify.
2. Upload the definition into the "destination" SAP System. If the "destination" application server is on another host system than the "source" server, the download directory must be accessible from the host system of the "destination" server.
 - a) Choose *Tools* → *CCMS* → *Spool* → *Spool administration* and then *Utilities* → *For device types* → *Import*.
 - b) Select *Device type* and then enter the following:
Object name: <device type name>
Mode: **Export**
Dataset name: <Path_name>

Path and file name of the file that is to be uploaded. Do not use any path extensions, the file automatically contains the extension .pri. The SAP System must have write access to the directory you specify.



RSTXSCR in IMPORT mode overwrites existing device type definitions. Data loss (overwriting an R/3 standard printer definition or a definition of your own) is possible.



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Transporting Output Devices (Device Definitions)

Transporting Output Devices (Device Definitions)

You can transport a printer name definition by choosing *Edit* →  *Transport*.

Transporting a printer name definition transports only the identification of a particular printer, fax, or other device. It does not transport the device type. For help with transporting a device type, see [Transporting Device Types \[Page 296\]](#).



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Maintaining Character Sets

The SAP System manages its own character sets. These character sets specify:

- Which characters a particular printer or screen display routine can output
- The hexadecimal code to use to send a character to a printer or display routine.

The following topics describe how to maintain character sets in spool administration.

In general, you only need to maintain character sets when you add a new device type to the SAP System. To maintain character sets, do the following:

- Identify the manufacturer of the character set using [Character Set Manufacturers \[Page 301\]](#).

You only need to perform this step if the manufacturer of the character set is not already identified in the spool system.

- Define the character set required by the printer using [Character Sets \[Page 302\]](#).

To do this, you must:

- Identify which characters are in the character set using their R/3 ID numbers
- Enter the binary code for each character, as required by the printer or display routine.

The easiest method for defining a character set is to copy the existing character set that most closely matches the new character set. Then add or delete characters as necessary to customize the character set.



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Displaying Characters

Displaying Characters

If you are not sure which character a definition describes, display the character in *SAPscript* using its character ID.

Procedure

Choose *Utilities* → *SAPscript* → *Standard text*. Enter any text name and choose *Create*. In the text editor, choose *Edit* → *Insert command*. Select *SAP characters* and enter the number of the SAP character you want to display, in the field. Then choose *Print preview*.



Entering <164> and printing or displaying the text displays the character, if any, specified for character ID 164. You will see the pound sign '#' if the character is not defined in the system or in the output character set.



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Defining a Manufacturer

The spool system uses the name of the manufacturer of a character set for documentary purposes to help identify the character set.

You need to define a manufacturer only if it has not been already been defined.

To define a character set manufacturer, choose *Character set manufacturers* on the *Char. sets* tab page. Enter a freely selectable name for the manufacturer. You can add a descriptive text as well, if desired.



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Defining Character Sets

Defining Character Sets

Defining a character set makes the character set available for use in the spool system. You link a character set to printers or online display routines by:

- Entering the character set name in a device-type definition. The spool system uses the character set to generate an output stream for the output device.
- Selecting the character set in an *SAPscript* SF<nnn> print control. *SAPscript* can then select the character set. You must also define the font and specify its font metrics in *SAPscript*. The SF<nnn> print control is associated with the *SAPscript* font definition. In addition, you must also adjust the form to use the new font.

You only need to define a character set when you add a new output device to your system, and the output device requires a character set that is not yet supported by the SAP System.

To define a character set, choose *Tools* → *CCMS* → *Spool* → *Spool administration* → *Full administration* → *Character sets* on the *Char. sets* tab page. Defining a character set is a two-step process:

1. First, define the character set by choosing *Create* or *Create with reference*.
2. Then, assign characters to the character set using their R/3 ID numbers. Choose *Character set* → *Edit character set*.
3. If the character set is required on more than one instance (a distributed system), you must update the character set cache on the other instances (those that you are not currently working on).

Entering a Character Set Definition

To define a character set, you must fill in the following fields. For information about what to enter, see your printer or character set documentation.

- *Character set*: A four-digit number for the character set. Enter a 9xxx number; numbers beginning with 9 are reserved for customer use.

The complete naming convention is as follows:

- First number: Code
 - 0 EBCDIC character sets
 - 1 ASCII character sets
 - 2 Mixed single-byte / double-byte character sets
 - 4 Double-byte character sets
 - 6 Mixed character sets
 - 8 Double and multi-byte character sets
 - 9 Reserved for code pages that you define.
- Second number: Country
 - 1-3 Countries that use the Latin alphabet (Western Europe, North and South America, Australia, Africa)

Defining Character Sets

4-6 Countries that use non-Latin alphabets and font systems (Eastern Europe, Asia, Arabic countries in Africa)

7-9 Reserved for special languages.

- Third and fourth numbers: a sequential number

Examples:

0100 IBM 00697/00273 (Latin-1 Germany / Austria)

0401 SNI BS2000 8859-5 EHCLC (multilingual Cyrillic)

Edit the remaining fields as described in the field help. The system updates a *Version* counter each time you save a character set.

Specifying Characters For a Character Set

Specify the characters for a character set by entering the R/3 ID number of each character in the *ChrNo* field of the *Edit Character Set* screen.

For each character, you must also enter the value with which the character is to be represented in an output stream. Enter the value as one or more hexadecimal bytes in the *X1-X4* fields. You can find the hexadecimal values for characters in your printer or character documentation. Print a character set by choosing *Utilities* → *For character sets* → *Print character set*.



