PrintEx

IBM z/OS Mainframe
Print Services
Extender

Version 6

PrintEx - IBM z/OS Mainframe Print Services Extender

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Introduction

PrintEx - which can shortly be described as a 'host-based printer driver' - is a software system from XPS used to extend the printing capabilities on IBM mainframes.

PrintEx is based on XPSDaemon, a mainframe server application from XPS. XPSDeamon serves as a basis for a number of software products from XPS. In particular, PrintEx makes use of the XPSDaemon functionality for internal mainframe communication as well as for the communication with soft- and hardware components in networks reachable via TCP/IP and SNA.

In addition, XPSDaemon enables authorized administrators to configure the various PrintEx options online in a comfortable manner. Alternatively administration can be carried out using the PrintEx batch processor which is also part of the PrintEx software package.

From the administrator's point of view XPSDaemon and PrintEx are to be seen as a single and uniform program package. Throughout this document 'XPSDaemon' and 'PrintEx' are interchangeable.

Concept

The following illustration shows the basic PrintEx concepts:

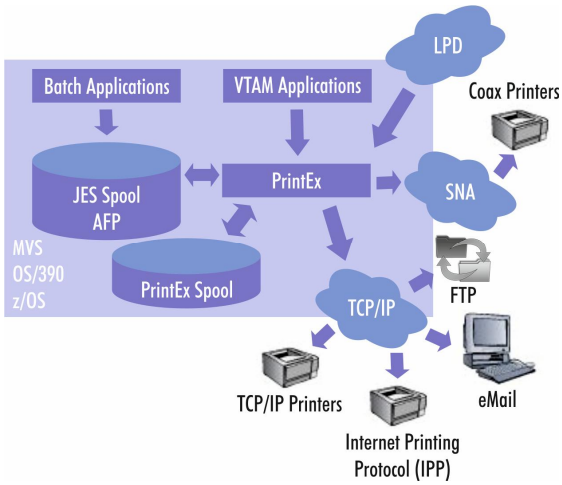


Fig. 1: PrintEx concept

As can be seen in the illustration, PrintEx posseses input channels as well as output channels thus serving as a connector being able to coordinate and distribute print output on a mainframe.

Part of the PrintEx package is a hierarchical file system – called the PrintEx spool – which on the one hand is used as temporary storage during the processing of print output data and on the other hand can be used as a long-term backup medium for print output data.

Input channels and output channels

PrintEx is capable of processing print output generated from VTAM applications such as CICS or IMS and print output stored in JES or the PrintEx spool, respectively.

In addition PrintEx can be used as a LPD daemon in order to process print data to be transmitted using the LPD/LPR protocol over TCP/IP.

Available output channels are JES, the PrintEx spool, native SNA printers, TCP/IP printers and printers supporting the Internet Printing Protocol (IPP).

Transmission of the print output data as PDF or TXT attachment via e-mail is also supported. Last but not least, PrintEx is able to transfer print output data over FTP.

Printer specific extensions

PrintEx makes it possible for the administrator to adjust the generated print data to printer specific requirements. To achieve this goal, so-called 'printer models' can be defined which may include printer specific prefix and suffix data to be inserted into the printer data stream automatically.

Furthermore the facility to exchange predefined sequences of characters in the print data stream with printer specific replacements is provided. Thus the print data can be formatted targeting specific printer hardware through inserting printer specific PCL or PostScript commands without any programming. In doing so it is quite easy to, e. g., choose the printer tray, the page orientation or duplex printing.

AFP data can be converted to PostScript or PDF by PrintEx. This makes it possible to print AFP data directly on network printers or to transmit AFP data as a PDF attachment via e-mail.

Chapter

2

Overview

The goal of this chapter is to give an overview of the PrintEx functionality to the administrator and to show the correlations between the various resource definitions. The following table defines some important terms used in this document.

Term	Meaning
VTAM printer	This is a VTAM resource definition. Mainframe applications such as CICS can establish a connection with a VTAM printer and then use this as a target for print output.
JES printer	This is a logical PrintEx printer. Each JES printer can be linked to a number of JES spool file options such as output class, destination or writer name.
Destination	This is the description of an output medium being capable of processing print data. TCP/IP printers, the JES spool, SNA printers, e-mail and the PrintEx spool are, among others, possible destinations.
Model	This is a collection of definitions describing the processing of print output data. For example, a model is used to define the code page to be used for character translation and to define the maximum number of lines to be printed on one page.
PrintEx spool	This is a hierarchical file system based on VSAM RRDS developed and owned by XPS. PrintEx uses this internal spool file to store temporary information such as print data or conversion results. Furthermore the PrintEx spool can be used for the archiving of print data if required.
SAPI	This is the JES spool API. PrintEx makes use of SAPI in order to access those JES spool files which meet the JES spool file options of any defined PrintEx JES printer.
Converter	These are PrintEx subroutines used to convert print output data into a format required by a chosen destination. If, for example, e-mail is chosen as destination, a special converter will be called to create a PDF document from the print output data which afterwards will be attached to the e-mail to be sent.

PrintEx is able to process print output data from two different sources. Print output data from VTAM printers as well as print data stored in the JES spool can be processed.

PrintEx supports the following destinations: TCP/IP printers, SNA printers, the JES spool, PDF attachments via e-mail, FTP and the PrintEx spool (for archiving).

In the context of the source definitions (VTAM printers/JES spool) the attachment of up to 10 different destinations to each source is supported. This makes it possible, for example, to print data to one or more physical printers, to send the data as e-mail attachment and to archive the data in the PrintEx spool in a single thread of processing.

Definition and administration of the various destinations are the main tasks for the PrintEx administrator.

For each destination, two different definitions are required.

In the first step the output target needs to be defined. If, for example, a TCP/IP printer is to be the output target, the printer's TCP/IP address and port will have to be made known.

In the second step at least one model has to be attached to the destination. PrintEx allows up to six different models to be attached to one destination.

This makes it possible to choose a different model depending on the maximum number of characters in each line in the printed document in order to optimize the use of the available page size based on the maximum line length.

The following illustration shows the dependencies between the various PrintEx resource definitions:

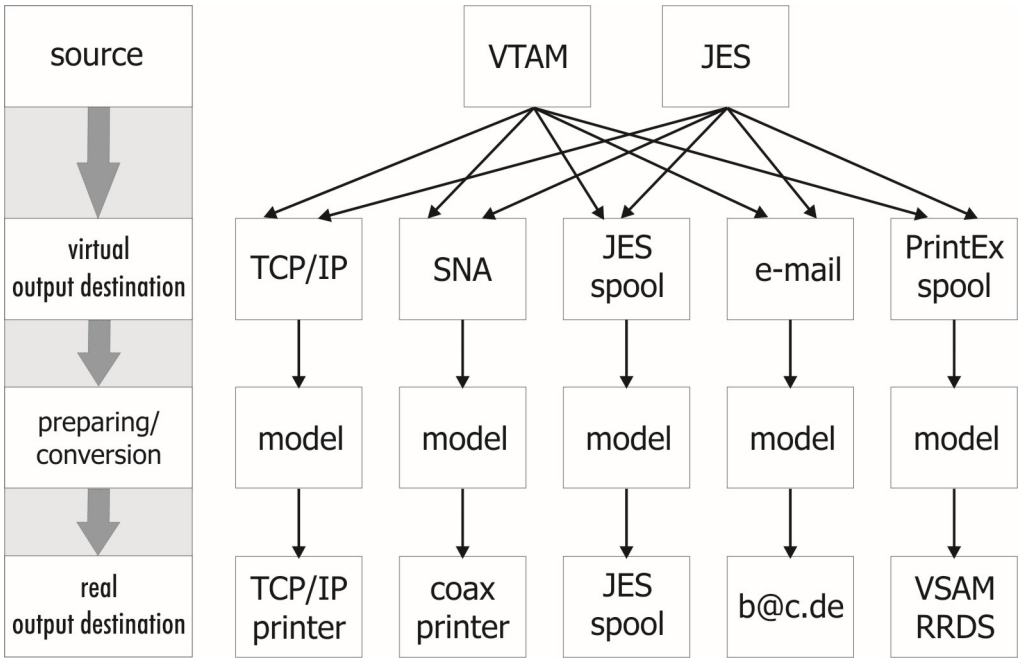


Fig. 2: Function overview

Chapter

3

Installation

System requirements

Operating system requirements

PrintEx can be executed under OS/390 Version 1.3 or under z/OS Version 1.1. Additionally TCP/IP for MVS Version 3.1 or Communications Server for OS/390 Version 2.4 is required. All newer versions than the ones mentioned are also supported.

Hardware requirements

PrintEx does not require special hardware. Any hardware capable of running the previously mentioned operating system requirements will be sufficient.

The PrintEx installation will allocate approximately 400 MB of hard disk space for the various libraries. In order to transfer the installation files to the mainframe a CD drive and a FTP connection to the mainframe must be available.

Installation steps

The installation consists of the following steps which will be explained later on:

- Transferring the installation files to the mainframe
- Adjusting the installation variables
- Installing the AFP converter under USS - optional
- Adjusting the VTAM system environment
- Defining PrintEx to RACF
- Granting APF authorization

Transferring the installation files to the mainframe

All the installation libraries found on the installation CD are to be transferred to the mainframe on which PrintEx is to be installed using a FTP client program.

The libraries as well as the backup of the help file are available as TSO transmit format files (XMIT) on the CD and must be transferred in binary mode.

The allocation of the required files on the target mainframe is necessary before the installation files are transferred to the host. The following values should be used to allocate the target files:

Name	Space	Lrecl	Blksz	Recfm
XMIT.XPSDAEM.V600.LOADLIB	600,(100)	80	3200	FB
XMIT.XPSDAEM.V600.MACLIB	200,(20)	80	3200	FB
XMIT.XPSDAEM.V600.DATA	200,(20)	80	3200	FB
XMIT.XPSDAEM.V600.FILEBKUP	200,(20)	80	3200	FB
XMIT.XPSDAEM.V600.HELPBKUP	600,(100)	80	3200	FB

Then the files located in the subdirectory '\MVS' on the CD can be transferred to the host files as shown in the following table:

Client name	Host name
XPSD600L.BIN	XMIT.XPSDAEM.V600.LOADLIB
XPSD600M.BIN	XMIT.XPSDAEM.V600.MACLIB
XPSD600D.BIN	XMIT.XPSDAEM.V600.DATA
XPSD600F.BIN	XMIT.XPSDAEM.V600.FILEBKUP
XPSD600H.BIN	XMIT.XPSDAEM.V600.HELPBKUP

Afterwards the TSO transfer files must be received using the following TSO commands:

Loadlib:

```
RECEIVE INDSN(XMIT.XPSDAEM.V600.LOADLIB)
```

After input of the 'RECEIVE' command the following prompt will appear:

```
INMR901I Dataset XPSDAEM.V600.LOADLIB from XPSSYST on NODENAME
INMR906A Enter restore parameters or 'DELETE' or 'END' +
```

The desired library name as well as the volume must be indicated as follows:

```
DSN(xpsdaem.V600.loadlib) VOL(mvs001)
```

The XPSDaemon loadlib must be granted APF authorization because the SAPI macro (JES2/JES3 Spool SYSOUT API) 'IEFSSREQ' can be used only by privileged applications.

Maclib:

```
RECEIVE INDSN(XMIT.XPSDAEM.V600.MACLIB)
```

After input of the 'RECEIVE' command the following prompt will appear:

```
INMR901I Dataset XPSDAEM.V600.MACLIB from XPSSYST on NODENAME
INMR906A Enter restore parameters or 'DELETE' or 'END' +
```

The desired library name as well as the volume must be indicated as follows:

```
DSN(xpsdaem.V600.maclib) VOL(mvs001)
```

Data:

```
RECEIVE INDSN(XMIT.XPSDAEM.V600.DATA)
```

After input of the 'RECEIVE' command the following prompt will appear:

```
INMR901I Dataset XPSDAEM.V600.DATA from XPSSYST on NODENAME
INMR906A Enter restore parameters or 'DELETE' or 'END' +
```

The desired library name as well as the volume must be indicated as follows:

```
DSN(xpsdaem.V600.data) VOL(mvs001)
```

Filebackup:

```
RECEIVE INDSN(XMIT.XPSDAEM.V600.FILEBKUP)
```

After input of the 'RECEIVE' command the following prompt will appear:

```
INMR901I Dataset XPSDAEM.V600.FILEBKUP from XPSSYST on NODENAME
INMR906A Enter restore parameters or 'DELETE' or 'END' +
```

The desired library name as well as the volume must be indicated as follows:

```
DSN(xpsdaem.V600.filebkup) VOL(mvs001)
```

Help file

```
RECEIVE INDSN(XMIT.XPSDAEM.V600.HELPBKUP)
```

After input of the 'RECEIVE' command the following prompt will appear:

```
INMR901I Dataset XPSDAEM.V600.HELPBKUP from XPSSYST on NODENAME
INMR906A Enter restore parameters or 'DELETE' or 'END' +
```

The desired library name as well as the volume must be indicated as follows:

```
DSN(xpsdaem.V600.helpbkup) VOL(mvs001)
```

Adjusting the installation variables

The following job control is used to configure PrintEx. A configuration job pattern named 'INSTALL' can be found in the XPSDaemon macro library 'XPSDAEM.V600.MACLIB'.

Excerpt from the 'INSTALL' job:

```
//XPSVINST    JOB ,'INSTALL',CLASS=A,MSGCLASS=X
//*
//*       XPSDAEM.MACLIB(INSTALL)
//*
//*       THIS JOB WILL ALLOCATE THE REQUIRED XPS DATA SETS.
//*
//*       MODIFY THE SUBSTITUTION PARMS TO MEET YOUR
//*       SITE'S REQUIREMENTS BEFORE SUBMITTING.
//*
//*
//INSTALL PROC LANG=D,                       <== DIALOG/MESSAGE LANGUAGE
//        LOADLIB='XPSDAEM.V600.LOADLIB',    <== XPS PDS-MACLIB-DSN
//        MACLIB='XPSDAEM.V600.MACLIB',      <== XPS PDS-MACLIB-DSN
//        VDSN='XPSDAEM.V600.FILE',          <== XPSVFIL-DSN
//        VVOL='(MVS001,1000)',              <== XPSVFIL-VOLUME/RECORDS
//        SDSN='XPSDAEM.V600.SPOOL',         <== XPSPOOL-DSN    .
//        SVOL='(MVS001,5000)',              <== XPSPOOL-VOLUME/RECORDS .
//        DDSN='XPSDAEM.V600.DUMP',          <== XPSVDMP-DSN
//        DVOL='(MVS001,500)',               <== XPSVDMP-VOLUME/RECORDS
//        TDSN='XPSDAEM.V600.TRACE',         <== XPSVTRA-DSN
//        TVOL='(MVS001,500)',               <== XPSVTRA-VOLUME/RECORDS
//        CDSN='XPSDAEM.V600.HELP',          <== XPSHELP-DSN
//        CVOL='(MVS001,3500)',              <== XPSHELP-VOLUME/RECORDS
//        BKUP='XPSDAEM.V600.FILEBKUP,       <== XPS XPSVFIL BACKUP
//*                                          <== XPSDAEM-HELP BACKUP-FILE
//        HBKUP='UNIT=3390,VOL=SER=MVS001,DSN=XPSDAEM.V600.HELPBKUP'
//*
```

Fig. 3: Configuration job MVS

Parameter	Description
LANG	This character specifies the language to be used by PrintEx to display messages and text strings on online dialogues. PrintEx currently supports English, 'E', and German, 'D'.
MACLIB	Name of the macro library containing the installation and example members.
LOADLIB	Name of the library containing the executable programs.
VDSN	Dataset name of the PrintEx system file.
VVOL	Name of the disc about to hold the file 'VDSN' and the number of records for the file 'VDSN'. Default: (MVS001,1000)
SDSN	Dataset name of the PrintEx spool file.
SVOL	Volser of the disk containing 'SDSN' and the number of records for the file 'SDSN'. Default: (MVS001,5000)
DDSN	Dataset name of the PrintEx dump file.
DVOL	Volser of the disk containing 'DDSN' and the number of records for the file 'DDSN'. Default: (MVS001,500)
TDSN	Dataset name of the PrintEx trace file.

TVOL Volser of the disk containing 'TDSN' and the number of records for the file 'TDSN'.

Default: (MVS001,500)

CDSN Dataset name of the PrintEx online help file.

CVOL Volser of the disk containing 'CDSN' and the number of records for the file 'CDSN'.

Default: (MVS001,2000)

BKUP JCL statement for the PrintEx backup file containing some pre-adjustments. These will be loaded during the installation process.

HBKUP JCL-REPRO specifications of the source file for the IDCAMS repro of the online help file.

```
UNIT=dasd,VOL=SER=mvs001,DSN=XPSDAEM.V600.HELPBKUP
```

The device type 'dasd', the disk name 'mvs001' and the dataset name of the transmitted online help source file should be modified to meet the installation environment.

Installing the AFP converter under USS - optional

If the conversion of AFP print data to PDF or PostScript will be required, addional steps must be executed during installation.

The conversion of the AFP print data is carried out using a service program which will be executed under z/OS USS (z/OS UNIX System Services).

The library containing the AFP converter is available as a TSO transmit format file (XMIT) on the CD and must be transferred in binary mode.

The allocation of the required file on the target mainframe is necessary before the installation file is transferred to the host. The following values should be used to allocate the target file:

Name	Space	Lrecl	Blksz	Recfm
XMIT.XPSDAEM.V600.AFP2ANY	200,(20)	80	3200	FB

The file located in the subdirectory '\MVS' on the CD then can be transferred to the host file as shown in the following table:

Clientname	Hostname
XPSD600A.BIN	XMIT.XPSDAEM.V600.AFP2ANY

Afterwards the TSO transfer files must be received using the following TSO commands:

BIN:

```
RECEIVE INDSN(XMIT.XPSDAEM.V600.BIN)
```

After input of the 'RECEIVE' command the following prompt will appear:

```
INMR901I Dataset XPSDAEM.V600.AFP2ANY from XPSSYST on NODENAME
```

```
INMR906A Enter restore parameters or 'DELETE' or 'END' +
```

The desired library name as well as the volume must be specified as follows:

```
DSN(xpsdaem.V600.afp2any) VOL(mvs001)
```

In a final step the received file must be transferred to USS, uncompressed and granted APF authority.