Required characters: You must define these characters in any new character set:

1	R/3 print controls (identification character for print controls, internal hexadecimal value 1C)
32	Space (for SAPscript printer drivers)
35	Number sign

Activating a Character Set

Character sets are held in a cache in shared memory. When you add or change a character set, this cache is refreshed only on the instance (application server) on which you made the change and on any instances where a spool work process or spool formatting program is active.

To refresh the character set on other instances, use any of the following methods:

- Invalidate the character set cache by selecting *Spool* → *TemSe administration*. Then select *Character sets* → *Conv. buffer (CCC)* → *Invalidate CCC*.
- Invalidate the character set cache on each instance on which the character set is required using the R/3 command **rstsmain ict**.
- Restart each instance.

You must also update the separate character set cache used by SAPscript. To do this, run report RSTXDELL once for each client in your system.



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Defining Character Sets

Displaying and Printing Character Sets

The spool system offers the following tools for displaying and printing character sets:

- To display a character set as it is defined in the SAP System, choose *Tools* → *CCMS* → *Spool* → *Spool administration* → *Utilities* → *For character sets* → *Output character set*. The character set is displayed in list format on the screen.

When the system displays a character set upon the screen:

- Several characters cannot be displayed on the screen. These are: the space, the R/3 print control prefix character, and the special OCR characters "hook", "chair," and "fork".

The locations of these characters in the character set are indicated using footnotes.

- Characters not in the system character set cannot be displayed

These characters are displayed using the pound sign "#". You can determine which characters these are using the description displayed.

Example: Double-byte characters such as line-draw characters or certain language-specific characters are not included in the standard system character set. These characters are displayed using the pound sign #.

- To print out the character set defined for a particular output device, choose *Tools* → *CCMS* → *Spool* → *Spool administration* → *Utilities* → *For character sets* → *Test data (chars)*.

The function displays the R/3 device type of the output device and the ID of the R/3 character set used by the device. The characters included in the printer character set are stored as a spool request. To print the character set, send the spool request to the printer.



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Uploading Font Metrics Data for SAPscript

Uploading Font Metrics Data for SAPscript

The SAP System is delivered with the font metrics data that is required for all standard *SAPscript* forms. You will only need to upload font metrics data if the following are true:

- You want to use a typeface that is not included in the standard SAP System.
- You alter an *SAPscript* form or create your own form and printing program to use your special typeface.

Uploading font metrics makes them available to *SAPscript* for filling text during output.

Prerequisites

There are two ways to upload font metrics. The method to use is determined by the type of font metrics information available to you.

If you have the following:

- An .afm font metrics files in Adobe™ Font Metrics ASCII format, then use the *SAPscript* [Load AFM File \[Page 307\]](#) function to upload the font metrics.

An ASCII-format.afm file is not usually delivered with a special font that you purchase. However, the manufacturer of your font should be able to supply you with these files on request. Usually, you will receive a set of four .afm files, one for each combination of the attributes bold/non-bold, italics/normal.

- Any font that is installed in Microsoft Windows (for example, any TrueType© font, any printer font that you have installed in Windows), then use the [SAP/pd/RSTXLMET method \[Page 309\]](#) for uploading font metrics.

You can use this method to make a Windows font available for R/3 printing.

For correct printing results, you will probably have to use a Windows PC to print output that uses the uploaded font. Even if the font is available elsewhere – in a UNIX workstation for example – the Windows font metrics may not be exactly right for the other environment.



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SAPscript Load AFM File Function

1. Copy the *.afm file(s) (ASCII format) to a directory that is accessible from the frontend computer you are working on.
2. Create an SAPscript font family for the font, if one does not already exist. Choose *Tools* → *CCMS* → *Spool* → *Font maintenance*, then *Font families* and *Change*. Choose *Create* to add a new font family. You can use any name you want for the font family.

Leave *Substitute family* fields blank unless there is an alternative R/3 font family to this one. The substitute family is used in the event that this font is not defined in the target device type of an output request.

For *Character set*, enter the number of the R/3 character set to use for printing this font. This should be the character set that is used by the target output device. Example: Enter 1705 for a printer that outputs Greek characters.
3. Then return to the initial font maintenance screen. Choose *Printer fonts/AFM metrics* and *Change*.
4. Position the cursor on the device type (printer) for which the font metrics are intended. (Fonts and font-metrics are device-specific.) Do not change the original SAP device types, but create your own by making a copy.
5. Choose *Load AFM File*, enter the path name of the .afm file in the upload dialog window, and choose *Transfer* to upload the file.

The system asks you to create a transport request. Use this request to transport the new font to other SAP Systems

When the file upload is complete, the system displays a dialog window: *SAPscript Font Maintenance: AFM file uploaded*.
6. Acknowledge the message. Fill out the fields in the dialog box displayed. Mark the attributes (bold and italic) as appropriate for the file that you have uploaded.

For the font size, enter 000 if the font is to be used with the POST, SWIN, or HPL2 OTF drivers. 000 means that this font is scaleable and these printers are all capable of using the AFM data to scale the font to any required size. For devices that use other OTF drivers (STN2 and so on), upload the AFM files separately for each font size that you need. For this, specify the actual font size.

Finally, enter a unique name(s) for the print controls that are to be used to switch to this font in portrait and landscape mode. The names must have the format SF<xxx> and must be unique among the print controls for the current device type. For information about defining and using these print controls, see the F1 field help.

If you entered font size 000, select *Scaleable font*.
7. Choose the device type (F2) to open the list of printer fonts. The new font that you have uploaded should appear in the list.
8. Generate the font. Choose *Edit* → *Generate font*.

If the system displays the message *PostScript character xxxx is unknown*, this means the uploaded information included a character R/3 could not identify. Either delete this character from the uploaded font or substitute the character name that SAP uses for the character.

SAPscript Load AFM File Function

Try to find the character among the characters supported by SAP. To display the SAP character definitions, create a new R/3 session and choose *Tools* → *CCMS* → *Spool* → *Spool administration*. Then choose *Full administration* and *SAP Characters*.

If you find an equivalent SAP character, then choose *Edit metrics* in the *Change printer fonts* screen. Replace the unknown original name of the character with the R/3 name. The character can now be printed from the SAP System.

If you do not find an equivalent character, delete the unknown character from the uploaded font metrics. The character cannot be printed from R/3. Choose *Edit metrics* from the *Change printer fonts* screen. Then delete the line that defines the character. Also reduce the number of characters that appears at the beginning of the AFM file.

Repeat this step until all unknown characters have been substituted or deleted and the font has been successfully generated.

9. Repeat the upload procedure until you have added all of your *.afm files. You only need to create the font family once.

10. Specify the print controls for switching to this font in portrait and landscape mode.

For more information about the printer commands the print controls should contain, see the F1 field help for the print controls. For general help in defining print controls, see [Specifying Escape Sequences for Print Controls \[Page 272\]](#).

11. Your font is now ready for use.



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SAPlpd / RSTXLMET Methods

1. Start or log on to the PC where the font is installed. (The font is only printed correctly on the PC where it is installed.)
2. Start the print manager. Then open the *Properties* window of the printer where the font metrics are to be produced. (Font metrics are device-specific, even for TrueType fonts. Variations in standard fonts between device types are usually minimal.)

Set the printer to the highest supported resolution (for example, 600 DPI). Higher resolutions increase the accuracy of the font metrics that SAPlpd generates.

3. Open a DOS command prompt window.
4. Generate the font metrics file. In the DOS window, enter the command:

```
saplpd -i<italics bold> -p<Printer name in Windows Print Manager>  
- m<Windows font name>
```

The options are as follows:

- **-i<italics bold>**: Specify the attributes of the font using the value 0 for normal, and 1 for attribute on. Example: `-i00` for normal characters, `-i01` for bold characters, `-i10` for italics, `-i11` for bold italics.
- **-p<printername>**: Enter the name of the printer where the font is to be used. Find the name in the Windows Print Manager.
- **-w<WinCharSet>**: The value for the Windows character set you want to display (for example, 0 for ANSI characters). You can upload single-byte and double-byte fonts with set character widths. See also, [Setting the Character Set for SWIN and SAPlpd \[Page 84\]](#).
- **-m**: The name of the font exactly as it appears in the Windows font manager.

Search for SAPlpd if you cannot find it. It is located in the directory of the SAP GUI frontend software.

The command generates an ASCII-format font metrics file called SAPlpd.MET.

Repeat this step until you have created four files, one for each of the `-i` variants.



For an example of a Windows *.bat file used to automate this step, see [Sample *.bat File for Generating Windows Font Metrics Files \[Page 312\]](#).

5. Log on to the SAP System where the font metrics are to be uploaded.
6. Create an SAPscript font family for the font, if one does not already exist. *Tools* → *CCMS* → *Spool* → *Font maintenance*, then *Font families* and *Change*. Choose *Create* to add a new font family. You can use any name you want for the font family.

Leave *Substitute family* fields blank unless there is an alternative R/3 font family to this one. The substitute family is used in the event that this font is not defined in the target device type of an output request.

SAPIpd / RSTXLMET Methods

For *Character set*, enter the number of the character set to use for printing this font. This should be the character set that is used by the output device. Example: Enter 1704 for a printer that outputs Greek characters.

7. Create an SAPscript printer font for the font you are uploading. Return to the initial font maintenance screen. From there, choose *Printer fonts/AFM metrics* and *Change*. (Choose *Tools* → *CCMS* → *Spool* → *Font maintenance*. Then choose *Printer fonts/AFM metrics* and *Change*).
8. Position the cursor on the device type (printer) for which the font metrics are intended. (Fonts and font-metrics are device-specific.)
9. Choose the device type (F2) to open the list of printer fonts. Choose *Create* to define the new font you are uploading.

Fill out the fields in the dialog box displayed. Select the attributes (bold and italic) appropriate for the file you uploaded.

For the font size, enter 000. 000 means that this font is scaleable. Leave the *Characters per inch* setting at the default 10.00.

Finally, enter a unique name(s) for the print controls to be used to switch to this font in portrait and landscape mode. The names must have the format SF<xxx> and must be unique among the print controls for the current device type. See the F1 field help for details on the definition and usage of these print controls.

If you entered font size 000, select the *Scaleable font* box.

Save the font and return to the initial SAP System screen.

10. Choose *Tools* → *ABAP Workbench* → *ABAP Editor*. In *Program*, enter **RSTXLMET**. Then choose *Execute*.

In the selection screen, enter the R/3 device type for which the font is intended in the *Printer* field. The device type you enter must use the SWIN OTF printer driver.

Enter the name and character set of the font family you created in step 6. Only enter the code page if you could not specify a corresponding WinCharSet value for your font in step 4.

Select *LISTAFM* to list the result of the upload. Also select *UPDATE*.

In the dialog box displayed, confirm you want to save the font.

Exit the report and return to the initial R/3 screen.

11. Choose *Tools* → *CCMS* → *Spool* → *Font maintenance* and then *Printer fonts/ AFM metrics* → *Change*. Choose the device type (F2) to open the list of printer fonts. Place the cursor on your new font, and choose *Edit* → *Generate font*.

If the system displays the message *Character xxxx is unknown*, this means that the uploaded information included a character that R/3 could not identify. Either delete this character from the uploaded font or substitute the character name that SAP uses for the character.