All of these steps can be executed by running a job named 'JHAVI' which is located in 'XPSDAEM.V600.MACLIB'.

XPSDAEM.V600.MACLIB(JHAVI):

```
//COPYFS   JOB <job parameters>
//COPYFS1 EXEC PGM=IKJEFT01,DYNAMNBR=300,COND=EVEN
//SYSTSPRT DD SYSOUT=*
//HFSIN    DD DISP=SHR,DSN=XPSDAEM.V600.AFP2ANY(HAVITAR)
//HFSOUT   DD PATH='/xps/printex/havi.tar.z',
//            PATHDISP=(KEEP,DELETE),
//            PATHOPTS=(OWRONLY,OCREAT),
//            PATHMODE=(SIRWXU,SIRWXG,SIROTH,SIXOTH)
//STDOUT   DD SYSOUT=*,DCB=(RECFM=VB,LRECL=133,BLKSIZE=137)
//STDERR   DD SYSOUT=*,DCB=(RECFM=VB,LRECL=133,BLKSIZE=137)
//SYSPRINT DD SYSOUT=*
//SYSTSIN  DD DATA,DLM='/>'
OCOPY INDD(HFSIN) OUTDD(HFSOUT) BIN PATHOPTS(USE)
BPXBATCH SH cd /xps/printex ; +
            tar -xvof /xps/printex/havi.tar.z ; +
            extattr +a afp2any
/>
```

Fig. 4: Install job for AFP-conversion under USS

Parameter	Beschreibung
HFSIN	This is the input dataset. The previously received library contains only one member named 'HAVAITAR'. This member containes the compressed program archive for the AFP converter.
HFSOUT	This is the output dataset. The chosen target directory ('/xps/printex' in the example) must be mounted in the underlying file system and must be granted sufficient authority. This is required because the AFP converter must be granted APF-authority.

Adjusting the VTAM system environment

PrintEx online administration is carried out using the VTAM application 'XPSDaemon'.

This requires the definition of XPSDaemon in the ACT/VTAM network. An example for the needed resource definition named 'VTAMLST' will be copied to the PrintEx MACLIB during installation.

The following application must be defined in the ACF/VTAM network:

```
XPSDAEM  APPL  AUTH=(PASS,ACQ,SPO),PARSESS=YES,APPC=YES,       X
                 VPACING=1
```

Fig. 5: XPSDaemon application entry

Defining PrintEx to RACF

In order to allow PrintEx access to the JES spool files, the following RACF definitions must be made:

```
RDEF JESSPOOL jesnode.* UACC(NONE)
```
← may be already defined

```
PE jesnode.* CL(JESSPOOL) ID(printex-username) ACC(UPDATE)

SETROPTS GENERIC(JESSPOOL) REFRESH
```

Granting APF authorization

The XPSDaemon loadlib must be granted APF authorization, because PrintEx depends on the SAPI macro (JES2/JES3 Spool SYSOUT API) 'IEFSSREQ' which may be used only by privileged applications.

PrintEx management

PrintEx startup

The following job stream can be used to start XPSDaemon/PrintEx. A sample member for the startup named 'XPSSTART' can be found in the PrintEx MACLIB.

Example job:

```
//XPSD600  JOB ,'PRINTEX START',CLASS=A,MSGCLASS=c
//XPSD600  EXEC PGM=XPSDAEM,REGION=64M,TIME=1440,PERFORM=99,          X
// PARM='APPL=XPSD600,AUTH=YES,PREX=YES'
//STEPLIB  DD DISP=SHR,DSN=XPSDAEM.V600.LOADLIB
//XPSVFIL  DD DISP=SHR,DSN=XPSDAEM.V600.VFIL
//XPSPOOL  DD DISP=SHR,DSN=XPSDAEM.V600.SPOOL
//XPSVTRA  DD DISP=SHR,DSN=XPSDAEM.V600.TRACE
//XPSVDMP  DD DISP=SHR,DSN=XPSDAEM.V600.DUMP
//XPSDATA  DD DISP=SHR,DSN=XPSDAEM.V600.DATA
//XPSHELP  DD DISP=SHR,DSN=XPSDAEM.V600.HELP
//SYSUDUMP DD SYSOUT=(c,XPSDUMP)
//SYSOUT   DD SYSOUT=(c,XPSOUT)
//SNAPDMP  DD SYSOUT=(c,XPSSNAP)
//LOG      DD SYSOUT=(c,XPSLOG)
//PRTAPPL  DD DUMMY
//SYSTCPD  DD DISP=SHR,DSN=TCPIP.DATA
```

Fig. 6: Startup job MVS

Parameter	Description
APPL	This is the name of the XPSDaemon application used to define XPDaemon in the ACF/VTAM environment.
AUTH	'AUTH=YES' indicates, that XPSDaemon is loaded from an APF authorized library. This option must be set for PrintEx.
TCPN	This is the name of the TCP/IP job to be used by PrintEx for TCP/IP communication.

WLMG	Sysplex group name to be used for the registration in the MVS workload manager (WLM) if desired. The group name must not be longer than 18 characters.
RDON	If 'RDON=YES' is specified, the PrintEx system file 'XPSVFIL' will be opened in read only mode thus enabling more than one XPSDaemon region to access the file simultaneously.
PREX	'PREX=YES' informs XPSDaemon that the PrintEx sub-component is to be made available. This option must be set.
LPDP	The TCP/IP port to be observed by the the PrintEx LPD listener. While running, LPD/LPR data can be sent to PrintEx using this port.

If PrintEx is to be used to process AFP data, a DD-Statement for the dataset 'SYS1.SAPKMOD1' has to be added to the job's STEPLIB.

In this case it is also necessary to grant APF authorization to the 'SYS1.SAPKMOD1' dataset.

Logon to PrintEx

In order to log on to the PrintEx online environment the following VTAM logon command has to be executed:

```
LOGON APPLID(XPSDAEM)
```

The application name 'XPSDAEM' has to be replaced with the VTAM ACB-name previously used to define XPSDaemon in the ACT/VTAM environment.

Termination of PrintEx

In order to terminate PrintEx, XPSDaemon has to be terminated.

This can be carried out using the function 'Shutdown XPSDaemon' from the PrintEx online menu.

The shutdown will be logged to the system console. The shutdown log record will include the name of the user initiating the shutdown as well as the user's terminal name.

XPSDaemon can also be shutdown using operator commands on the system running XPSDaemon.

The following two operator commands can be used to shutdown XPSDaemon:

```
F jobname,SHUT
```

```
P jobname
```

Parameter	Description
jobname	This is the name oft he XPSDaemon job or started task.

The log dataset

The PrintEx startup job must include a DD-statement for an internal log dataset. This will contain all the PrintEx protocol messages.

In case of a program exception a snapshot of the internal PrintEx trace will be printed to the log dataset if the internal trace has been activated.

MVS supports dynamic log dataset creation. This makes it possible to print out a log dataset without terminating XPSDaemon/PrintEx.

The Modify command to create a new log dataset must be executed using the system console of the system running XPSDaemon/PrintEx and has the following format ('[]' indicates optional input not necessarily required):

```
F jobname,SPIN[,CLASS=x]
```

Parameter	Description
jobname	This is the name oft he XPSDaemon job or started task.
SPIN	'SPIN' instructs XPSDaemon to close and deallocate the currently active log dataset and to allocate and open a new one. The closed log dataset will be available for further processing.
CLASS=x	The parameter 'CLASS=' is optional. It can be used to specify the 'SYSOUT' class for the newly allocated log dataset. Valid values are the ranges from 'A' - 'Z' and '0' - '9'. If this parameter is not specified the newly allocated log dataset will have the same class as the log dataset previously closed.

Chapter

4

Online administration

Logon

The PrintEx online administration requires the administrator to be logged on to PrintEx. The user name and the password can be specified in the screen mask shown below:

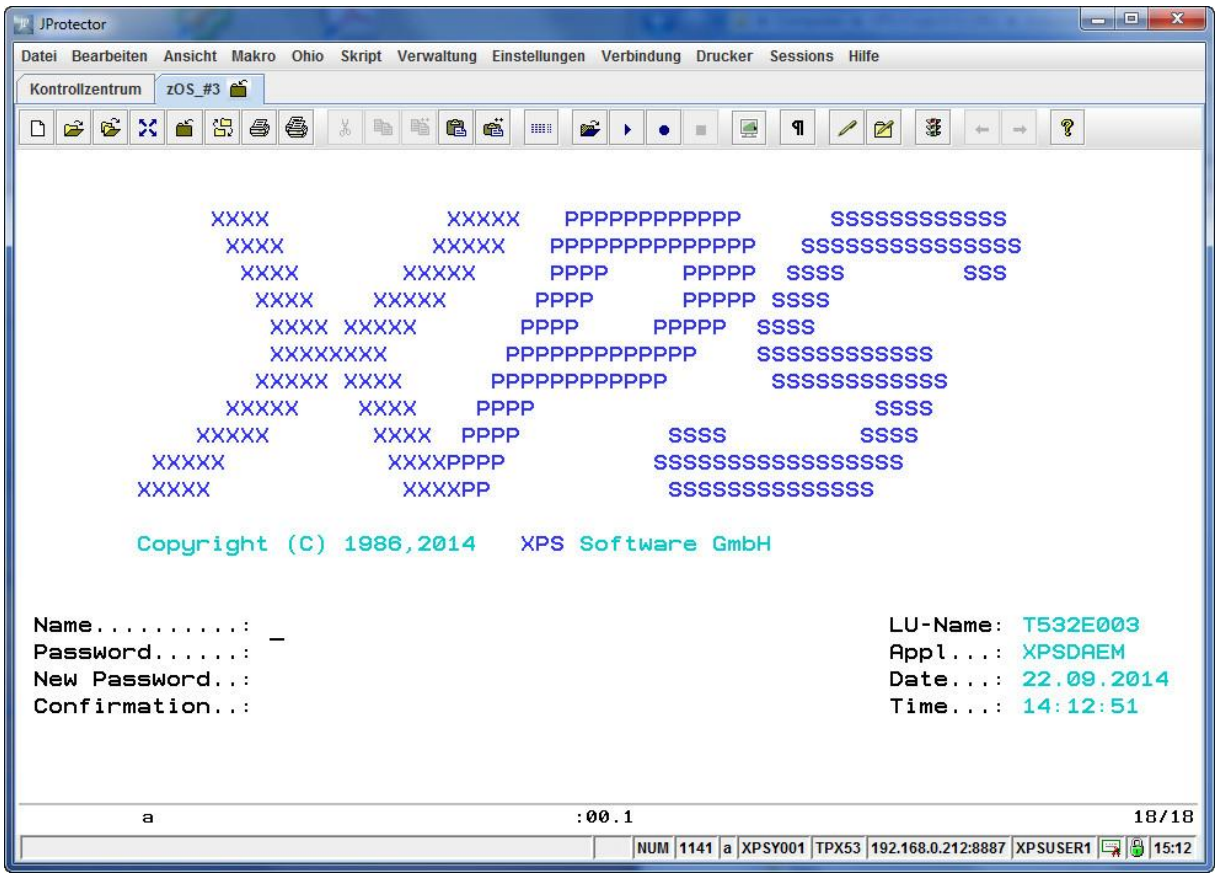


Fig. 7 PrintEx logon screen

During installation a default user entry named 'XPSMAST' is defined. The initial password for the default user is 'XPS'. This user entry must be used for the first log on.

'XPSMAST' has the profile 'ADMIN' attached to it. 'ADMIN' has all available security levels activated. XPS suggests deleting the 'XPSMAST' user entry after the needed PrintEx administrators have been defined and been granted the required security levels.

Administration

The transaction used to administer PrintEx can be started using the transaction code 'PREX'. This has to be input into the PrintEx USSTAB shown in response to a successful log on.

The menu displayed below can be used to choose the various PrintEx functions for administration.

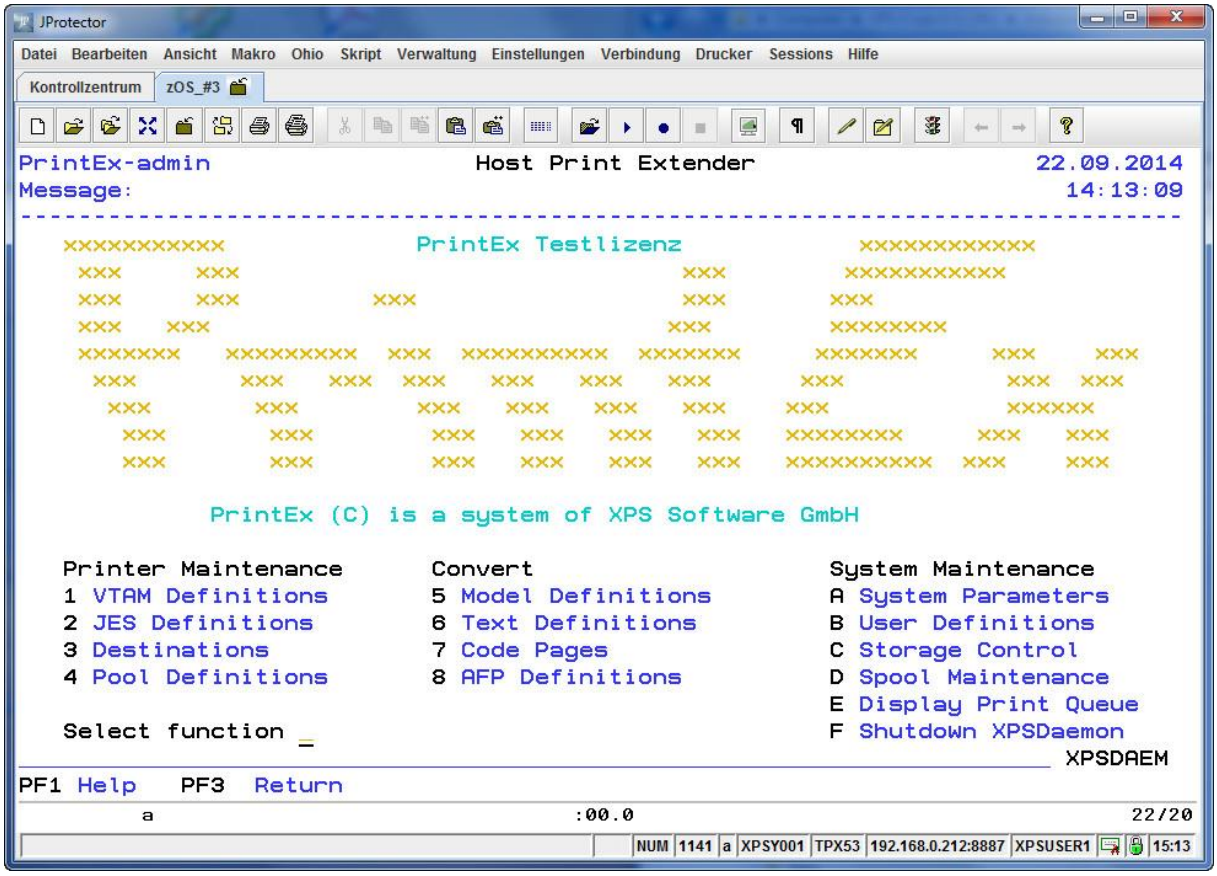


Fig. 8 PrintEx administration menu

The administration menu provides functions in the following three groups:

- Printer Maintenance
- Convert
- System Maintenance

'Printer Maintenance' contains the following functions:

- Creation and administration of VTAM definitions
- Creation and administration of JES definitions
- Creation and administration of destinations
- Creation and administration of pool definitions

The 'Convert' group allows the administrator to attach models, pre- and suffix texts as well as code pages for character translation to any previously defined printer.

In addition the default values for AFP-conversion can be defined here.

'System Maintenance' contains the following functions:

- Administration of the PrintEx system parameters
- Creation and administration of user definitions
- Administration of the internal PrintEx storage fragmentation
- Administration of the PrintEx spool files inclusive printing and deleting
- Overview of the active print tasks inclusive printing and deleting
- Shut down of XPSDaemon/PrintEx

Function keys assigments

PF1 Display the online help.

PF3 Terminate the PrintEx transaction.

Description of the input fields

Select function The desired maintenance function can be chosen entering one of the following digits or characters into this field:

```
1 = VTAM Definitions
2 = JES Definitions
3 = Destinations
4 = Pool Definitions

5 = Model Definitions
6 = Text Definitions
7 = Code Pages
8 = AFP Definitions

A = System Parameters
B = User Definitions
C = Storage Control
D = Spool Maintenance
E = Display Print Queue
F = Shutdown XPSDaemon
```

VTAM Definitions

PrintEx can route output from VTAM applications such as CICS or IMS to TCP/IP printers directly. Thereby PrintEx supports the 'direct socket' protocol, the LPR/LPD protocol and the Internet Print Protocol (IPP).

Data to be printed can be converted into one of the popular printer languages PCL or PostScript. Furthermore the print output can be sent via e-mail as a PDF attachment or can be transferred over FTP.

Routing print output from VTAM applications directly to the JES2/JES3 spool is one of the virtual output capabilities. This enables applications such as CICS or IMS to create JES SYSOUT lists without any programming.

PrintEx supports all 3270 printer types such as LU-1 (SNA/SCS), LU-3 (SNA/DSC) and LU-0 (Non-SNA).

For every SNA printer to be used by PrintEx an entry needs to be defined using the menu option '1 VTAM Definitions'. Additionally each printer must be defined in the VTAM network with a unique APPL definition.

During start up an attempt is made to bind every defined VTAM printer to PrintEx using the VTAM OPEN command. After the VTAM printer has been successfully bound to PrintEx other mainframe sub-systems like CICS and IMS can acquire the VTAM printer. Any subsequent print output of the sub-system to the acquired printer will then be received by PrintEx, converted if necessary, and be routed to the associated destination.

Changes made to any VTAM definitions will be activated immediately.

Choosing the menu option '1 VTAM Definitions' will lead to the screen mask shown below.

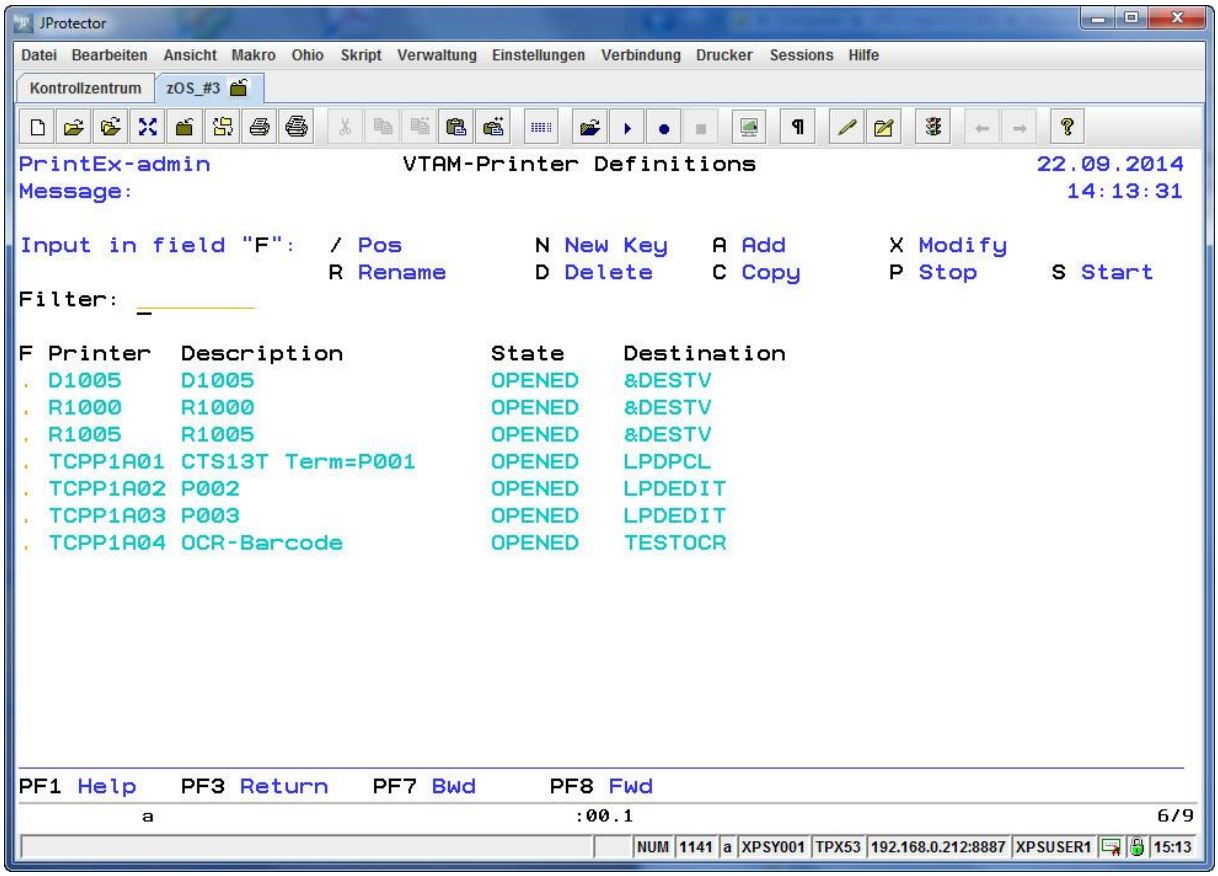


Fig. 9: VTAM Definitions

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

Description of the fields

Filter This field can be used to define a filter for the display.

If, for example, the filter 'XPS' is chosen, only those printers will be listed in the display whose name or description contains the string 'XPS'.

F Choice box for one of the line commands listed in the screen mask header.

Printer The VTAM APPL name of the SNA printer (max. 8 characters long).

Description Up to 20 characters description of the SNA printer.

State Current printer state:

CLOSED The printer is not active.

	OPENED	The printer is active but not acquired.
	applname	The printer is active and acquired by the mentioned application.

Destination Listing of the first three destinations assigned to this printer.

Function selection / line commands

Field 'F' can be used to choose one of the functions listed in the screen mask header.

/	**Pos**

The display will be rearranged moving the selected entry to the top of the list.

N	**New Key**

Using this function a new entry can be selected to be moved to the top of the list.

To achieve this, a window for the input of the new start position is displayed. The input will be processed as a generic name. That is, the first entry found greater or equal to the input name will become the first entry in the list.

R	**Rename**

The selected entry can be renamed using function 'R'.

For the purpose of documentation the current name of the entry will be displayed in the entry mask where the new entry name can be specified. The chosen entry will only be renamed if the newly specified name is unique.

The length of the name of a VTAM printer may not exceed 8 characters.

D	**Delete**

The selected entry can be deleted using function 'D'.

After confirmation by pressing the Enter key the selected entry will be deleted from the index of the VTAM printers. For the purpose of documentation the name of the entry about to be deleted will be displayed in the window asking for the delete confirmation.

All other functions for maintenance of the VTAM printers use the following screen mask:

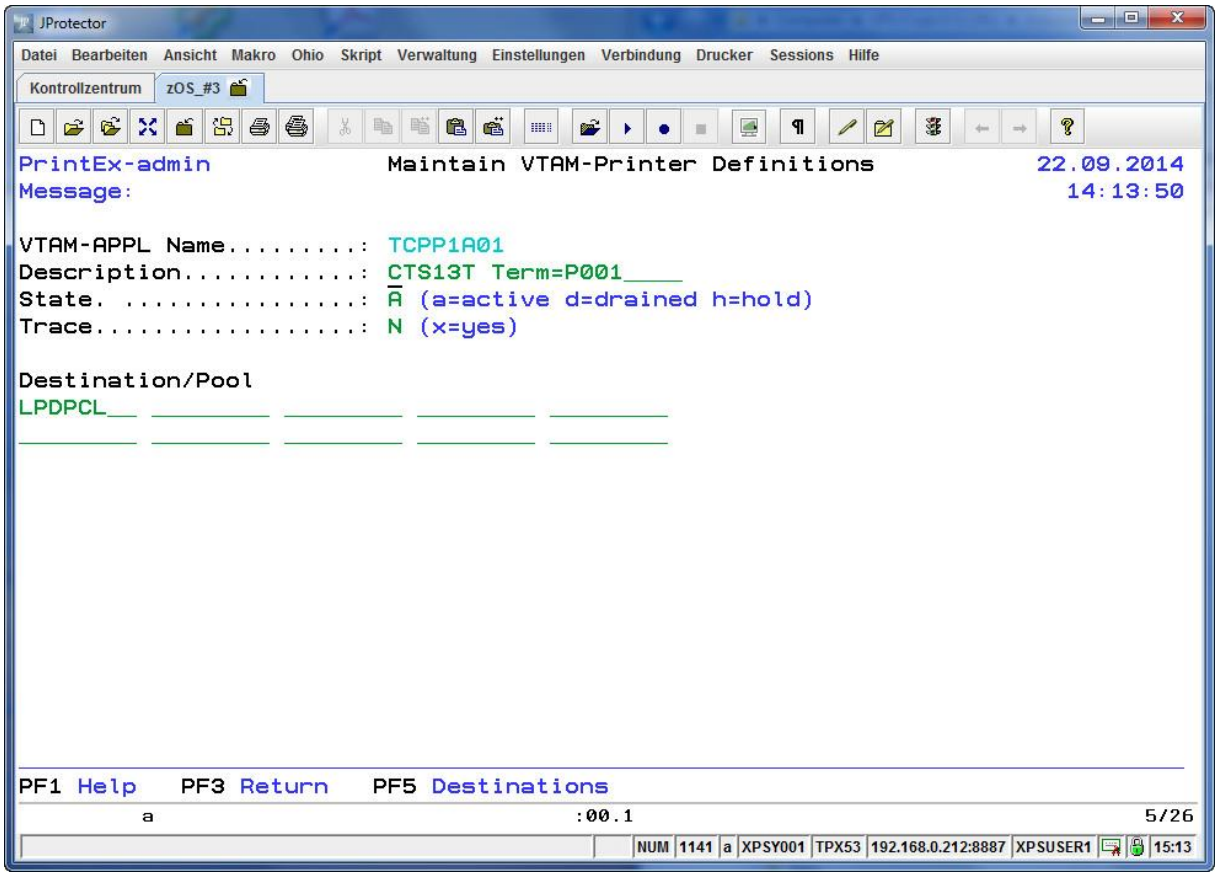


Fig. 10: Create, change and copy VTAM printers

Function key assignments

PF1 Display the online help.

PF3 Return to the index of the VTAM printers.

PF5 Display an overview of the available destinations.

A	**Add**

New entries can be created using function 'A'. The screen mask previously displayed is used to define the printer data.

Description of the input fields

VTAM-APPL Name This is the key for the new printer definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

The printer name must be defined as an APPL-statement in the ACF/VTAM network.

Input for the VTAM-APPL name is required.

Description This field can be used for an optional printer description with up to 20 characters.

State This field can be used to specify the desired initial printer state.

If the default value 'A' is specified, the printer will be opened immediately and during each PrintEx startup. Afterwards the printer is ready to be acquired by sub-systems such as CICS or IMS.

If 'D' is specified the printer state will be drained. If the printer is currently open it will be closed. During a PrintEx startup no action will be undertaken for the printer.

If 'H' is specified the printer state will be hold. This means that the printer will be opened and will be ready for acquisition. However, incoming print data will be stored by PrintEx but will not be sent to the associated destination.

Trace In order to support XPS in the case of error diagnostics PrintEx has a built-in trace facility. By specifying 'X' or 'F' in this field, the PrintEx trace for the printer can be activated. 'X' will result in a small trace while 'F' will lead to a more detailed trace.

Destination/Pool This group of input fields can be used to define up to 10 destinations or pool names for this printer. If the placeholder '&DESTV' is given the used VTAM terminal name will be chosen as destination.

Destinations can be defined using menu selection '3 Destinations' and pool names can be defined using menu selection '4 Pool Definitions'.

As soon as print data arrives for the printer, PrintEx will send the print data to each destination and/or to the first reachable destination from the pool.

X Modify

Existing VTAM printer definitions can be modified using function 'X'. Selecting this function will display the input screen mask shown in Fig. 10 on page 27.

The screen mask will contain the definitions previously made for the printer which can be modified by overwriting them.

C Copy

An existing VTAM printer definition can be copied using function 'C'.

P Stop

Active VTAM printers can be stopped using function 'P' which means that the printer will be closed in the ACF/VTAM network.

The VTAM printer state will change from 'ACTIVE' to 'CONCT'.

Stopping a printer has only a temporary effect. The next time PrintEx is started, the printer will have its initial state as defined above.

S Start

Inactive VTAM printers can be started using function 'S' which means that the printer will be opened in the ACT/VTAM network if possible.

The VTAM printer state will change from 'CONCT' to 'ACTIVE' enabling sub-systems such as CICS and IMS to acquire the printer for output.

Starting a printer has only a temporary effect. The next time PrintEx is started, the printer will have its initial state as defined above.

JES Definitions

PrintEx can route output from the JES2 and the JES3 spool to TCP/IP printers directly. Thereby PrintEx supports the 'direct socket' protocol, the LPR/LPD protocol and the Internet Print Protocol (IPP).

Data to be printed can be converted into one of the popular printer languages PCL or PostScript. Furthermore the print output can be sent via e-mail as a PDF attachment or can be transferred over FTP. Additionally it is possible to print JES spoolfiles on SCS-printers directly or to archive print output in the PrintEx spool file.

PrintEx supports the SYSOUT record formats 'variable', 'fixed' and 'undefined' as well as the control character types 'ASA', 'machine' and 'none'.

In order to make it easy to distinguish between the print outputs from different jobs, PrintEx allows the use of separator pages. During installation five standard separator start pages and end pages are copied to the PrintEx macro library.

Furthermore it is possible to define individual separator pages using simple commands. How this is achieved is explained in chapter 'Separator Pages' on page 152.

For every JES selection to be used with PrintEx an entry needs to be defined using the menu option '2 JES Definitions'.

Each JES selection will be built using the criteria 'Destination', 'Class', 'Writer' and 'Form'.

As soon as the JES2/JES3 spool reports to PrintEx the prescence of output data, PrintEx compares the previously mentioned selection criteria of the output data with all available JES definitions.

PrintEx will select for output the JES definition having the largest number of matching output data characteristics compared with the selection criteria.

PrintEx will not allow the definition of two JES definitions having identical selection criteria.

Changes made to any JES definition will be activated immediately.

Choosing the menu option '2 JES Definitions' will lead to the screen mask shown below.

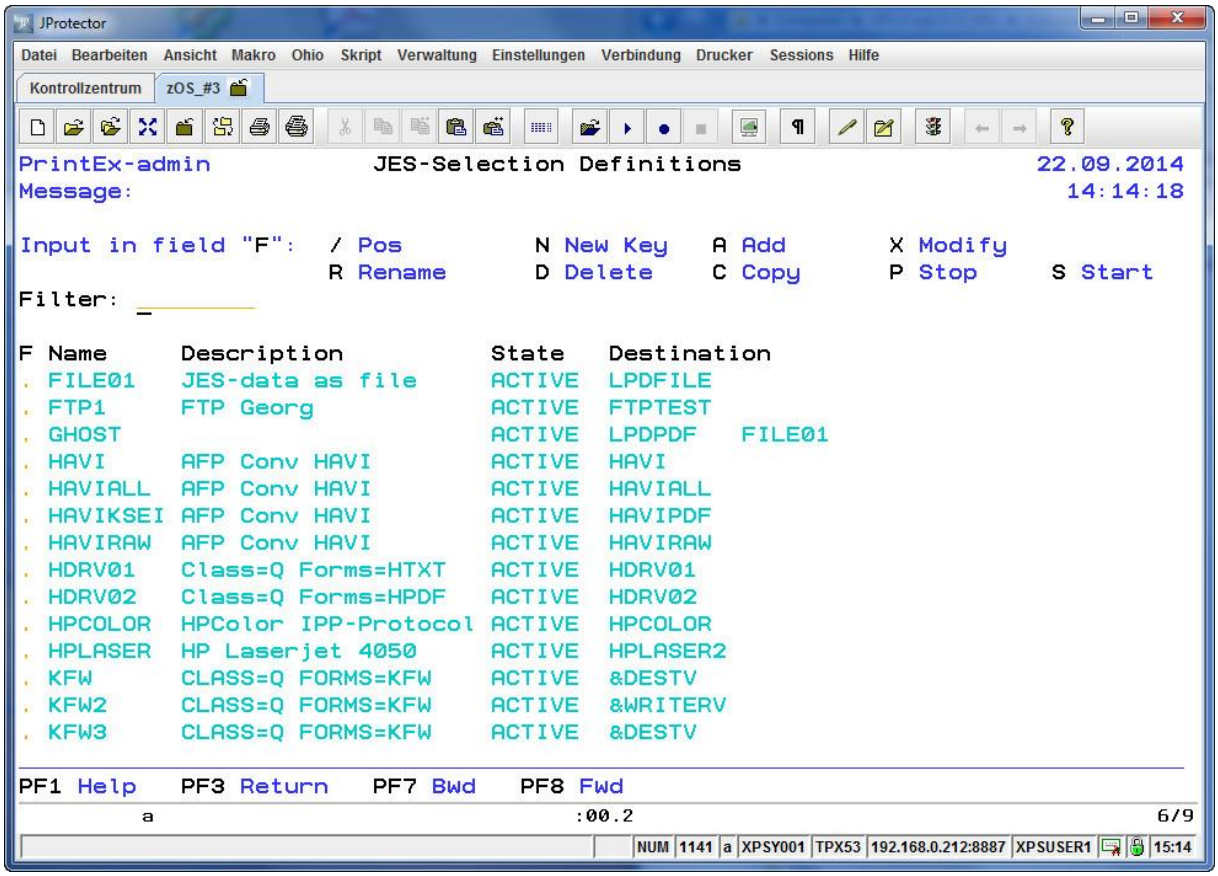


Fig. 11: JES Definitions

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

Description of the fields

Filter This field can be used to define a filter for the display.

If, for example, the filter 'XPS' is chosen, only those printers will be listed in the display whose name or description contains the string 'XPS'.

F Choice box for one of the functions listed in the screen mask header.

Name Name of the JES printer (max. 8 characters long).

Description Up to 20 characters description of the JES printer.

State Current printer state:

DRAINED	The printer is not active. Selection criteria specified for the printer will not be considered.
ACTIVE	The printer is active. Selection criteria specified for the printer will be considered.
HOLD	The printer is active. Selection criteria specified for the printer will be considered. Print output data will not be transferred to the defined destinations.

Destination Listing of the first three destinations assigned to this printer.

Function selection

Field 'F' can be used to choose one of the functions listed in the screen mask header.

/ Pos

The display will be rearranged moving the selected entry to the top of the list.

N New Key

Using this function a new entry can be selected to be moved to the top of the list.

To achieve this, a window for the input of the new start position is displayed. The input will be processed as a generic name. That is, the first entry found greater or equal to the input name will become the first entry in the list.

R Rename

The selected entry can be renamed using function 'R'.

For the purpose of documentation the current name of the entry will be displayed in the entry mask where the new entry name can be specified. The chosen entry will only be renamed if the newly specified name is unique.

The length of the name of a JES printer may not exceed 8 characters.

D Delete

The selected entry can be deleted using function 'D'.

After confirmation by pressing the Enter key the selected entry will be deleted from the index of the JES printers. For the purpose of documentation the name of the entry about to be deleted will be displayed in the window asking for the delete confirmation.