Try to find the character among the characters supported by SAP. To display the SAP character definitions, create a new R/3 session and choose *Tools* → *CCMS* → *Spool* → *Spool administration*. Then choose *Full administration* and *SAP character set* on the *Char. sets* tab page.

SAPLpd / RSTXLMET Methods

If you find an equivalent SAP character, then choose *Edit metrics* in the *Change printer fonts* screen. Replace the unknown original name of the character with the R/3 name. The character can now be printed from the SAP System.

If you do not find an equivalent character, delete the unknown character from the uploaded font metrics. The character cannot be printed from R/3. Choose *Edit metrics* from the *Change printer fonts* screen. Delete the line containing the definition of that character. Also reduce the number of characters that appear at the beginning of the AFM file.

Repeat this step until all unknown characters have been substituted or deleted and the font has been successfully generated.

12. Repeat steps 7 through 11 until all of the SAPLpd files have been uploaded.

13. Specify the print controls for switching to this font in portrait and landscape mode.

For more information about the printer commands the print controls should contain, see the F1 field help for the print controls. For general help in defining print controls, see [Specifying Escape Sequences for Print Controls \[Page 272\]](#).

Result

The new font you have added to the SAP System is now available for printing SAPscript documents.



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Sample *.bat File: Generating Windows Font Metric File

Sample *.bat File: Generating Windows Font Metric File

```
* Generate font metrics files for TrueType© Times New Roman
* Start with normal text...
saplpd -p __DEFAULT -i00 -w %1 -m Times New Roman
* Rename the file so that it is not overwritten....
ren saplpd.met times%1
* Continue with Times New Roman italics, and so on...
saplpd -p __DEFAULT -i10 -w %1 -m Times New Roman
ren saplpd.met times%1.i
saplpd -p __DEFAULT -i01 -w %1 -m Times New Roman
ren saplpd.met times%1.b
saplpd -p __DEFAULT -i11 -w %1 -m Times New Roman
ren saplpd.met times%1.ib
```



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Spool Servers

A spool server is a R/3 application server on which one or more spool work processes are running. Add the profile parameter `rdisp/wp no spo` to the instance profile of the relevant server (*Tools* → *CCMS* → *Configuration* → *Profile maintenance*) and enter the desired number of spool work processes.



For information about setting up front-end printing, see [Frontend Printing on Local Printers \[Page 23\]](#).

Classifying Servers, Using Logical and Alternate Servers

Choosing *Tools* → *CCMS* → *Spool* → *Spool administration* → *Spool servers* on the *Devices / servers* tab page, you can specify the following attributes and administration information for spool servers:

- **Server classification:** You can classify the spool server according to its intended use: Production printing, test printing, high-volume printing, and so. These classifications correspond to our recommendation for organizing the output architecture for optimum performance. The classification helps you to enforce your organization of printers as you define new printers.
- **Alternate servers:** You can specify a "substitute" server for a spool server. The alternate server takes over the processing of output requests if the original server is down or unavailable. For more information, see [Alternate Servers \[Page 318\]](#).
- **Logical servers:** To help you organize your printing architecture and manage printers, you can define logical servers. These let you, for example, define a spool server structure as the standard in one SAP System and transport the structure with only minimal changes to other SAP Systems. For more information, see [Logical Servers \[Page 316\]](#)
- **Load balancing:** You can specify whether the output processing workload of a server may be distributed among its alternate servers. By default, load balancing is inactive. Instead, the spool system assures that output requests are printed in the order that they are generated.

Procedure: [Defining Spool Servers \[Page 314\]](#).



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Defining Spool Servers

Defining Spool Servers

Procedure

- 1. Start the function.** Choose *Tools* → *CCMS* → *Spool* → *Spool administration, Full administration* and then *Spool servers* on the *Devices / servers* tab page.
- 2. Select a server.** In the list, choose *Change* and then choose the spool server for which you want to specify or change administration information.

The list shows all real spool servers in your SAP System as well as any logical servers you have defined. The color-coding in the list indicates the status of each server and whether the server is available for output-processing. For an explanation of the colors, see [Interpreting the Spool Server Display \[Page 321\]](#).

To create a new definition for a logical server, choose *Change* and then *Create* or select a new server and choose *Create with reference*.
- 3. Name the server,** if this is a new entry. In the shorter *System name* field, enter a name for the new logical server you are creating.
- 4. Define the server's attributes.** In the *Attributes* field, specify the options you want to use. All attributes are optional.
 - **To classify a server:** Choose the appropriate value from *Possible entries* for the *Server class* field.

The system will test this value against the classification of devices you assign to this server. It will warn you if the classifications do not match. For example, you will be warned if you try to assign a high-volume printer to a production print server.
 - **To specify an alternate server:** Enter the name of a logical or real server in the *Alt server* field.

If the server you are defining is inactive or does not have a spool work process, then the SAP System uses this specification to find another spool server to carry out output processing.
 - **To define a logical server:** Select *Logical server*. Then choose *Enter*.

In the *Mapping* field, specify the real or logical server to which this logical server should refer.

The spool system "maps" the logical server name to the server in *Mapping*. Because this "mapping" is recursive, you can specify either a real server or another logical server.
 - **To activate load balancing:** Select *Allow load balancing*. Load balancing makes the most sense if you set up logical servers and order your servers in *Mapping* and/or *Alternate server* hierarchies.
- 5. Save the spool server definition** and choose *Back* to return to the server display. Here, you can use the server display functions to see how your servers are linked to one another through the *Mapping* and *Alternate server* fields.