All other functions for maintenance of the JES printers use the following screen mask:

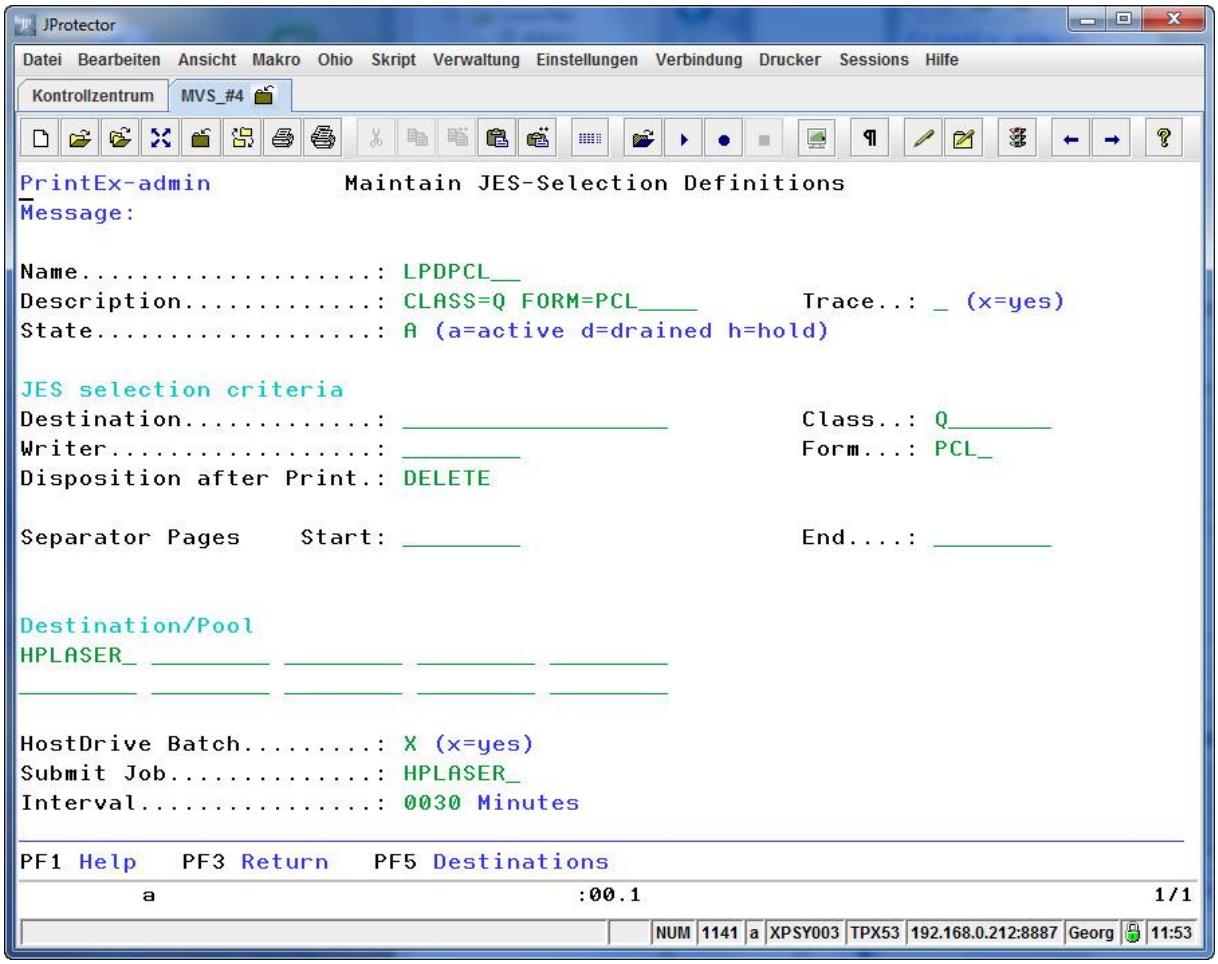


Fig. 12: Create, change and copy JES printers

Function key assignments

PF1 Display the online help.

PF3 Return to the index of the JES printers.

PF5 Display an overview of the available destinations.

A	**Add**

New JES printers can be created using function 'A'. The screen mask previously displayed is used to define the printer data.

Description of the input fields

Name This is the key for the new printer definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description This field can be used for an optional printer description with up to 20 characters.

State This field can be used to specify the desired initial printer state.

If the default value 'A' is specified, the criteria to select output from JES for the printer will be activated immediately and during a new PrintEx startup.

If 'D' is specified the printer state will be drained and the specified selection criteria will not be considered.

If 'H' is specified the printer state will be hold. This means that the criteria to select output from JES will be activated immediately. However, incoming print data will be stored by PrintEx but will not be sent to the associated destination.

Trace In order to support XPS in the case of error diagnostics PrintEx has a built-in trace facility. By specifying 'X' or 'F' in this field, the PrintEx trace for the printer can be activated. 'X' will result in a small trace while 'F' will lead to a more detailed trace.

JES selection criteria JES printers will be created based on the selection criteria 'Destination', 'Class', 'Writer' and 'Form'.

As soon as the JES2/JES3 spool reports to PrintEx the prescence of output data, PrintEx compares the selection criteria of the output data with the defined JES printers.

PrintEx will select for output the JES definition having the largest number of matching output data characteristics compared with the selection criteria. After a JES printer has been selected, the output data will be sent to all defined destinations.

Any combination of the various selection criteria can only defined once.

Changes made to any JES definitions will be activated immediately.

Destination This is the input field for the SYSOUT destination for the printer.

Class This is the input field for the SYSOUT class for the printer. Up to 8 classes can be defined for a JES printer.

Writer This is the input field for the SYSOUT external writer for the printer.

Form This is the input field for the SYSOUT form for the printer.

Disposition after Print The disposition of the JES2/JES3 spool file after printing can be specified using this input field. Possible values are 'DELETE', 'HOLD' and 'KEEP'.

Separator Pages If PrintEx shall insert separator pages, the names of the documents containing the separator pages can be specified using these input fields. Standard start pages named 'SEP#S01' through 'SEP#S05' as well as standard end pages named 'SEP#E01' through 'SEP#E05' are copied to the PrintEx macro library during installation. Furthermore it is possible to define installation specific separator pages. How to do this is explained in the chapter 'Separator Pages' on page 152.

Destination/Pool This group of input fields can be used to define up to 10 destinations or pool names be defined for this printer.

Destinations can be defined using menu selection '3 Destinations' and pool names can be defined using menu selection '4 Pool Definitions'.

As soon as print data arrives for the printer, PrintEx will send the print data to each destination and/or to the first reachable destination from the pool.

If '&DEST' is defined PrintEx will use the JES destination (DEST) from the originating job control as the PrintEx destination.

If '&WRITER' is defined PrintEx will use the JES external writer destination (WTR) from the originating job control as the PrintEx destination.

HostDrive Batch Besides an installation as a stand alone print server, PrintEx can be licensed as an option to the product HostDrive from XPS. HostDrive can be used for the automation of file transfers between arbitrary platforms. If PrintEx is licensed as an option to HostDrive this has to be indicated by setting an 'X' for this parameter. Otherwise accessing JES files from HostDrive won't be possible. If this option is activated zOS jobs will be able to access JES lists using the HostDrive batch interface. This behaviour can be automated using the followingt two options.

Submit Job This option can be used to specify the name of a zOS batch job that shall be launched by PrintEx automatically after the time interval specified with the following parameter has elapsed. Thus the processing of JES-output from batch jobs using the HostDrive interface can be automated.

Interval If PrintEx shall launch a zOS batch job to process JES lists regularly using the HostDrive batch interface, the interval in minutes to elapse between the single job executions can be specified here.

X Modify

Existing JES printer definitions can be modified using function 'X'. Selecting this function will display the input screen mask shown in Fig. 12 on page 33.

The screen mask will contain the definitions previously made for the printer which can be by overwriting them.

C Copy

An existing JES printer definition can be copied using function 'C'.

P Stop

Active JES printers can be stopped using function 'P' which means that the selection criteria for the printer will no longer be respected.

Stopping a printer has only a temporary effect. The next time PrintEx is started, the printer will have its initial state.

S Start

Inactive JES printers can be started using function 'S' which means that the selection criteria for the printer will be respected.

Starting a printer has only a temporary effect. The next time PrintEx is started, the printer will have its initial state.

Destinations

Every destination used in the definition of VTAM and JES printers must be defined using the menu selection '3'.

PrintEx supports the following destination types:

- TCP/IP
- JES
- SNA
- eMail
- File
- RAW
- FTP

The various destination types make it possible to transfer print output from sub-systems such as CICS and IMS as well as print output from the JES2/JES3 spool to TCP/IP network printers, into the JES2/JES3 spool and to SCS printers. Furthermore print output can be sent as PDF attachment via e-mail and can be transferred using the FTP protocol. Finally the print output can be archived in the PrintEx spool file.

PrintEx can route print output to up to 10 different destinations. Similar destinations can be grouped in pools, which are defined using menu selection '4'. If a pool entry is chosen as destination PrintEx will use as target the first reachable destination from the pool.

Choosing the menu option '3 Destinations' will lead to the screen mask shown below.

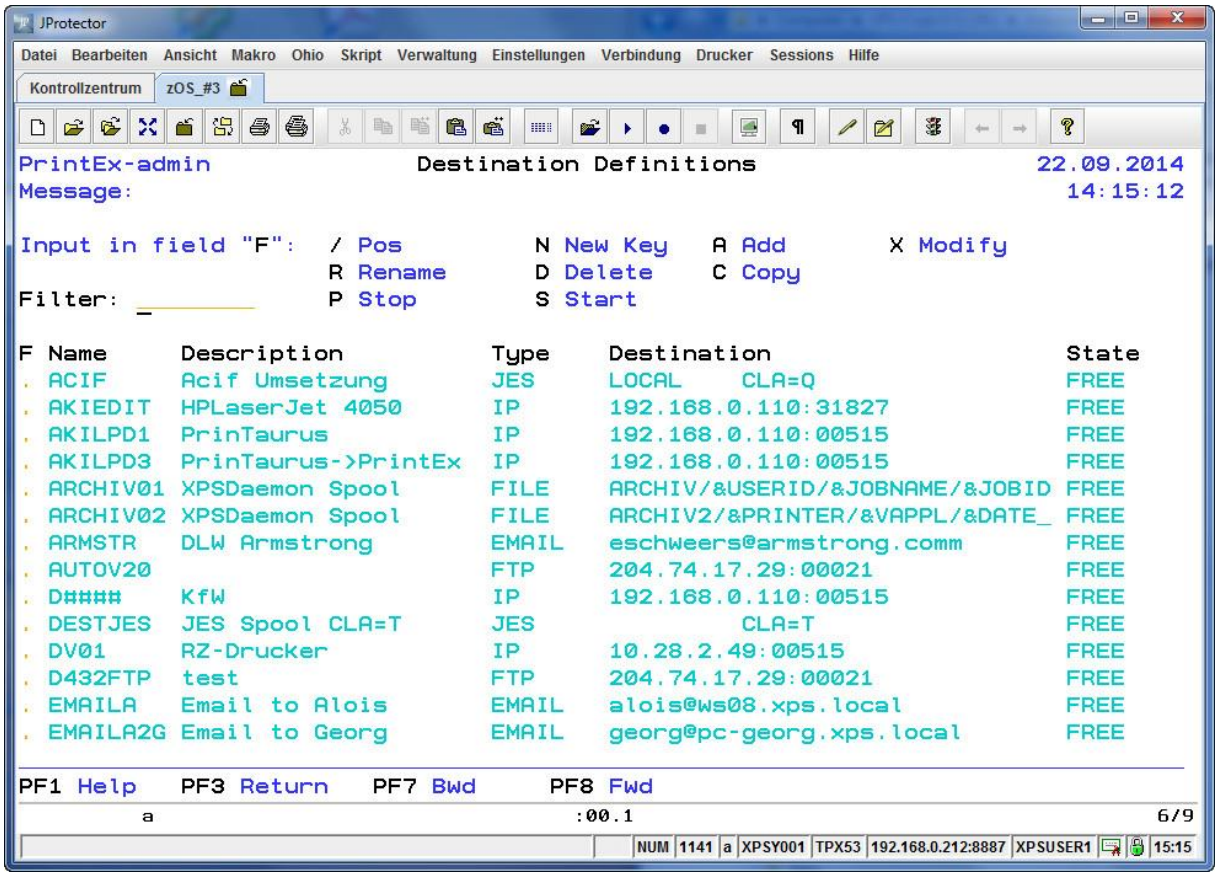


Fig. 13: Destinations

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

Description of the fields

Filter This field can be used to define a filter for the display.

If, for example, the filter 'XPS' is chosen, only those printers will be listed in the display whose name or description contains the string 'XPS'.

F Choice box for one of the functions listed in the screen mask header.

Name The name of the destination (max 8 characters long).

Description Up to 20 characters description of the destination.

Type The type of the destination:

TCP/IP	Destination defines TCP/IP network printer.
JES	Destination defines the JES2/JES3 spool.
SNA	Destination defines a SCS pritner.
EMAIL	Destination defines a PFD attachment for an e-mail.
FILE	Destination defines a PrintEx spool file.
RAW	Destination defines a raw (binary) target at the IP-address.
FTP	Destination defines a FTP Server.

Destination This field displays the first 30 characters of the destination.

State The current state of the destination:

FREE The destination is free.

BUSY The destination is in use.

If output is to be transmitted to a destination that is currently in use, PrintEx will periodically try to deliver the output again after the time defined as 'Print Restart Interval' has been reached.

Function selection

Field 'F' can be used to choose one of the functions listed in the screen mask header.

/	Pos

The display will be rearranged moving the selected entry to the top of the list.

N	New Key

Using this function a new entry can be selected to be moved to the top of the list.

To achieve this, a window for the input of the new start position is displayed. The input will be processed as a generic name. That is, the first entry found greater or equal to the input name will become the first entry in the list.

R	Rename

The selected entry can be renamed using function 'R'.

For the purpose of documentation the current name of the entry will be displayed in the entry mask where the new entry name can be specified. The chosen entry will only be renamed if the newly specified name is unique.

The length of the name of a destination may not exceed 8 characters.

D	Delete

The selected destination can be deleted using the function 'D'.

After confirmation by pressing the Enter key the selected entry will be deleted from the index of the destinations. For the purpose of documentation the name of the entry about to be deleted will be displayed in the window asking for the delete comfirmation.

All other functions for maintenance of the destinations use the following screen mask:

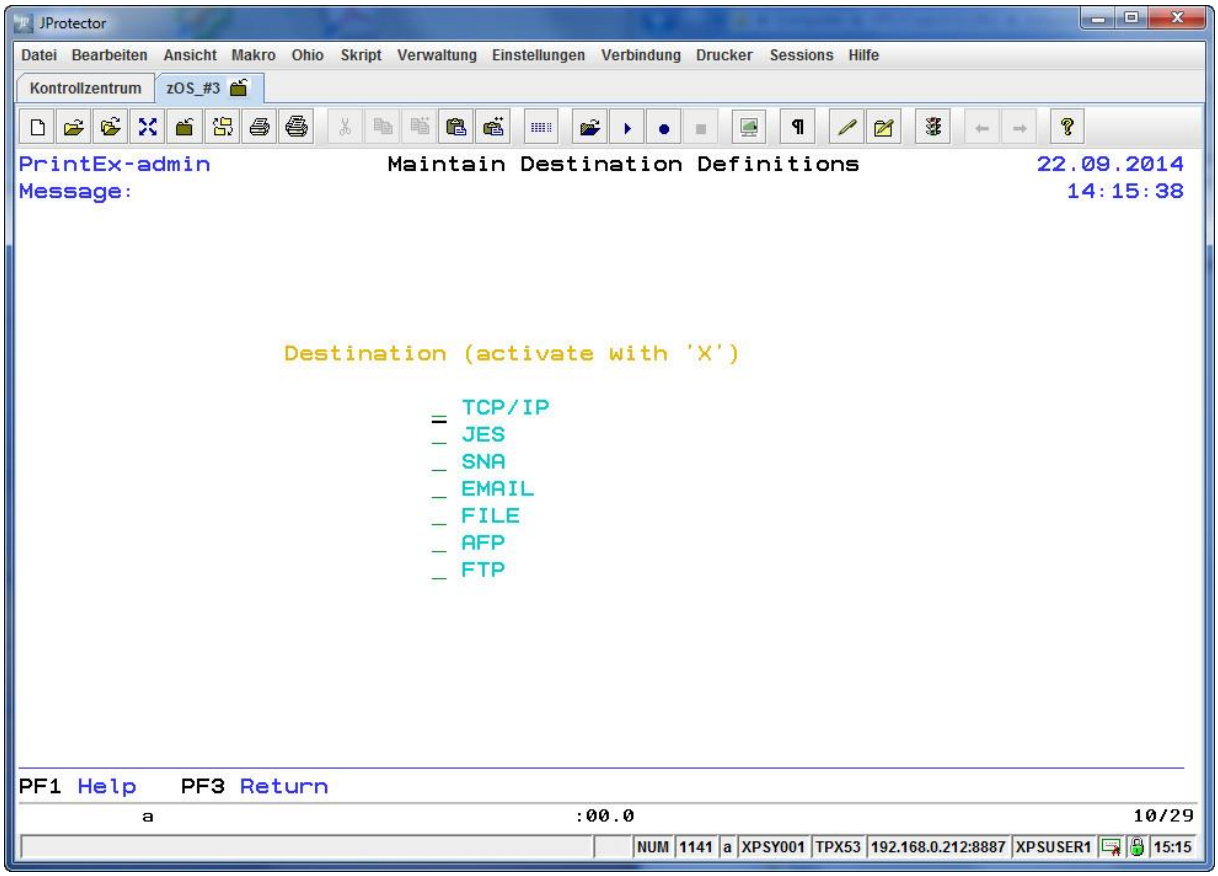


Fig. 14: Maintain Destination Definitions

Function key assignments

PF1 Display the online help.

PF3 Return to the index of the destinations.

Choosing the type of the destination

If one of the functions 'A – Add', 'C – Copy' or 'X – Modify' is chosen, the type of the destination must be selected from the following available choices:

TCP/IP	-	TCP/IP network printer
JES	-	JES2/JES3 spool
SNA	-	VTAM-SCS printer
EMAIL	-	e-mail with PDF attachment
FILE	-	PrintEx spool file
RAW	-	binary transmission to the given IP address
FTP	-	transmission by FTP protocol to an FTP server

Define a TCP/IP destination

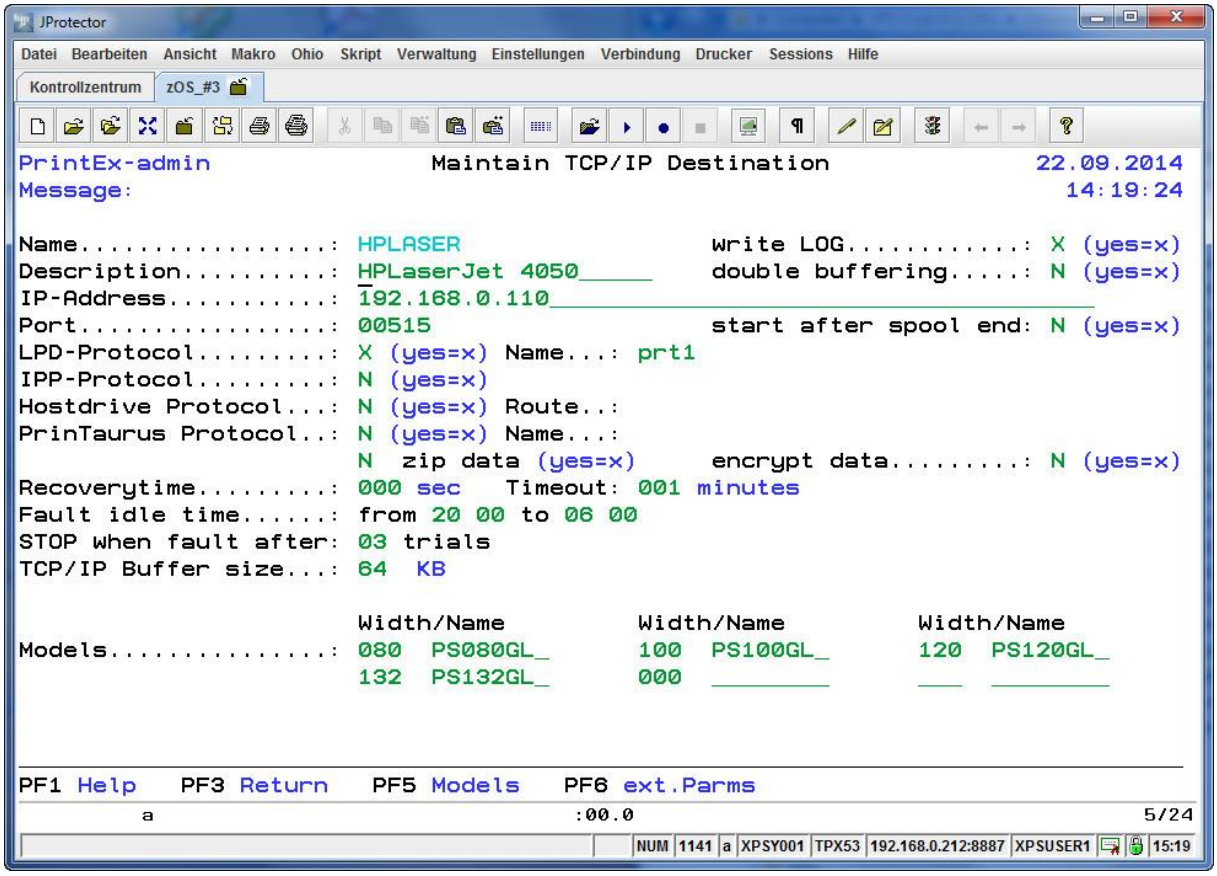


Fig. 15: Define a TCP/IP destination

PrintEx is able to directly transmit output from the JES2 and JES3 spool as well as output from VTAM applications to TCP/IP network printers.

PrintEx supports LPR/LPD, 'direct socket' and Internet Print Protocol (IPP) protocols.

Data to be printed can be converted into one of the popular printer languages PCL or PostScript.
New TCP/IP destinations can be created using function 'A'. The screen mask previously displayed is used to define the destination data.

Description of the input fields

Name

This is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description

This field can be used for an optional description of the destination with up to 20 characters.

write LOG

If the option to write log entries has been globally deactivated in the system parameters, this can be activated individually for the destination by choosing 'X' for this option. If the option is set, PrintEx will write protocol entries if output will be sent to this destination.

double buffering In order to achieve uninterrupted printing on high-speed printers such as the IBM Infoprint 6500, double buffering can be activated for a destination. This will boost the print speed at the expense of memory use.

IP-Address The TCP/IP address of the network printer or its DNS name.

Port The TCP/IP port of the network printer. If the 'direct socket' protocol is selected port 9100 must be specified. For the LPR/LPD protocol port 515 must be chosen.

start after spool end If this option is selected, PrintEx will not transfer arriving print output data immediately to the printer, but will firstly collect all data and then send the complete data to the printer using a single TCP/IP call.

Choosing this option only makes sense for high-speed printers to achieve delayless printing. Again, as in case of double buffering, this option will boost the print speed at the expense of memory use.

LPD-Protocol If this option is chosen, PrintEx will send the print data to the previously defined IP address using the LPD/LPR protocol.

Name If the LPD/LPR protocol has been chosen for data transmission, using this option a LPD/LPR printer name can be defined which will be transmitted to the LPD/LPR server during session establishment. If left out, PrintEx will transmit as printer name the JES printer name or the VTAM printer name.

IPP-Protocol If this option is chosen print data will be enveloped into HTTP packages and will be transmitted to the previously defined IP address using the Internet Print Protocol (IPP).

Hostdrive Protocol If this option is selected print data will be sent to the previously defined IP address using the XPS HostDrive protocol.

HostDrive is a cross platform queuing system from XPS.

Route If the HostDrive protocol has been chosen, a XPS HostDrive route must be specified as receiver of the transmitted print data.

PrinTaurus Protocol If this option is selected print data will be sent to the specified PrinTaurus server using the PrinTaurus transfer protocol.

PrinTaurus is a network output management system from AKI GmbH, Würzburg.

Name This option can be used to define the printer name of the PrinTaurs target system.

zip data If this option is chosen the z/OS print output data will be compressed before it'll be transmitted from PrintEx to PrinTaurus.

encrypt data If this option is chosen the z/OS print output data will be encrypted befort it'll be transmitted from PrintEx to PrinTaurus.

Recoverytime This option can be used to specify a time interval in seconds that PrintEx shall wait until the next attempt if the connection establishment with the TCP/IP address has failed.

If the next attempt to establish a connection with the TCP/IP target fails, PrintEx uses the value of the system parameter 'Print Restart Interval' for subsequent attempts to establish the connection.

Timeout

If an error occurs while processing print output, e. g. because a printer is not online or a paper jam has occurred, using this option a time interval in minutes can be specified, which PrintEx will wait before the transmission of print data us re-tried.

STOP when fault after

This option specifies the maximum number of attempts to transmit print output to a printer in error before the printer will be stopped by PrintEx.

If a connection with the printer has been successfully established the internal error counter for the printer will be reset to zero.

Use of this option avoids multiple, superfluous printouts of the same data. This is especially useful for large printouts.

Data that has not yet been printed when the error occurs can be printed out later manually using the function 'E Display Print Queue'.

TCP/IP Buffer size

Data will be transmitted to the destination using a TCP/IP buffer size specified with this option. If no specific buffer size is defined for this printer, PrintEx will use the standard buffer size which is defined in the system parameters. If possible, buffers should not be dimensioned too small because the buffer size will have a great impact on transmission speed.

Models

PrintEx uses so-called 'models' for the conversion of print data. Every destination must be connected with at least one model.

Models are used to define a number of options, e. g., the code page to be used for EBCDIC to ASCII translation, prefix data and suffix data to be inserted into the print data stream and transformation rules for control characters such as page feed, line feed, carriage return, back space and channel selection.

PrintEx comes with a number of predefined models for standard conversions like conversion of the print output to the PCL printer language, to PostScript and to Adobe PDF.

For each model the maximum width and the name of the model must be specified.

It is possible to assign as many as six models to a single destination. This makes it easier to use different models for output which varies only in the number of characters per line by specifying models which vary only in the font size specified.

When the placeholder '&FCB' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select.

When the placeholder '&FCBFORM' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select. Additionally, the FORMS parameter of the JES spool file being processed will be used to select an additional prefix data text. If any Forms prefix has been defined in the system parameters, this will be used as a prefix for the Forms value in order to generate the name of the additional prefix data text at runtime. Using two prefix data texts makes it possible to encapsulate static prefix data for every print out in one common prefix data text and to add variable prefix data through the Forms parameter if this should be desired.

If the placeholder '%AFP' is used as model name, print data will be converted to the AFP format based on the JCL options for 'CHARS', 'FORMDEF' and 'PAGEDEF'. The complete pool of AFP resources such as overlays, font etc. will be included in the generated AFP format.

If the placeholder '%AFPPS' is used as model name, print data will be converted to the AFP format based on the JCL options for 'CHARS', 'FORMDEF' and 'PAGEDEF'. Subsequent to the AFP conversion the output will be converted to PostScript for output to any network printer.

If the placeholder '%AFPPDF' is used as model name, print data will be converted to the AFP format based on the JCL options for 'CHARS', 'FORMDEF' and 'PAGEDEF'. Subsequent to the AFP conversion the output will be converted to Adobe PDF, e. g., for transmission of the data as an e-mail attachment or for archiving.

Define a JES destination

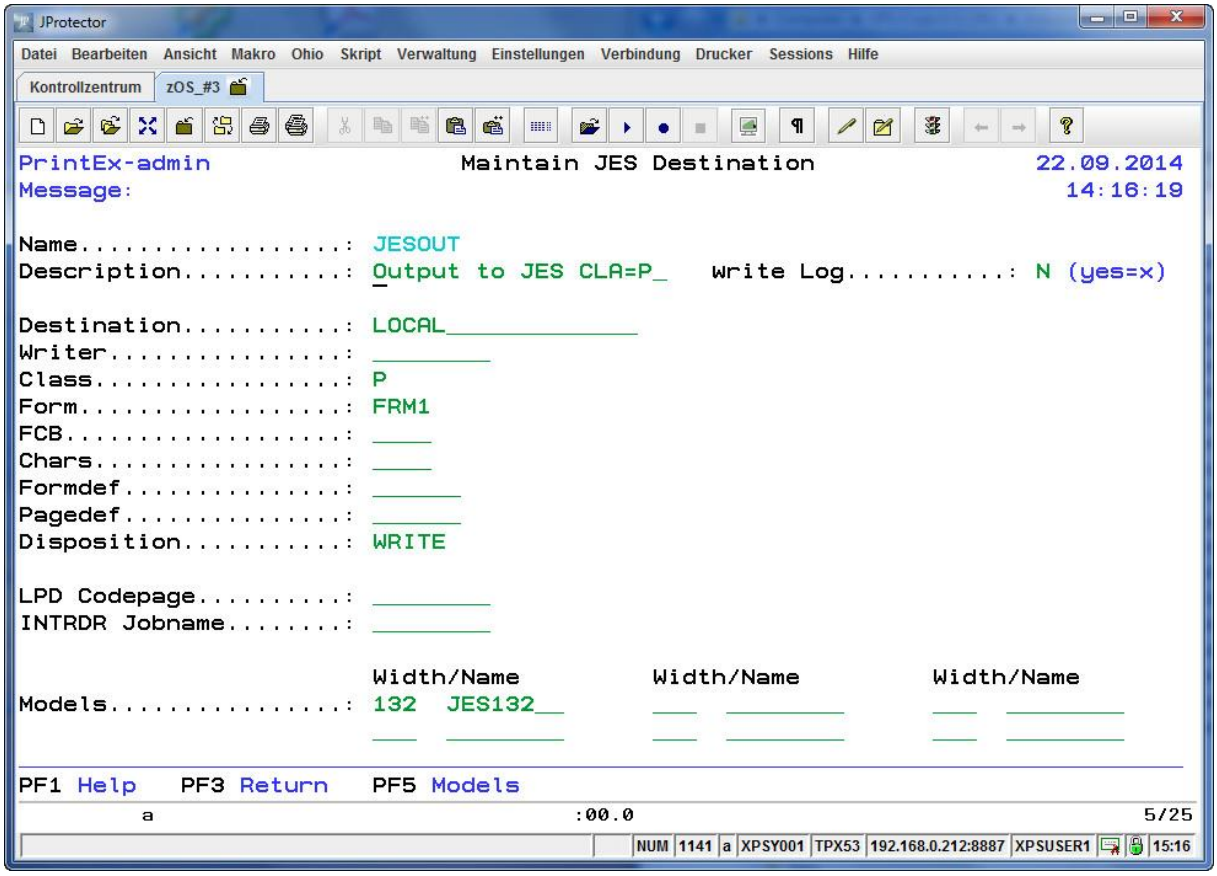


Fig. 16: Define a JES destination

PrintEx makes it possible to save output from VTAM applications such as CICS or IMS in the JES2/JES3 spool. Also data received over the PrintEx LPD daemon can be stored in the JES2/JES3 spool.

New JES destinations can be created using function 'A'. The screen mask previously displayed is used to define the destination data.

Description of the input fields

Name

This is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description

This field can be used for an optional description of the destination with up to 20 characters.

write LOG

If the option to write log entries has been globally deactivated in the system parameters, this can be activated individually for the destination by choosing 'X' for this option. If the option is set, PrintEx will write protocol entries if output will be sent to this destination.

Destination

Using this option the destination ('DEST=') for the created SYSOUT list can be specified.

Writer Using this option the external writer ('WRITER=') for the created SYSOUT list can be specified.

Class Using this option the output class ('CLASS=') for the created SYUSOUT list can be specified.

Form Using this option the form name ('FORMS=') for the created SYSOUT list can be specified.

FCB Using this option the forms control buffer ('FCB=') for the created SYSOUT list can be specified.

Chars Using this option the character set ("CHARS=') for the created SYSOUT list can be specified.

Formdef Using this option the form definition ("FORMDEF=') for the created SYSOUT list can be specified.

Pagedef Using this option the page definition ("PAGEDEF=') for the created SYSOUT list can be specified.

Disposition Using this option the disposition ('DISP=') for the created SYSOUT list can be specified.

LPD Codepage If PrintEx will receive external data via the LPD daemon (port 515), the incoming data must be translated to EBCDIC. PrintEx will use the codepage specified with this option to do so.

INTRDR Jobname If PrintEx shall submit a job to JES using the INTRDR, the name of a JCL template file to be submitted can be specified with this option. The template file must be a member in the XPSDATA dataset.

Models PrintEx uses so-called 'models' for the conversion of print data. Every destination must be connected with at least one model.

Models are used to define a number of options, e. g., the code page to be used for EBCDIC to ASCII translation, prefix data and suffix data to be inserted into the print data stream and transformation rules for control characters such as page feed, line feed, carriage return, back space and channel selection.

PrintEx comes with a number of predefined models for standard conversions like conversion of the print output to the PCL printer language, to PostScript and to Adobe PDF.

For each model the maximum width and the name of the model must be specified.

It is possible to assign as many as six models to a single destination. This makes it easier to use different models for output that varies only in the number of characters per line by specifying models that vary only in the used font size.

When the placeholder '&FCB' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select.

When the placeholder '&FCBFORM' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select. Additionally, the FORMS parameter of the JES spool file in work will be used to select an additional prefix data text. If any Forms prefix has been defined in the system parameters, this will be used as a prefix for the Forms value in order to generate the name of the additional prefix data text at runtime. Using two prefix data texts makes it possible to encapsulate static prefix data for every print out in one common prefix data text and to add variable prefix data through the Forms parameter if this should be desired.

Define a SNA destination

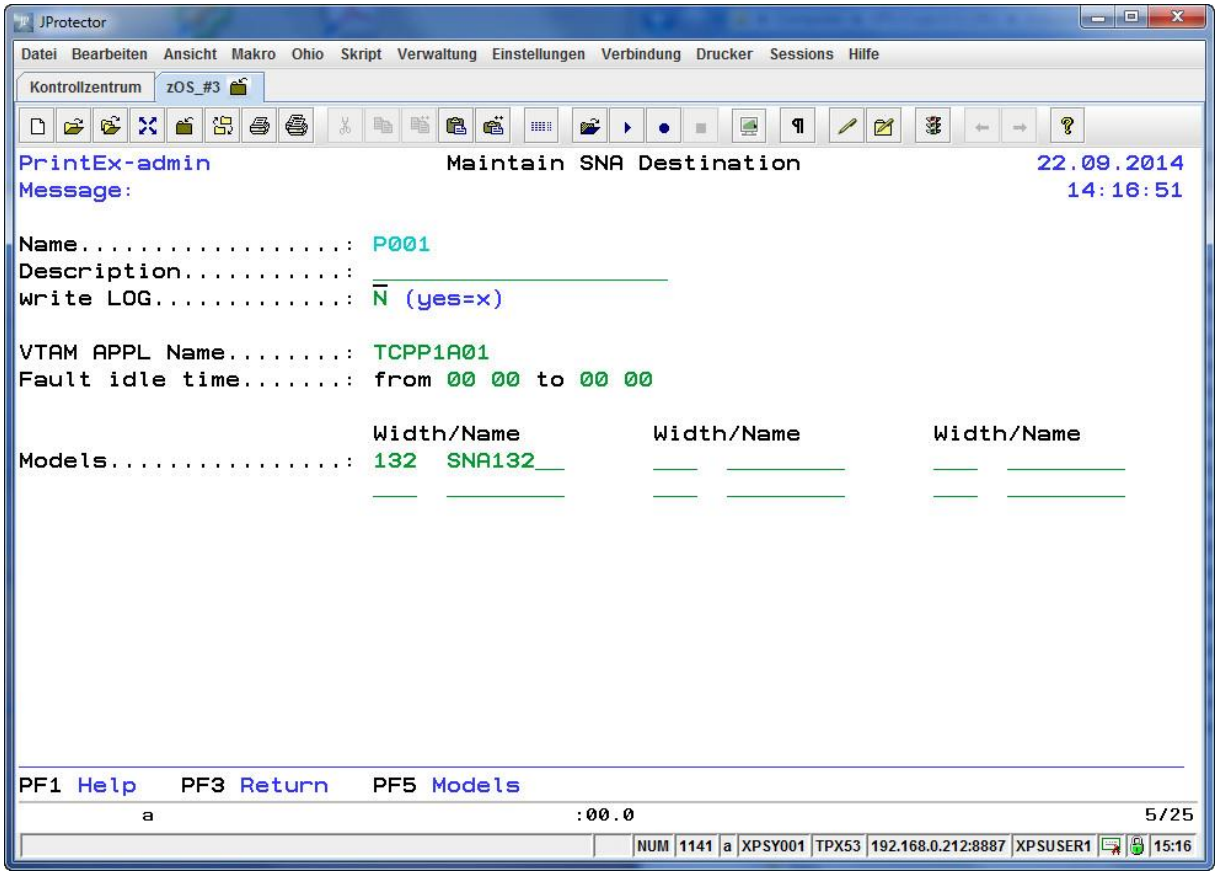


Fig. 17: Define a SNA destination

PrintEx is able to directly transmit print data from JES2 and JES3 spool files to SCS printers.