For help interpreting and manipulating the display, see [Interpreting the Spool Server Display \[Page 321\]](#).

Result

If you have defined a logical server, you now can enter it as a spool server anywhere in the spool system (in device definitions, for example). Using logical servers in place of or in addition to real servers offers benefits such as load balancing and use of a standardized printing architecture across SAP Systems.

If you have defined a real server, you have assigned attributes to one of your R/3 servers. These attributes, such as a classification or an alternate server, can help you manage your printing architecture and improve reliability.



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Logical Servers

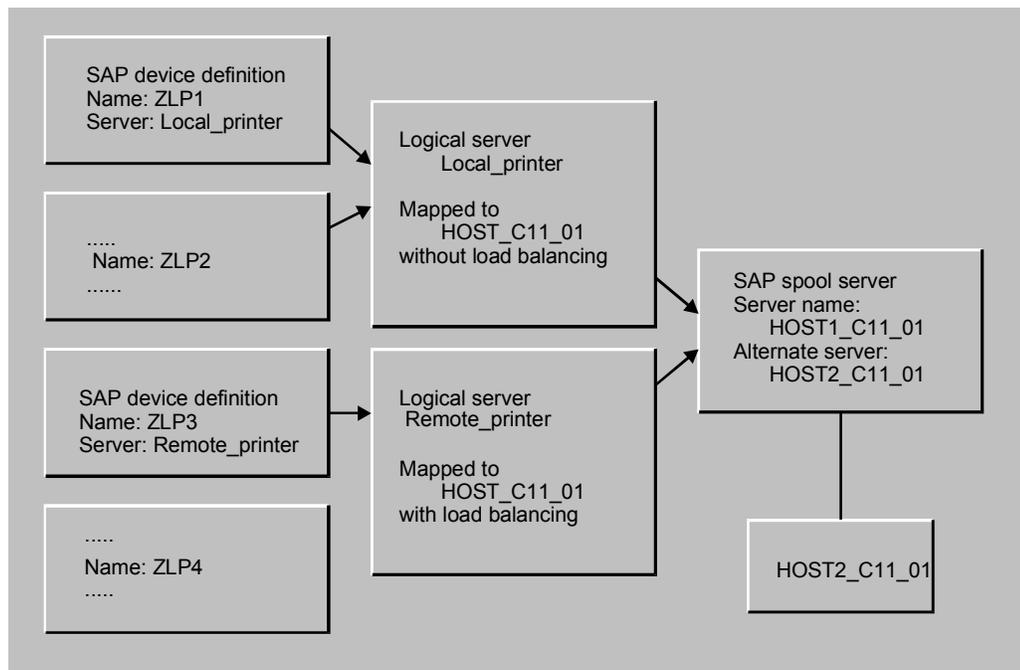
Logical Servers

A logical server is a hierarchy or one or more other logical and/or real SAP spool servers. Logical servers can be used in place of real SAP spool servers everywhere in the spool system. A device definition can, for example, specify a logical server as its spool server.

To resolve a logical spool server to a real SAP spool server, the spool system scans the hierarchies defined for the logical server. When a device definition specifies a logical server, the spool system looks through the server hierarchy to find a real server to process the output requests.

Using logical servers provides you with the following three possibilities for printer administration:

- Grouping devices (local and remote printers):** It allows you to organize SAP output devices into groups. For example, you can define logical servers for remote devices and local devices. Both logical servers could point to the same real SAP spool server. You can also manipulate devices separately, to assign them to a different spool server, for example.



- Switching servers:** If you assign output devices to a logical server, you can then switch the devices from one server to another quickly and easily. For example, if a spool server is down for maintenance, you can switch all of its devices to another server simply by changing the *Mapping* field in the logical server definition. When the original server is again available, you can switch the devices back to it just as easily.
- Defining a uniform, transportable printing landscape:** In contrast to real servers, logical servers can have the same names in multiple SAP Systems. Logical servers allow you to define a uniform SAP printing architecture and transport this architecture to all your systems.

This type of output architecture – device definitions and server definitions – can be transported in its entirety from one SAP System to another. After transport, all you have to do is specify the real spool servers found in the relevant systems.



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Alternate Servers

Alternate Servers

Definition

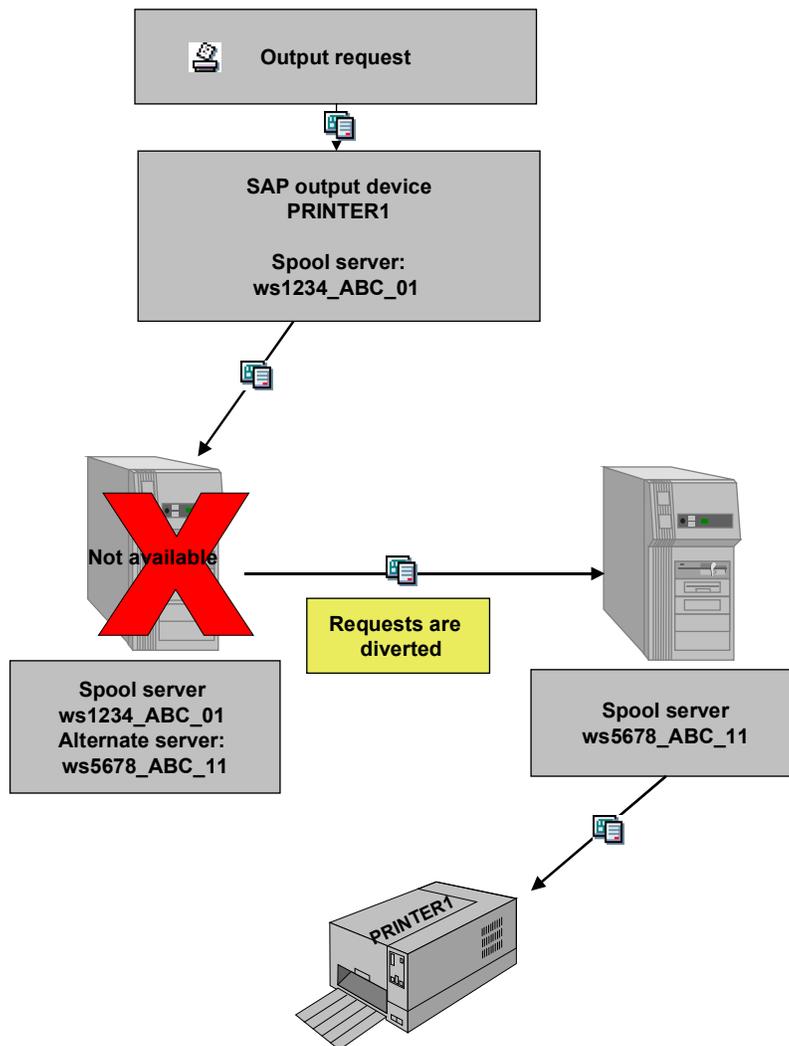
You can specify an alternate server when you define a spool server. This alternate server is used when the actual spool server is down or overloaded.