New SNA destinations can be created using function 'A'. The screen mask previously displayed is used to define the destination data.

Description of the input fields

Name

This is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description

This field can be used for an optional description of the destination with up to 20 characters.

write LOG

If the option to write log entries has been globally deactivated in the system parameters, this can be activated individually for the destination by choosing 'X' for this option. If the option is set, PrintEx will write protocol entries if output will be sent to this destination.

VTAM APPL Name The VTAM APPL name of the SCS printer is defined with this option. If data is available for this destination, the data will be converted into an SCS datastream (LUType 1) and will be transmitted to the specified VTAM APPL. If the printer is currently bound to another application (e. g. CICS), PrintEx tries to automatically acquire the printer. The printer will be available for other applications as soon as the PrintEx print job has ended.

Fault idle time If a printer error occurs while PrintEx tries to deliver print data, e. g. because the printer is offline, using this option PrintEx can be instructed not to try to deliver print output to the affected printer in the time interval specified here

Models PrintEx uses so-called 'models' for the conversion of print data. Every destination must be connected with at least one model.

Models are used to define a number of options, e. g., the code page to be used for EBCDIC to ASCII translation, prefix data and suffix data to be inserted into the print data stream and transformation rules for control characters such as page feed, line feed, carriage return, back space and channel selection.

PrintEx comes with a number of predefined models for standard conversions like conversion of the print output to the PCL printer language, to PostScript and to Adobe PDF.

For each model the maximum width and the name of the model must be specified.

It is possible to assign as many as six models to a single destination. This makes it easier to use different models for output that varies only in the number of characters per line by specifying models that vary only in the used font size.

When the placeholder '&FCB' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select.

When the placeholder '&FCBFORM' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select. Additionally, the FORMS parameter of the JES spool file in work will be used to select an additional prefix data text. If any Forms prefix has been defined in the system parameters, this will be used as a prefix for the Forms value in order to generate the name of the additional prefix data text at runtime. Using two prefix data texts makes it possible to encapsulate static prefix data for every print out in one common prefix data text and to add variable prefix data through the Forms parameter if this should be desired.

Define an e-mail destination

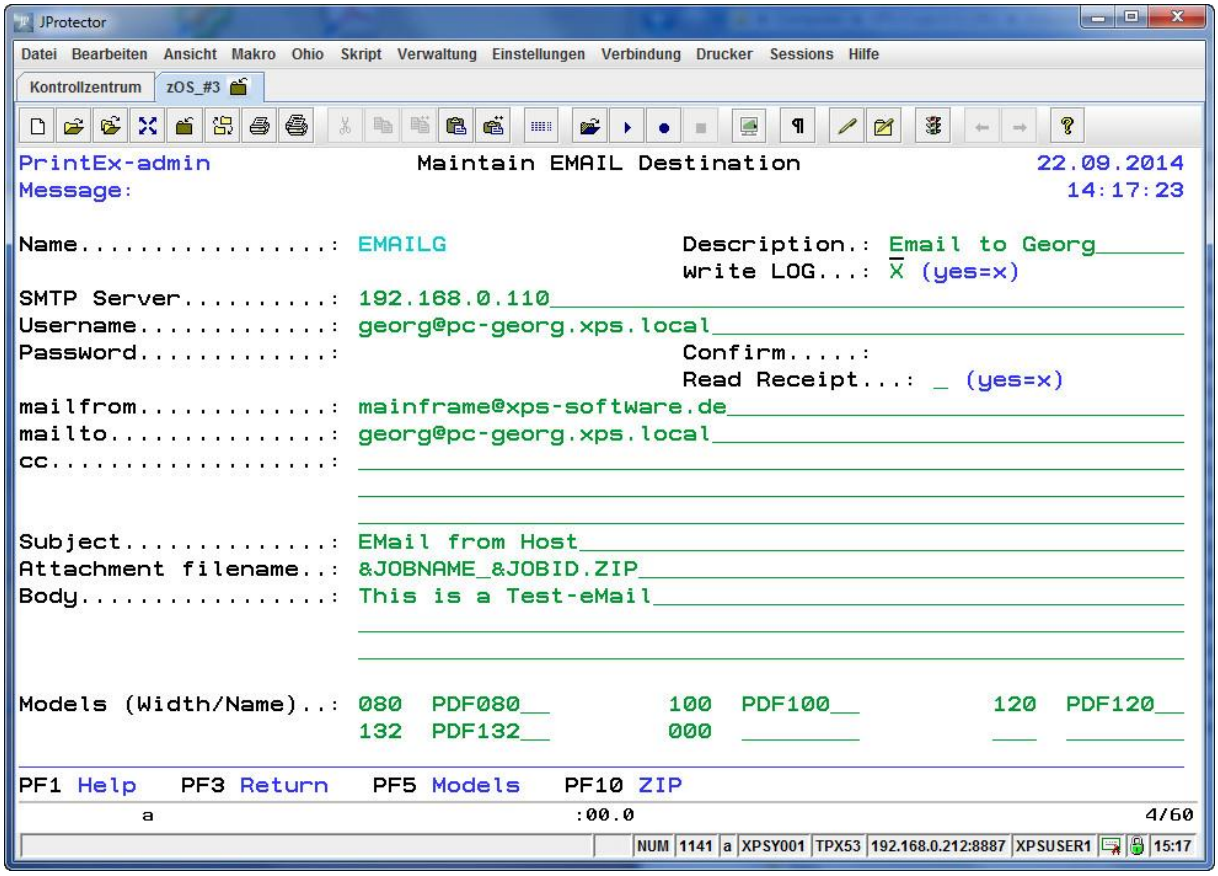


Fig. 18: Define an e-mail destination

PrintEx can be used to send output from JES2/JES3 and from VTAM applications such as CICS or IMS to an e-mail address over TCP/IP using the Simple Mail Transfer Protocol (SMTP). The output data will be attached as a PDF to the e-mail. The Multipurpose Internet Mail Extensions Format (MIME) will be used and the attached PDF will be BASE64 encoded.

Due to the fact that PrintEx supports the SMTP protocol there is no need to install SMTP on the system (OS/390, z/OS).

New e-mail destinations can be created using function 'A'. The screen mask previously displayed is used to define the destination data.

Description of the input fields

Name

This is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description

This field can be used for an optional description of the destination with up to 20 characters.

write LOG If the option to write log entries has been globally deactivated in the system parameters, this can be activated individually for the destination by choosing 'X' for this option. If the option is set, PrintEx will write protocol entries if output will be sent to this destination.

SMTP Server This is the TCP/IP address or the DNS name of the e-mail server to which the output data is to be sent using the SMTP protocol.

Username If the SMTP server requires authentication, the user name to be used for the logon must be specified with this option.

Password If the SMTP server requires authentication, the password to be used for the logon must be specified with this option.

Confirm If the SMTP server requires authentication, the password to be used for the logon must be specified with this option for the purpose of confirmation.

mailfrom This option is used to specify the e-mail address of the sender of the e-mail.

To enable the specification of the sender address using job control, the placeholder '&EMLFR' can be used for this option. In this case PrintEx will use the 'MAILFROM' parameter from the OUTPUT CL statement to fill in the sender address at runtime.

mailto This option is used to specify the e-mail address of the receiver of the e-mail.

To enable the specification of the receiver address using job control, the placeholder '&EMLTO' can be used for this option. In this case PrintEx will use the 'MAILTO' parameter from the OUTPUT JCL statement to fill in the receiver address at runtime.

cc If the e-mail is to be sent to more than one receiver, the e-mail addresses of all receivers can be specified with this option (cc = carbon copy). Individual e-mail addresses are to be separated with semicolons.

To enable the specification of additional receiver addresses using job control, the placeholder '&EMLCC' can be used for this option. In this case PrintEx will use the 'MAILCC' parameter from the OUTPUT JCL statement to set the additional receiver address at runtime.

Subject This option is used to specify the subject of the e-mail.

To enable the specification of the e-mail's subject using job control, the placeholder '&TITLE' can be used for this option. In this case PrintEx will use the 'TITLE' parameter from the OUTPUT JCL statement to set the e-mail's subject at runtime.

Attachment filename This option is used to specify the file name for the PDF attachment.

In order to generate variable names, the following placeholders can be used:

&USERID	User name from JES spool file.
&JOBNAME	SYSOUT jobname from JES spool file.
&JOBID	SYSOUT job id from JES spool file.
&CLASS	SYSOUT class from JES spool file.
&FILE	Name from JES spool file.
&DEST	SYSOUT destination from JES spool file.
&WRITER	External writer name from JES spool file.

&FORM	Forms name from JES spool file.
&FCB	FCB name from JES spool file.
&DATE	Date of file generation (JES/VTAM).
&TIME	Time of file generation (JES/VTAM).
&VAPPL	Name of the originating VTAM application.
&ADDR#1	First field of the OUTPUT command 'ADDRESS'.
&ADDR#2	Second field of the OUTPUT command 'ADDRESS'.
&ADDR#3	Third field of the OUTPUT command 'ADDRESS'.
&ADDR#4	Fourth field of the OUTPUT command 'ADDRESS'.
&TITLE	Value of the OUTPUT statement 'TITLE'.
&UDATA	Value of the OUTPUT statement 'USERDATA'.

The following example shows how PrintEx generates a file name:

Specified file name: &JOBNAME_&FILE.pdf

Resulting file name: JOB0010_D0000101.SYSPRINT.pdf

If this option is not specified, PrintEx will generate the default file names '&FILE.pdf' for PDF files and '&FILE.txt' for text files.

Body

This option is used to specify the body text of the e-mail. The original data will be sent as a PDF attachment with the e-mail.

To enable the specification of the body text using job control, the placeholder '&UDATA' can be used for this option. In this case PrintEx will use the 'USERDATA' parameter from the OUTPUT JCL statement to include up to 60 characters as message body at runtime.

Sample JCL:

```
//SAMPLE   JOB …
//STEP1    EXEC PGM=PROG1
//OUTDS    OUTPUT CLASS=P,
//         MAILFROM='sender@xyz.com',
//         MAILTO='user1@xyz.com',
//         MAILCC='user2@xyz.com',
//         MAILCC='user3@xyz.com',
//         TITLE='e-mail from JES'
//         USERDATA='Up to 60 bytes of body text may be specified here'
//DD1      DD SYSOUT=(,),OUTPUT=(*.OUTDS)
```

Models

PrintEx uses so-called 'models' for the conversion of print data. Every destination must be connected with at least one model.

Models are used to define a number of options, e. g., the code page to be used for EBCDIC to ASCII translation, prefix data and suffix data to be inserted into the print data stream and transformation rules for control characters such as page feed, line feed, carriage return, back space and channel selection.

PrintEx comes with a number of predefined models for standard conversions like conversion of the print output to the PCL printer language, to PostScript and to Adobe PDF.

For each model the maximum width and the name of the model must be specified.

It is possible to assign as many as six models to a single destination. This makes it easier to use different models for output that varies only in the number of characters per line by specifying models that vary only in the used font size.

When the placeholder '&FCB' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select.

When the placeholder '&FCBFORM' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select. Additionally, the FORMS parameter of the JES spool file in work will be used to select an additional prefix data text. If any Forms prefix has been defined in the system parameters, this will be used as a prefix for the Forms value in order to generate the name of the additional prefix data text at runtime. Using two prefix data texts makes it possible to encapsulate static prefix data for every print out in one common prefix data text and to add variable prefix data through the Forms parameter if this should be desired.

Compression

Files sent as e-mail attachments can optionally be compressed and encrypted. Available options can be defined in a screen mask that's displayed after pressing the PF10-key in the e-mail destination maintenance screen as shown below:

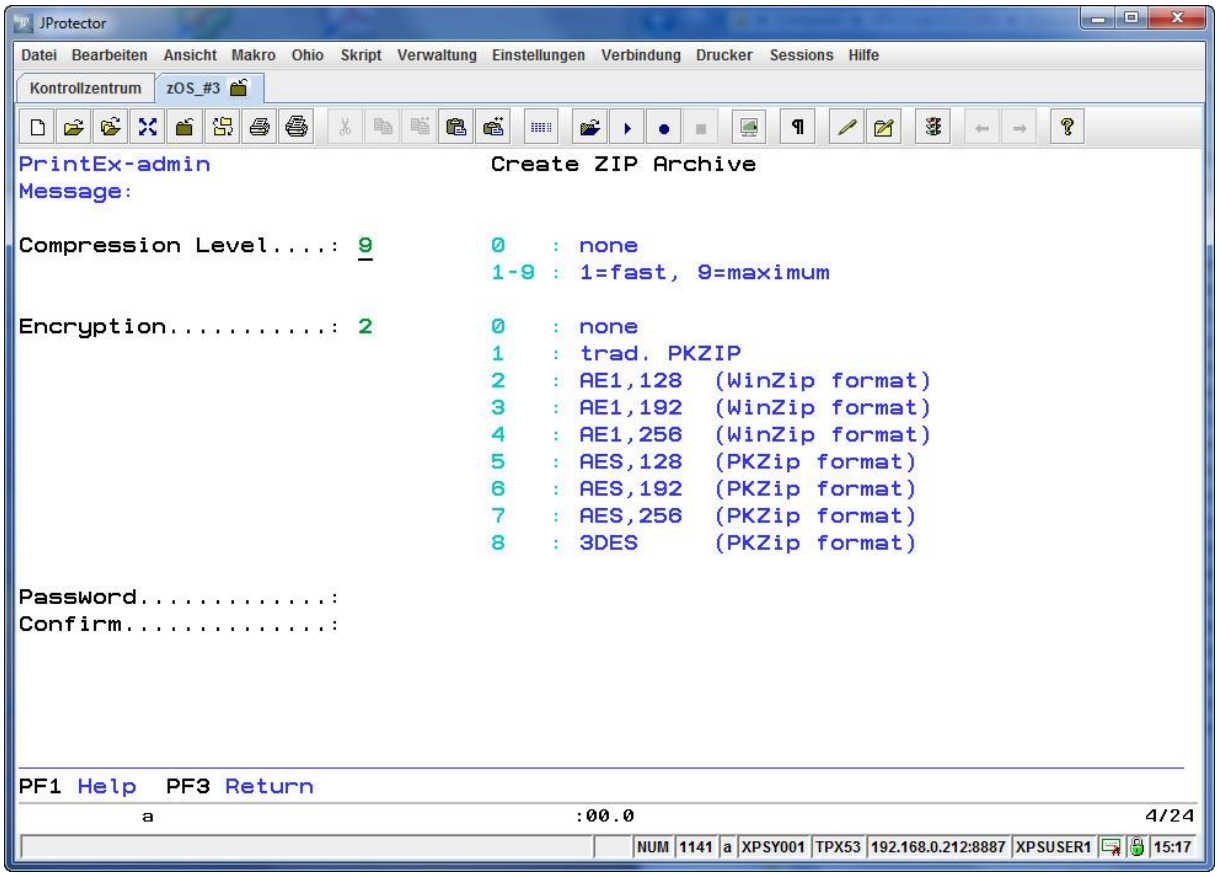


Fig. 19: Compression options for e-mail destination

Description of the input fields

Compression Level — Using this option the strength of the compression can be defined. The higher the chosen level the greater the amount of CPU used for compression and the smaller the resulting file. Choosing a compression level of '0' will result in no compression at all.

Encryption — Besides compression zip archives can also be password encrypted. If encryption is desired the encryption method to be used by PrintEx can be specified using this option. PrintEx supports strong encryption for the PKZIP and Winzip format.

Password — Using this option the password to be used by PrintEx for the encryption of the zip archive is to be specified. In order to open encrypted e-mail attachments the receiver of the e-mail needs to know the password used to encrypt the attachments. The input for this option is upper and lower case sensitive.

Confirm — For the purpose of confirmation the chosen password for encryption has to be entered again in this field.

Define a FTP destination

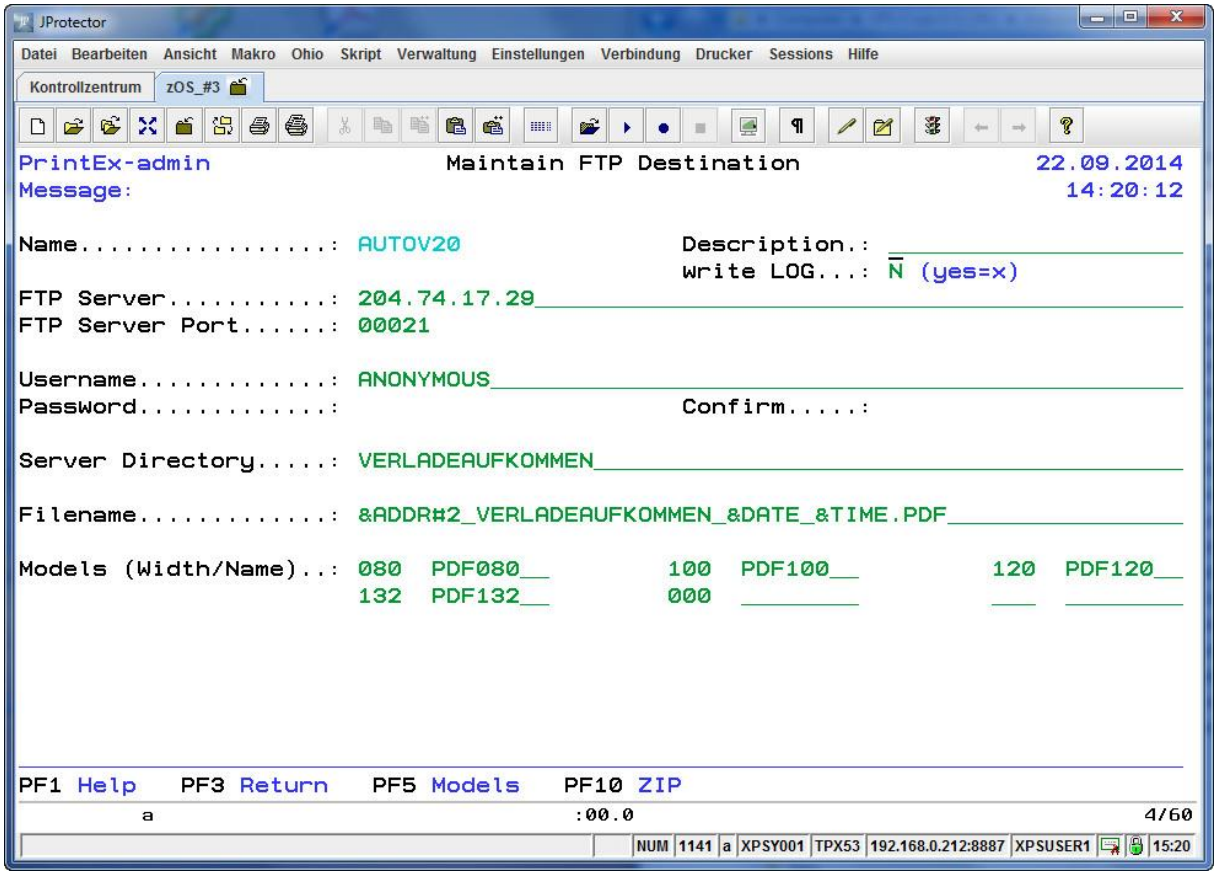


Fig. 20: Define a FTP destination

PrintEx can be used to send output from JES2/JES3 and from VTAM applications such as CICS or IMS to a FTP server using the FTP protocol. The format of the output data will be determined based on the selected model. For text files it is recommended to use a model like 'TXT132' and for PDF-files the models 'PDF080, PDF100, …' should be chosen.

New FTP destinations can be created using function 'A'. The screen mask previously displayed is used to define the destination data.

Description of the input fields

Name

This is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description

This field can be used for an optional description of the destination with up to 20 characters.

write LOG

If the option to write log entries has been globally deactivated in the system parameters, this can be activated individually for the destination by choosing 'X' for this option. If the option is set, PrintEx will write protocol entries if output will be sent to this destination.

FTP Server This is the TCP/IP address or the DNS name of the FTP server to which the output data is to be sent using the FTP protocol.

Username This option is used to specify the user name for the logon to the FTP server.

Password This option is used to specify the password for the logon to the FTP server.

Confirm For the purpose of confirmation of the password for the logon to the FTP server must be specified again.

Server Directory This option is used to specify the directory on the FTP server where the transmitted file is to be stored.

If '/ or no directory is specified, the file will be stored in the user's root directory on the server.

If, for example, '/TEST" is specified, the file will be stored in the subdirectory "TEST" of the user's root directory.

In order to generate variable directory names, the following placeholders can be used:

&USERID	User name from JES spool file.
&JOBNAME	SYSOUT jobname from JES spool file.
&JOBID	SYSOUT job id from JES spool file.
&CLASS	SYSOUT class from JES spool file.
&FILE	Name from JES spool file.
&DEST	SYSOUT destination from JES spool file.
&WRITER	External writer name from JES spool file.
&FORM	Forms name from JES spool file.
&FCB	FCB name from JES spool file.
&DATE	Date of file generation (JES/VTAM).
&TIME	Time of file generation (JES/VTAM).
&VAPPL	Name of the originating VTAM application.
&ADDR#1	First field of the OUTPUT command 'ADDRESS'.
&ADDR#2	Second field of the OUTPUT command 'ADDRESS'.
&ADDR#3	Third field of the OUTPUT command 'ADDRESS'.
&ADDR#4	Fourth field of the OUTPUT command 'ADDRESS'.
&TITLE	Value of the OUTPUT statement 'TITLE'.
&UDATA	Value of the OUTPUT statement 'USERDATA'.

Filename This option is used to specify the target file name.

In order to generate variable file names, the following placeholders can be used:

&USERID	User name from JES spool file.
&JOBNAME	SYSOUT jobname from JES spool file.
&JOBID	SYSOUT job id from JES spool file.
&CLASS	SYSOUT class from JES spool file.
&FILE	Name from JES spool file.
&DEST	SYSOUT destination from JES spool file.
&WRITER	External writer name from JES spool file.
&FORM	Forms name from JES spool file.
&FCB	FCB name from JES spool file.
&DATE	Date of file generation (JES/VTAM).

&TIME	Time of file generation (JES/VTAM).
&VAPPL	Name of the originating VTAM application.
&ADDR#1	First field of the OUTPUT command 'ADDRESS'.
&ADDR#2	Second field of the OUTPUT command 'ADDRESS'.
&ADDR#3	Third field of the OUTPUT command 'ADDRESS'.
&ADDR#4	Fourth field of the OUTPUT command 'ADDRESS'.
&TITLE	Value of the OUTPUT statement 'TITLE'.
&UDATA	Value of the OUTPUT statement 'USERDATA'.

The following example shows how PrintEx generates a file name:

Specified file name: &JOBNAME_&FILE.pdf

Resulting file name: JOB0010_D0000101.SYSPRINT.pdf

If this option is not specified, PrintEx will generate the default file names '&FILE.pdf' for PDF files and '&FILE.txt' for text files.

Models

PrintEx uses so-called 'models' for the conversion of print data. Every destination must be connected with at least one model.

Models are used to define a number of options, e. g., the code page to be used for EBCDIC to ASCII translation, prefix data and suffix data to be inserted into the print data stream and transformation rules for control characters such as page feed, line feed, carriage return, back space and channel selection.

PrintEx comes with a number of predefined models for standard conversions like conversion of the print output to the PCL printer language, to PostScript and to Adobe PDF.

For each model the maximum width and the name of the model must be specified.

It is possible to assign as many as six models to a single destination. This makes it easier to use different models for output that varies only in the number of characters per line by specifying models that vary only in the used font size.

When the placeholder '&FCB' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select.

When the placeholder '&FCBFORM' is used as model name, PrintEx will use the FCB name specified for a JES spool file to select the model at runtime. If any FCB prefix has been defined in the system parameters, this will be used as a prefix for the FCB name of the JES spool file in order to generate the name of the model to select. Additionally, the FORMS parameter of the JES spool file in work will be used to select an additional prefix data text. If any Forms prefix has been defined in the system parameters, this will be used as a prefix for the Forms value in order to generate the name of the additional prefix data text at runtime. Using two prefix data texts makes it possible to encapsulate static prefix data for every print out in one common prefix data text and to add variable prefix data through the Forms parameter if this should be desired.

Compression

Files sent via FTP can optionally be compressed and encrypted. Available options can be defined in a screen mask that's displayed after pressing the PF10-key in the FTP destination maintenance screen as shown below:

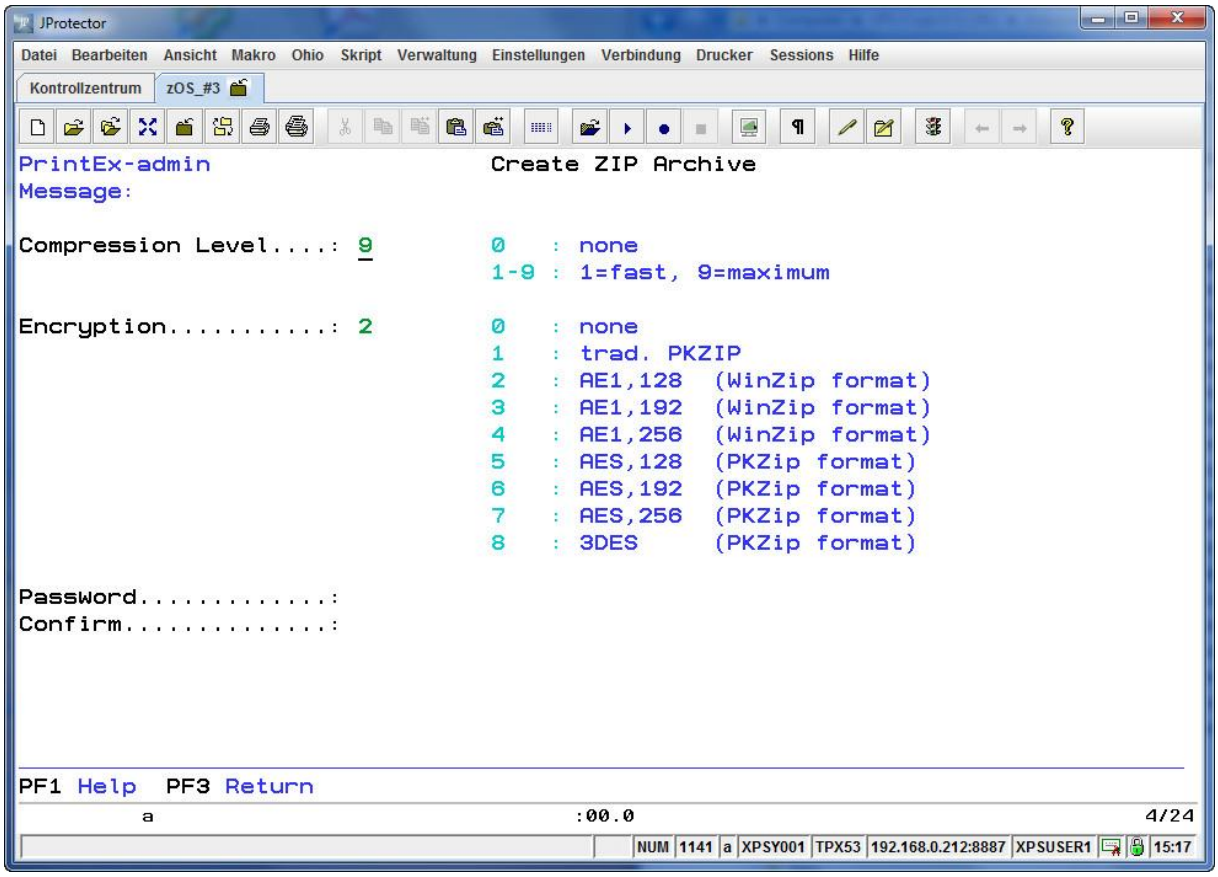


Fig. 21: Compression options for FTP destination

Description of the input fields

Compression Level — Using this option the strength of the compression can be defined. The higher the chosen level the greater the amount of CPU used for compression and the smaller the resulting file. Choosing a compression level of '0' will result in no compression at all.

Encryption — Besides compression zip archives can also be password encrypted. If encryption is desired the encryption method to be used by PrintEx can be specified using this option. PrintEx supports strong encryption for the PKZIP and Winzip format.

Password — Using this option the password to be used by PrintEx for the encryption of the zip archive is to be specified. In order to open encrypted files the specified password must be known. The input for this option is upper and lower case sensitive.

Confirm — For the purpose of confirmation the chosen password for encryption has to be entered again in this field.

Define a file destination

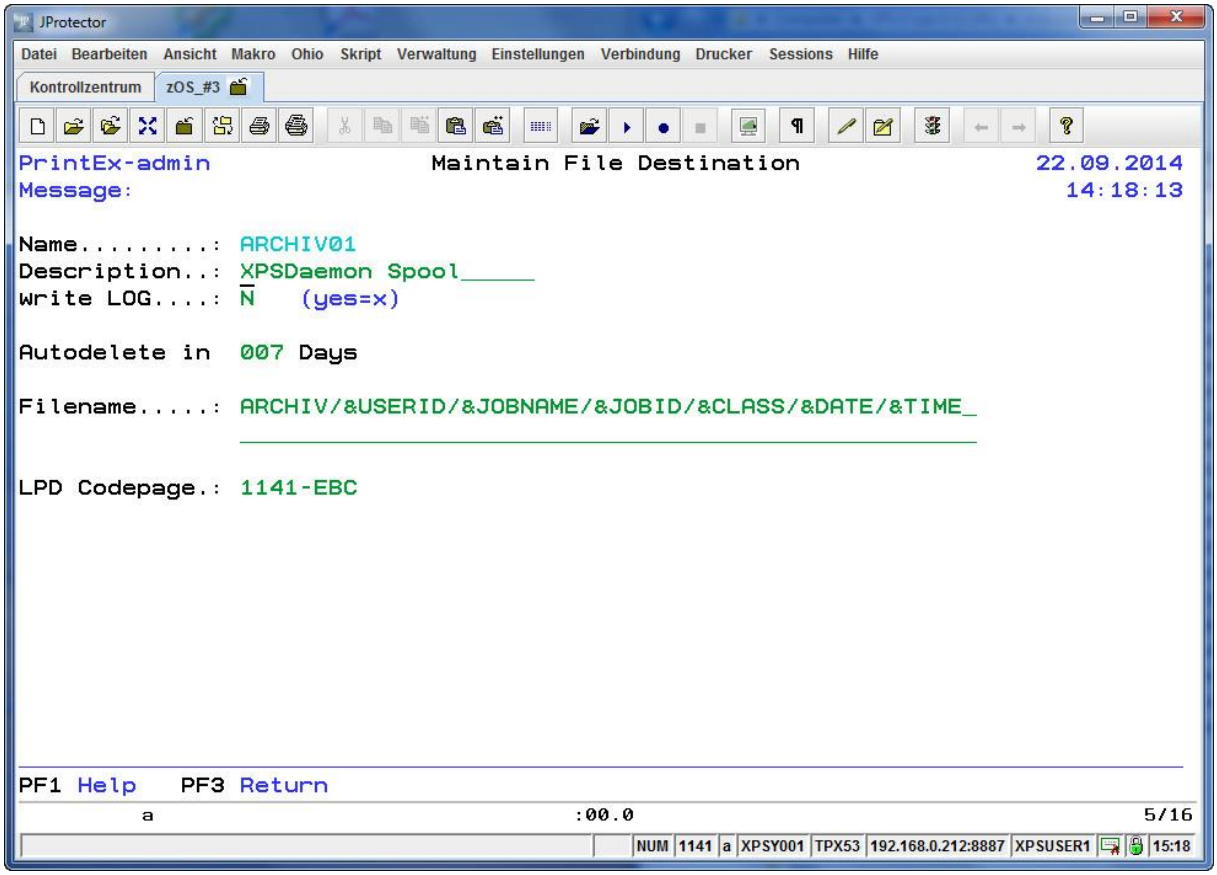


Fig. 22: Define a file destination

PrintEx can be used to archive output from JES2/JES3 and from VTAM applications such as CICS or IMS in an own hierarchical file system.

New file destinations can be created using function 'A'. The screen mask previously displayed is used to define the destination data.

Description of the input fields

Name — This is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description — This field can be used for an optional description of the destination with up to 20 characters.

write LOG — If the option to write log entries has been globally deactivated in the system parameters, this can be activated individually for the destination by choosing 'X' for this option. If the option is set, PrintEx will write protocol entries if output will be sent to this destination.

Autodelete in .. Days — This option can be used to specify after how many days' files shall automatically be deleted from the hierarchical file system.

Filename

This option is used to specify the target file name on the hierarchical file system. The file name can be up to 128 characters long.

Subdirectories can be created by inserting the slash character ('/').

In order to generate variable file names, the following placeholders can be used:

&USERID	User name from JES spool file.
&JOBNAME	SYSOUT jobname from JES spool file.
&JOBID	SYSOUT job id from JES spool file.
&CLASS	SYSOUT class from JES spool file.
&FILE	Name from JES spool file.
&DEST	SYSOUT destination from JES spool file.
&WRITER	External writer name from JES spool file.
&FORM	Forms name from JES spool file.
&FCB	FCB name from JES spool file.
&DATE	Date of file generation (JES/VTAM).
&TIME	Time of file generation (JES/VTAM).
&VAPPL	Name of the originating VTAM application.
&ADDR#1	First field of the OUTPUT command 'ADDRESS'.
&ADDR#2	Second field of the OUTPUT command 'ADDRESS'.
&ADDR#3	Third field of the OUTPUT command 'ADDRESS'.
&ADDR#4	Fourth field of the OUTPUT command 'ADDRESS'.
&TITLE	Value of the OUTPUT statement 'TITLE'.
&UDATA	Value of the OUTPUT statement 'USERDATA'.

The following example shows how PrintEx generates a file name:

Specified file name:

&USERID/&CLASS/&JOBNAME/&JOBID/&DATE/&FILE

Resulting file name:

XPSSYST/A/JOB0010/STC05998/040901/D0000101.SYSPRINT

If this option is not specified, PrintEx will generate the default file names '&FILE.pdf' for PDF files and '&FILE.txt' for text files.

LPD Codepage

If PrintEx will receive external data via the LPD daemon (port 515), the incoming data must be translated to EBCDIC. PrintEx will use the codepage specified with this option to do so.