Use

When creating an SAP output device, enter a server that has a defined alternate server in the *Spool server* field. This ensures the requests for this output device will be processed.

Use of alternate server when spool server is unavailable

If you specified an alternate server when defining a spool server, the system will use this alternate server to process output requests when the actual spool server is unavailable.



Use of alternate server when spool server is overloaded

The load on a spool server is calculated using the number of spool work processes, the number of requests to be processed, and the number of pages. If a server is overloaded, processing of output requests may be delayed. If an alternate server is defined for this spool server, **and** load balancing is activated, the requests can be distributed among the servers.



If you activated load balancing for a server, there is no longer a guarantee that this server will process the requests in the order in which they were generated. Requests created later than others may be processed first, if they are processed by an alternate server that is not under high load.



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Alternate Servers

Interpreting the Spool Server Display

To display the relationship of real, logical, and alternative servers in your SAP System, choose *Tools* → *CCMS* → *Spool* → *Spool Administration* → *Spool servers* (*Devices / servers* tab page). Choose  *Complete hierarchy* to display the relationships of all spool servers.

Color Coding

The color coding in the spool server list has the following meaning:

- *Active server with spool work process*: This is a "real" spool server. It is active (that is, running), has at least one spool work process, and can process output requests.
- *Active server with assigned spool service*: This is an SAP spool server that is running. It does not, however, currently have any spool work processes. It does have an alternate spool server that is able to substitute for it. Output requests assigned to this server are therefore processed by an alternate server.
- *Logical server with assigned spool service*: This is a logical server (a name representing a hierarchy of one or more servers). In its logical server and/or alternate server hierarchies (the *Mapping* and *Alt. server* fields, respectively), there is a real spool server that can process its output requests. Output requests assigned to this server are therefore processed by another server.
- *Inactive server with assigned spool service*: This is a "real" SAP spool server that is currently down, but which has a substitute spool server in its *Alt. server* hierarchy. Output requests assigned to this server are therefore processed by an alternate server.
- *Server without assigned spool service*: This is a logical or real SAP spool server whose output requests cannot currently be processed. If it is a logical server, then there is no active server in its server hierarchies. If it is a real server, then neither the server nor any alternate server is available for processing output requests.
- *Server already represented*: This designation shows that a "wraparound" reference is being made to a real or logical spool server. The server is actually located higher in the same server hierarchy. The "wraparound" reference serves to close a loop in a server hierarchy, whereby a lower node refers back to a higher node. For example, the bottom node in a hierarchy might refer to the next higher node as its alternate server.

Display Functions

The spool server list shows relationships between servers as follows:

- "Mapping" relationships, those from a logical server to another logical or real server, are shown with horizontal lines. The spool system follows these lines when it resolves a logical server into a real server that it can use for processing output requests.
- Alternate server relationships, those from a real or logical server to a substitute or replacement server, are shown with vertical lines. The spool system follows these lines when it searches for an alternate server. This search can take place either when a server has become unavailable for processing output requests, or when load balancing is active.

You can display various views of the spool server hierarchy by putting the cursor on a particular server and choosing the following functions:

Interpreting the Spool Server Display

- *Complete hierarchy*: Use this function to display all server hierarchies that share any nodes (server references).

Shows the logical-server and alternate-server hierarchies that proceed from the server you mark. It also shows all other spool server hierarchies that share one or more nodes (server references) with the server you mark.

For example, assume that you have displayed the complete hierarchy for logical server LogServ1. It maps to real server host1_c11_01. If any other logical server or real server also references either of these servers -- host1_c11_01 or LogServ1 -- in its Mapping or Alternate server fields, then the Complete hierarchy display will also show you these hierarchies.
- *Mapping relationship*: Use this function to show only the logical-server and alternate-server hierarchies that proceed from the server that you mark. In effect, you look "down" the server hierarchies from the point of view of the server you mark.
- *Usage relationship*: Use this function to display all logical-server and alternate-server hierarchies that lead to the server that you mark. In effect, you look "up" the server hierarchies from the point of view of the server you mark.



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Assigning Output Devices to Another Server

If you want to change which servers output devices are assigned to all at once (because the server is down, for example), follow one of the procedures below:

Procedure

- The easiest way to do this is by creating logical servers between the output devices and the (real) spool servers when you configure your SAP spool system. Classify these logical servers after you create them (for example, which servers are for production printing, desktop printing, and so on). Each logical server refers to a real server that formats the output.

In the definition of your output devices, enter the name of one of these logical servers in the *Spool Server* field.

If you want to change server assignment (for example, for all production printers), you only have to change the definition of the corresponding logical server.

- If no logical servers are defined in your system, use a pattern (for example, `PR1*`) to specify for which output devices you want to change server assignment.
1. In transaction SPAD (Spool Administration), choose Utilities → For output devices → Assign server.
 2. On the next screen, enter a pattern for the specific output devices, as well as the name of the old spool server assigned and the name of the new spool server to assign the devices to.
 3. Choose Display list, then Convert to switch spool servers.

Result

You have changed the server assignment for some or all of your output devices. If output requests still exist for the affected devices, processing of the requests is transferred to the new spool server.



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Setting Parameters

Setting Parameters

This section provides summaries of profile parameters used by the spool system for access method L, local printing. See the profile parameter documentation, available online in transaction RZ11, for more information. Note that you need no longer set commands for access mode L in system profile parameters. Instead, you can define command sets in device definitions that use access method L.

You can configure the R/3 formatting programs with the system profile parameters shown in the list below. You may have to change default values in some UNIX systems in order to accommodate manufacturer-specific print commands. In other operating systems, no change from the default values of these parameters is necessary.

In Windows systems, the SAP spool system uses the Windows application interface for printing. You therefore do not need to set any spool parameter that specifies a print command or response format. No harm is done if the parameters are set, however.

The spool system itself is internally configured.

For more information, see the [Computing Center Management System \[Ext.\]](#) documentation.

- `rspo/host_spool/print`: The command which a printer program should use to have a host spool perform an output request.

Not required for Windows systems.

To have the formatting program pass spool request attributes to the host spool, you can enter the following variables in the command text:

&P	The host-system name of the output device
&F	The name of the file to be printed. The name is supplied in the <code>rspo/to_host/data_file</code> parameter, described below.
&C	The number of copies to print.
&& :	A single '&'
&I :	Job name of the SAP spool
&J :	Job name of the SAP spool, with database name
&L:	Format (layout)
&M :	Client of the owner
&O :	Owner
&m :	Client of the user printing
&o :	User printing
&t :	Telephone number (FAX)
&T :	Title
&R :	Recipient (cover sheet)

Setting Parameters

&D :	Department (cover sheet)
&S :	R/3 name of the output device
&Y :	Priority
&U :	UNIX cover sheet required? ('N'=no, 'X'=yes, 'D'=default)
&N	Spool request number
&n	Output request number

To pass this information to a shell script or UNIX command, replace the profile value of `rspo/host_spool/print`, with a statement similar to:

```
/usr/local/bin/print &P &F &C &L &R &D
```

The value of `rspo/host_spool/print` is usually set to:

```
/usr/bin/lpr -P&P -J&F -h -#&C &F 2>&&1; /bin/rm &F
```

To determine the print command for your host system, consult the system documentation. Some sample commands include the following:

Host system	Print command
HP-UX	<code>/usr/bin/lp -d&P -n&C -onb -or &F; rm &F</code>
AIX	<code>qprt -dp -P&P -Bnn -N&C -r -R14 -X850 &F</code>
OSF/1	<code>/usr/ucb/lpr -P&P -J&F -h -#&C &F 2>&&1;/bin/rm &F</code>
SINIX and Spool 4.x	<code>/var/spool/Spool/config/cmd/xpadd -job -dr &F -de &P -fc &C -rw -rm</code>
Other UNIX	<code>/usr/bin/lp -d&P -n&C -c &F; rm &F</code>
Solaris (see SAP Note 16149)	saplp &P &C &F where saplp is a shell script containing the following lines: <code>/usr/bin/lp -d"\$1" -n"\$2" -onb -or -c "\$3"</code> <code>/bin/rm "\$3"</code>
Windows NT	<code>print /d:&P &F</code> (default command), where &P is a printer port in the Windows NT System.

- `rspo/host_spool/query`: The command to use to request the status of a print job from the host spool.

Not required for Windows systems.

You can enter the variables shown above in the description of the `rspo/host_spool/print` parameter in the command text.

A sample command is shown below:

Host System	Query Command
SINIX with Spool 4.x	<code>/var/spool/Spool/config/cmd/xpstat</code>
OSF/1	<code>/usr/ucb/lpq -P&P</code> You should also set <code>rspo/host_spool/print_answer_ignore1</code> to "Job Number is" to allow the spool system to recognize the query answer.
HP-UX, other UNIX	<code>/usr/bin/lpstat -o&P</code>

Setting Parameters

- `rspo/to_host/data-file`: The name for the files passed by the formatting process to the host spool.

The name that you select must meet the following requirements:

- It must contain a string of eight + characters.

The formatting program replaces these characters to create a unique file name.

- It must not exceed any length limitations imposed by the host spool.

In normal operation, these files are deleted almost immediately. Should you want to check the contents of these files, change the print command in `rspo/host_spool/print` so that the files are not deleted.

- `rspo/rspoget2_daemon/tcp_block_size`: The block size for TCP/IP communications between the formatting program and the transfer program.

Default: 1K blocks. In some network environments, larger block sizes, such as 8K, cause communications problems.

- `rsts/ccc/cachesize`: The size of the shared-memory area that is created for translation tables for character codes.

Default: 60K. If it overflows, the buffer is automatically reorganized. The buffer is also reorganized if any character set is invalidated. Creation and reorganization of the buffer result in system log messages with the reference "Buffer RSTSCCC".

You should enlarge the buffer if automatic reorganizations occur repeatedly. Before enlarging the buffer, you must invalidate all entries as described under "Activating a Character Set" in [Defining a Character Set \[Page 302\]](#).



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Location for Storing Spool Data

Use the following parameter to specify where the spool system is to store its data:

- `rspo/store_location`: Specifies whether the spool system is to store data in the SAP System's database or in files in the host system.

Possible values:

- **db**: spool requests are stored in the database in table TST03.

Advantage: spool files are protected by the backup and recovery mechanisms of the database system.

- **G**: spool requests are stored in the standard R/3 "global" directory: `/usr/sap/C11/SYS/global/` (UNIX systems).

Advantages: faster access to spool data; more flexibility. Disadvantage: files are not protected by database backup and recovery mechanisms.

Specifying a path name other than the predefined path is not recommended. Should this be absolutely necessary, you can alter the path name in the file `rsts/files/root/G`. You should not change the file naming convention specified in the file.

Also ensure that the directory is accessible to all instances in your SAP System and that the directory is the same for all instances.

Enter the **db** and **G** values exactly as shown; the capitalization is important.

The reports that check spool/TemSe consistency (RSPO0041) and which reorganize the spool and TemSe (delete old spool requests, RSPO0043) are able to handle both database and file system storage.

In principle, the TemSe storage method can vary among the application servers of an SAP System. In practice, SAP recommends, however, that the entire SAP System uses a single storage method for TemSe objects.

The following table summarizes the advantages and disadvantages of each type of storage:

File or Database Storage for TemSe Objects?

Type of Storage	Advantages	Disadvantages
File system	Relatively fast: improved performance.	TemSe data must be backed up and restored using operating system tools, separately from the database. In the event of problems, it can be hard to restore consistency between the data held in files and the TemSe's object management in the database.
Database	Back-up and restore with database tools. Consistency is ensured.	Slower than file system storage. Increased database load.

Location for Storing Spool Data

Disk storage requirements: In some cases, spool data may occupy several hundred megabytes of disk storage. If you use the **G** option, you must ensure that enough free disk space is available for spool data.

Naming convention: the naming convention used for spool files, as well as all other TemSe objects (background processing job logs, at this time), is as follows:

Files are stored by type and client of origin in a subdirectory with the name <client><first five characters of object name>. The object name is specified in table TST07.

Examples: 001SPOOL (spool requests directory, client 1), 001BCTLG (background processing job logs, client 1).

Within these directories, the data belonging to a TemSe object is held as a individual file. Spool data, for example, is held in files that are named with the ID numbers of the spool requests.



You can also [set the storage location individually for each output device \[Page 329\]](#).



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Setting a Storage Location for Output Devices

Use

You can specify whether spool data is stored in the database or in the file system, for each output device.

Procedure

1. Call *Spool Administration* (*Tools* → *CCMS* → *Spool* → *Spool Administration*). Enter the name of the output device on the *Devices / servers* tab page and confirm your entry.
2. Choose *Edit* → *Data storage*. Then choose from the following:

Matching profile	Use the storage mode specified in the system profile of the <i>Spool server</i> . This is the default setting.
Database	Spool request data for this device is stored in the R/3 database. This is the safest but also the slowest way to manage spool request data.
File system (global)	Spool request data for this device is stored in the globally shared R/3 file system. This is faster than database storage, but carries the risk of loss of spool request data in the event of database or other system problems.
File system (local)	Spool request data for this device is stored in a local file on the <i>Spool server</i> host. This is the fastest storage mode, but carries the risk of loss of spool request data in the event of database or other system problems.



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Customer Enhancement for Spool Accounting

Customer Enhancement for Spool Accounting

Use

For accounting purposes, the spool system collects detailed use statistics. The spool system does not provide an accounting tool, but makes the data available through the spool accounting user exit. You can access the exit using the enhancement *SPOOACC*.

Features

The exit is designed to analyze and store the accounting information, before all the information is deleted.

The exit is called when the report RSPO1041 is run to delete spool requests. An internal table of type TSPJSTAT is transferred. This table contains the information about all print requests to be deleted.

Only those records not processed elsewhere are transferred (see documentation for TSPJSTAT).

Activities

To activate spool accounting, use the following profile parameters:

- **rspo/stat/jobs**: An entry is written to the table TSPJSTAT for each output request.
- **rspo/stat/query**: Every time a printer is queried, data about the queue is written to table TSPQSTAT.



For an example of the analysis of spool data statistics, see report RSPOSTAT.



For general information about R/3 function exits, see [The R/3 Enhancement Concept \[Ext.\]](#) and transaction **CMOD**.



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Customer Enhancement for Spool Authorization Check

Use

You can add your own authorization checks to those already implemented in the authorization object [S_SPO_ACT \[Page 216\]](#) (*Spool: Actions*). An exit is provided for this purpose through the enhancement *SPOOAUTH*. Once the enhancement is activated, the function module EXIT_SAPLSPOR_001 is used for the check.

Features

When this function module is called, the general authorizations SP01 and SP0R are checked centrally. You can use this function to tailor additional checks (for example, the check of the authorization field of a spool request) to your own needs

The parameters that are passed are the type of access (ACCESS) and the header information for a spool request (SPOOLREQ)

Activities

This enhancement mechanism is only used if the spool authorization check is set for the new procedure using the CUSTOM option. To do this, set the parameter **AUTHORITY** to the value **CUSTOM** in the TSOPTIONS table.



For general information about R/3 function exits, see [The R/3 Enhancement Concept \[Ext.\]](#) and transaction **CMOD**.



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