Define a RAW destination

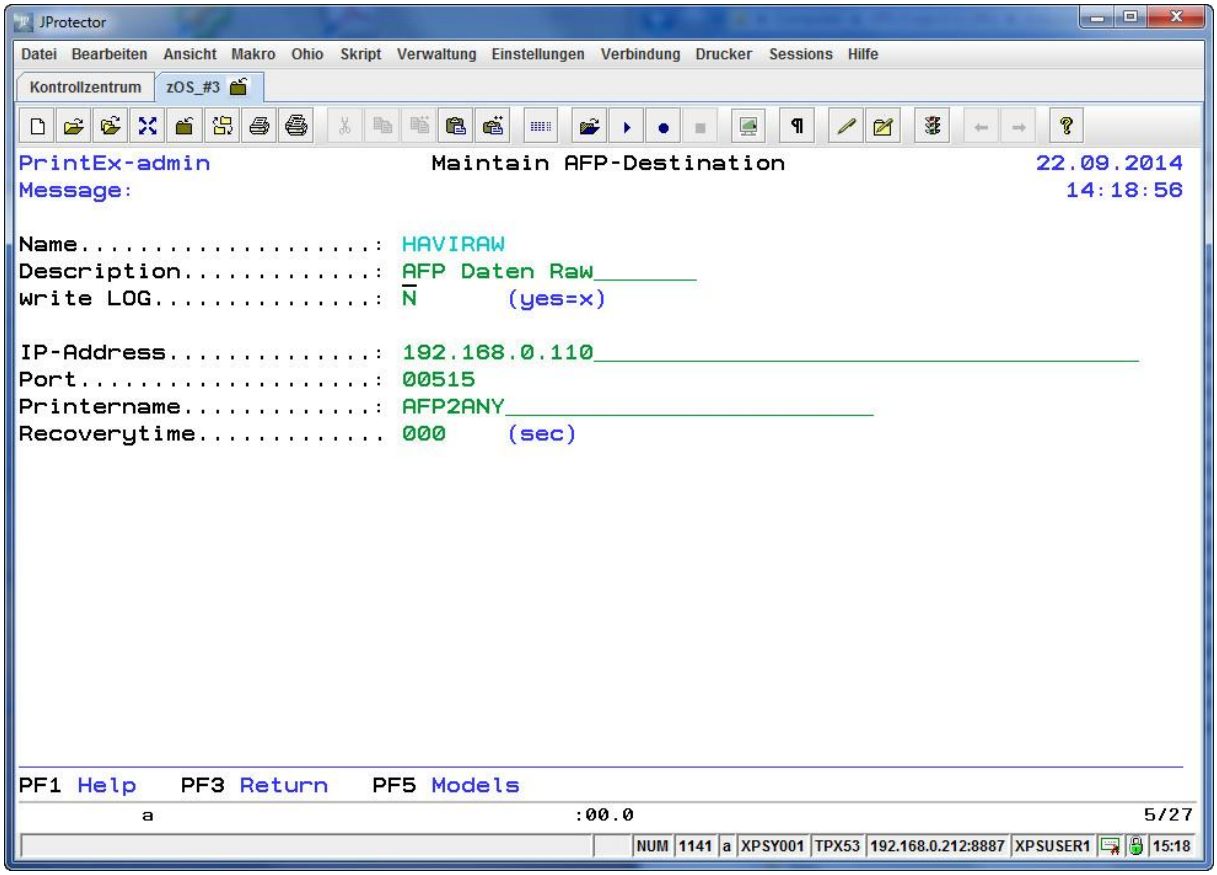


Fig. 23: Define a RAW destination

Using a destination of the type 'RAW', data can be sent binary without any conversion to the defined target. PrintEx will send the data to the specified TCP/IP target using the LPD protocol.

New raw destinations can be created using function 'A'. The screen mask previously displayed is used to define the destination data.

Description of the input fields

Name — This is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description — This field can be used for an optional description of the destination with up to 20 characters.

write LOG — If the option to write log entries has been globally deactivated in the system parameters, this can be activated individually for the destination by choosing 'X' for this option. If the option is set, PrintEx will write protocol entries if output will be sent to this destination.

IP-Address — This option is used to specify the target's TCP/IP address or DNS name respectively.

Port — This option is used to specify the target's port.

Printername This option is used to specify the LPD Queuename to be transmitted.

Recoverytime This option can be used to specify a time interval in seconds that PrintEx shall wait until the next attempt if the connection establishment with the TCP/IP address has failed.

If the next attempt to establish a connection with the TCP/IP target fails, PrintEx uses the value of the system parameter 'Print Restart Interval' for subsequent attempts to establish the connection.

Pool Definitions

As alternative to the definition of specific destinations, PrintEx allows the use of pools of destinations. In this case, the first free destination is chosen from the pool of destinations. It is possible to group up to 120 similar destinations in one pool.

Choosing the menu option '4 Pool Definitions' will lead to the screen mask shown below.

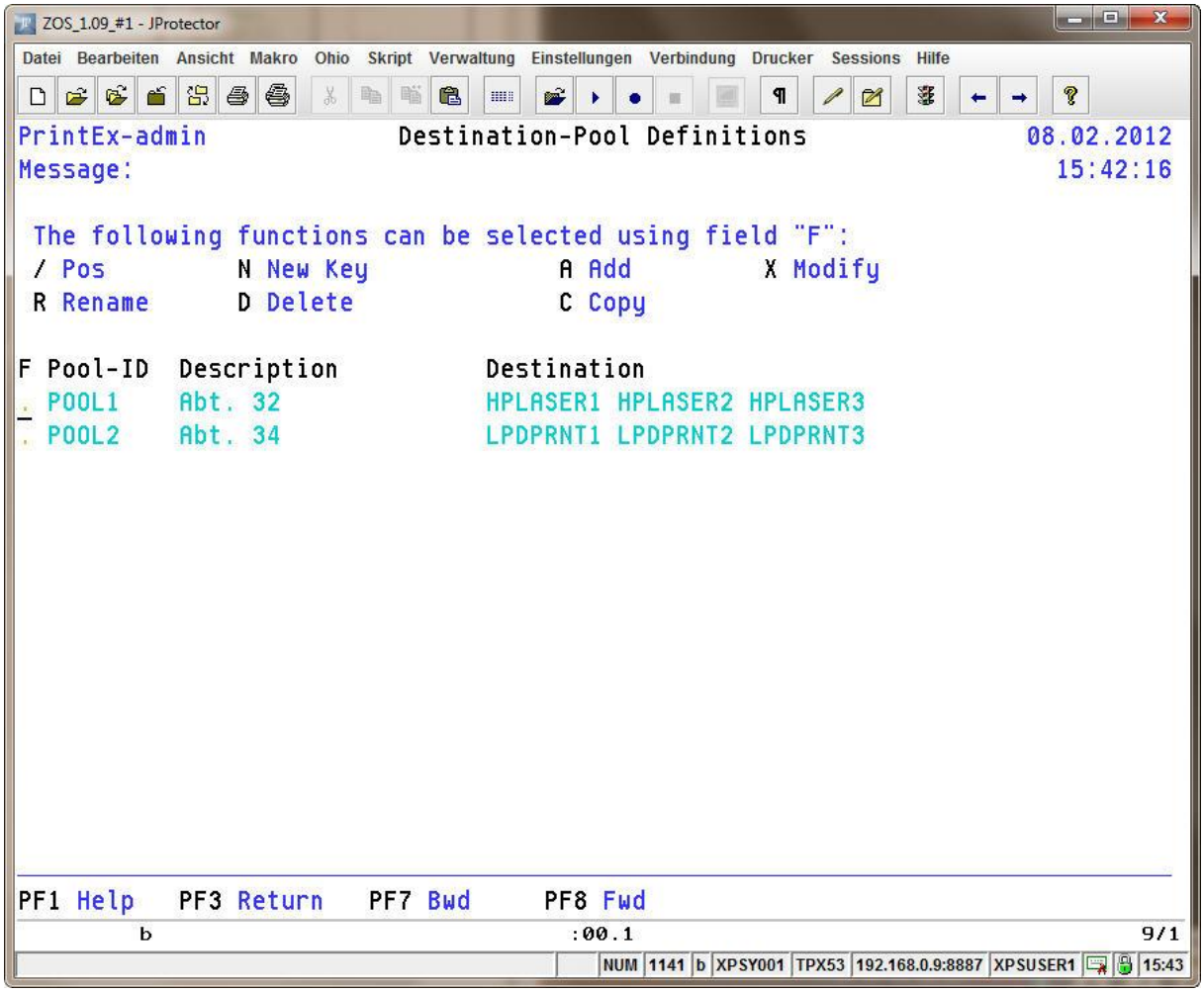


Fig. 24: Pool Definitions

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

Description of the fields

F	Choice box for one of the functions listed in the screen mask header.
Pool-ID	Name of the pool (max. 8 characters long).
Description	Up to 20 characters description of the pool.
Destination	Listing of the first 5 destinations defined in the pool.

Function selection

Field 'F' can be used to choose one of the functions listed in the screen mask header.

/	**Pos**

The display will be rearranged moving the selected entry to the top of the list.

N	**New Key**

Using this function a new entry can be selected to be moved to the top of the list.

To achieve this, a window for the input of the new start position is displayed. The input will be processed as a generic name. That is, the first entry found greater or equal to the input name will become the first entry in the list.

R	**Rename**

The selected entry can be renamed using function 'R'.

For the purpose of documentation the current name of the entry will be displayed in the entry mask where the new entry name can be specified. The chosen entry will only be renamed if the newly specified name is unique.

The length of the name of a pool name may not exceed 8 characters.

D	**Delete**

The selected pool definition can be deleted using function 'D'.

After confirmation by pressing the Enter key the selected entry will be deleted from the index of the pool definitions. For the purpose of documentation the name of the entry about to be deleted will be displayed in the window asking for the delete confirmation.

All other functions for maintenance of the destination pools use the following screen mask:

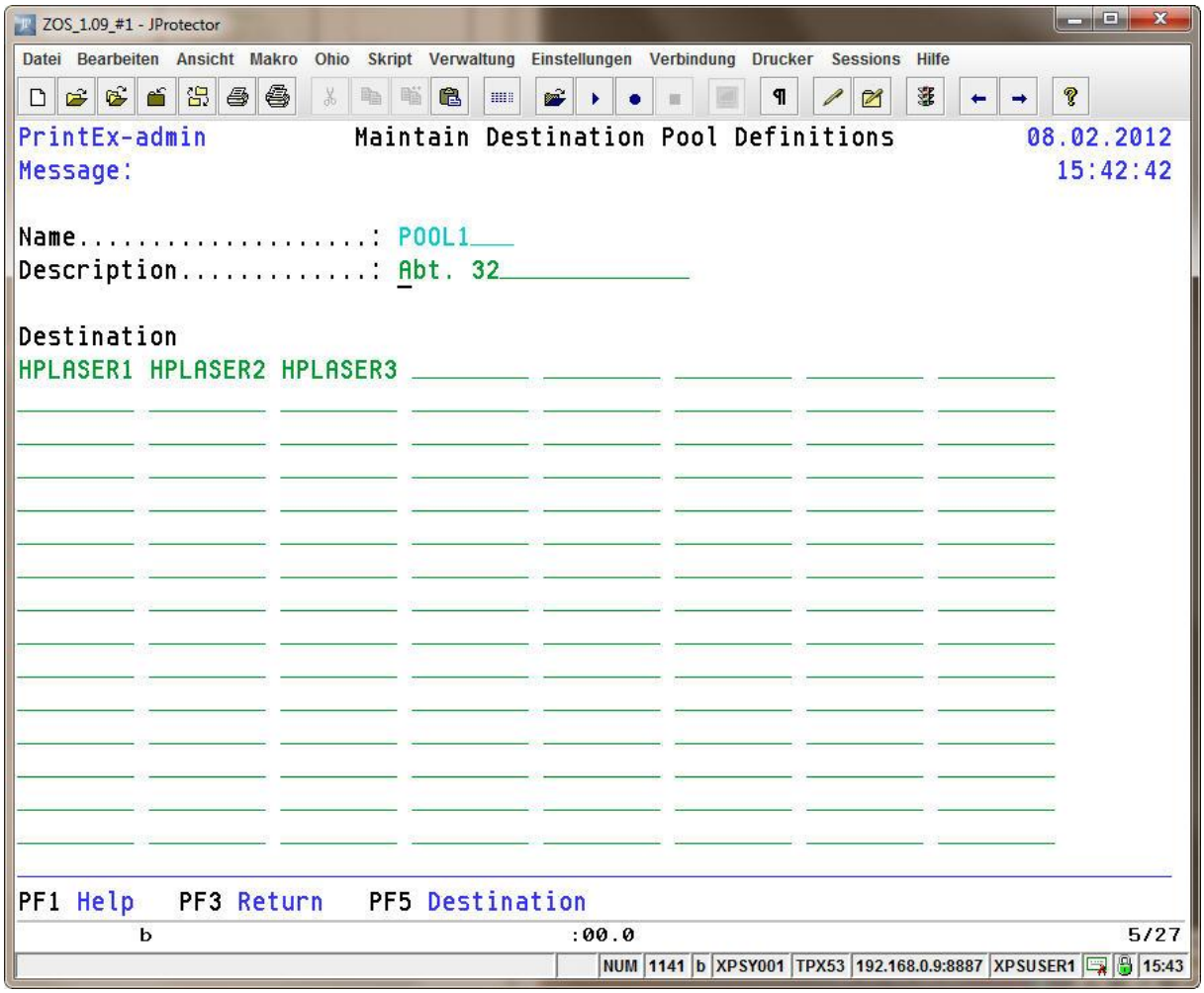


Fig. 25: Create, change and copy destination pool entries

Function key assignments

PF1 Display the online help.

PF3 Return to the index of destination pools.

PF5 Display an overview of the available destinations.

Description of the fields

Name This is the key for the new destination pool definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description This field can be used for an optional description of the destination pool with up to 20 characters.

Destination This table can be used to define up to 120 similar destinations. If output is available for the pool of printers, PrintEx will search for the first free printer in the pool and will send the data to print to the found destination.

Function selection

X	Modify

Existing pool definitions can be modified using function 'X'. Selecting this function will display the input screen mask shown above.

The screen mask will contain the definitions previously made for the pool which can be modified by overwriting them.

C	Copy

An existing pool definition can be copied using function 'C'.

Model Definitions

PrintEx uses so-called 'models' for the conversion of print data. Every destination must be connected with at least one model.

Models are used to define a number of options, e. g., the code page to be used for EBCDIC to ASCII translation, prefix data and suffix data to be inserted into the print data stream and transformation rules for control characters such as page feed, line feed, carriage return, back space and channel selection.

PrintEx comes with a number of predefined models for standard conversions like conversion of the print output to the PCL printer language, to PostScript and to Adobe PDF.

Choosing the menu option '5 Model Definitions' will lead to the screen mask shown below.

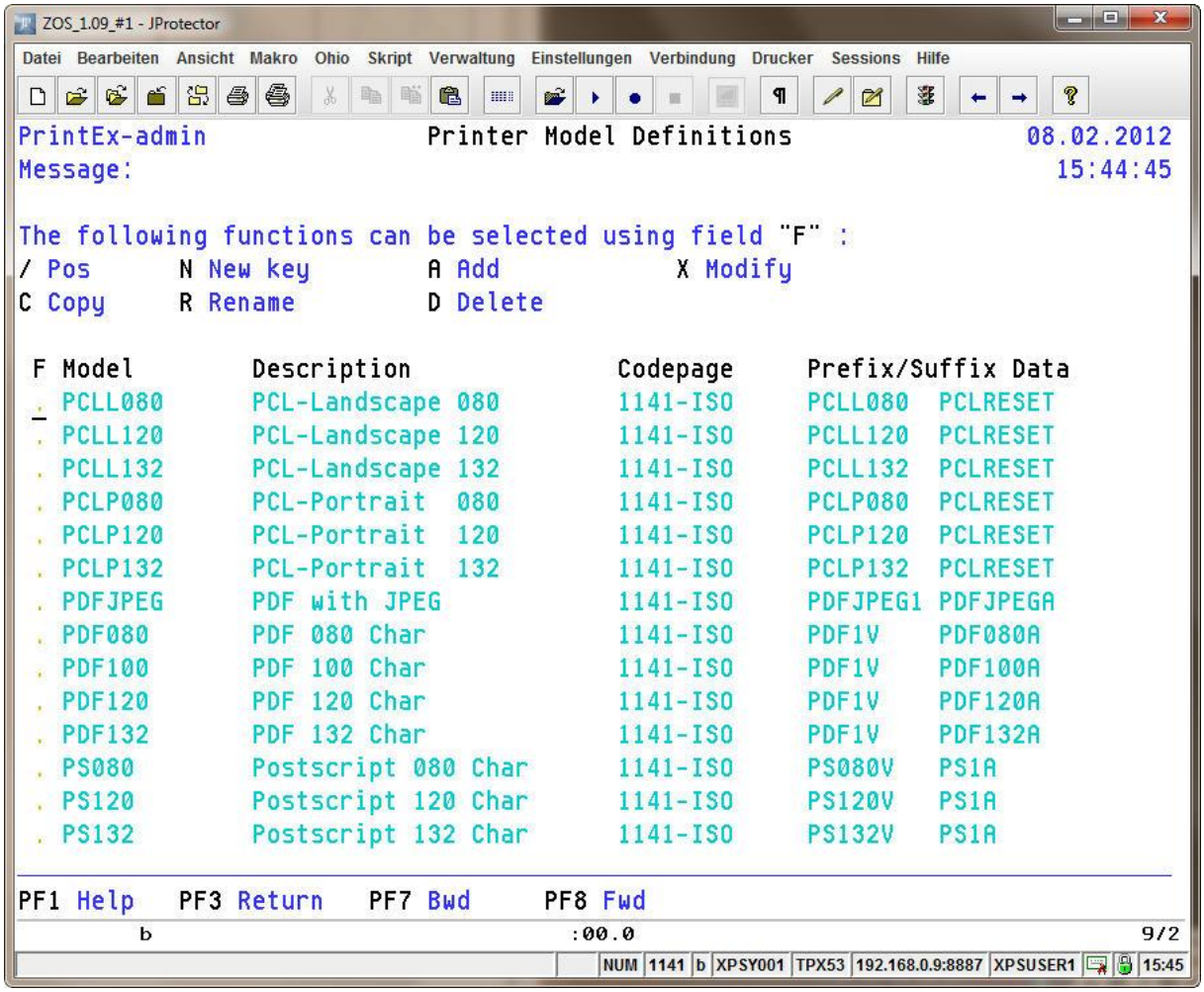


Fig. 26: Model Definitions

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

Description of the fields

F Choice box for one of the functions listed in the screen mask header.

Model Name of the model (max. 8 characters long).

Description This field can be used for an optional description of the model with up to 20 characters.

Codepage The code page to be used with this model.

Prefix/Suffix Data The prefix data and the suffix data to be used with this model.

Function selection

Field 'F' can be used to choose one of the functions listed in the screen mask header.

/	Pos

The display will be rearranged moving the selected entry to the top of the list.

N	New Key

Using this function a new entry can be selected to be moved to the top of the list.

To achieve this, a window for the input of the new start position is displayed. The input will be processed as a generic name. That is, the first entry found greater or equal to the input name will become the first entry in the list.

R	Rename

The selected entry can be renamed using function 'R'.

For the purpose of documentation the current name of the entry will be displayed in the entry mask where the new entry name can be specified. The chosen entry will only be renamed if the newly specified name is unique.

The length of the name of a model name may not exceed 8 characters.

D	Delete

The selected model definition can be deleted using function 'D'.

After confirmation by pressing the Enter key the selected entry will be deleted from the index of the pool definitions. For the purpose of documentation the name of the entry about to be deleted will be displayed in the window asking for the delete confirmation.

All other functions for maintenance of the model definitions use the following screen mask:

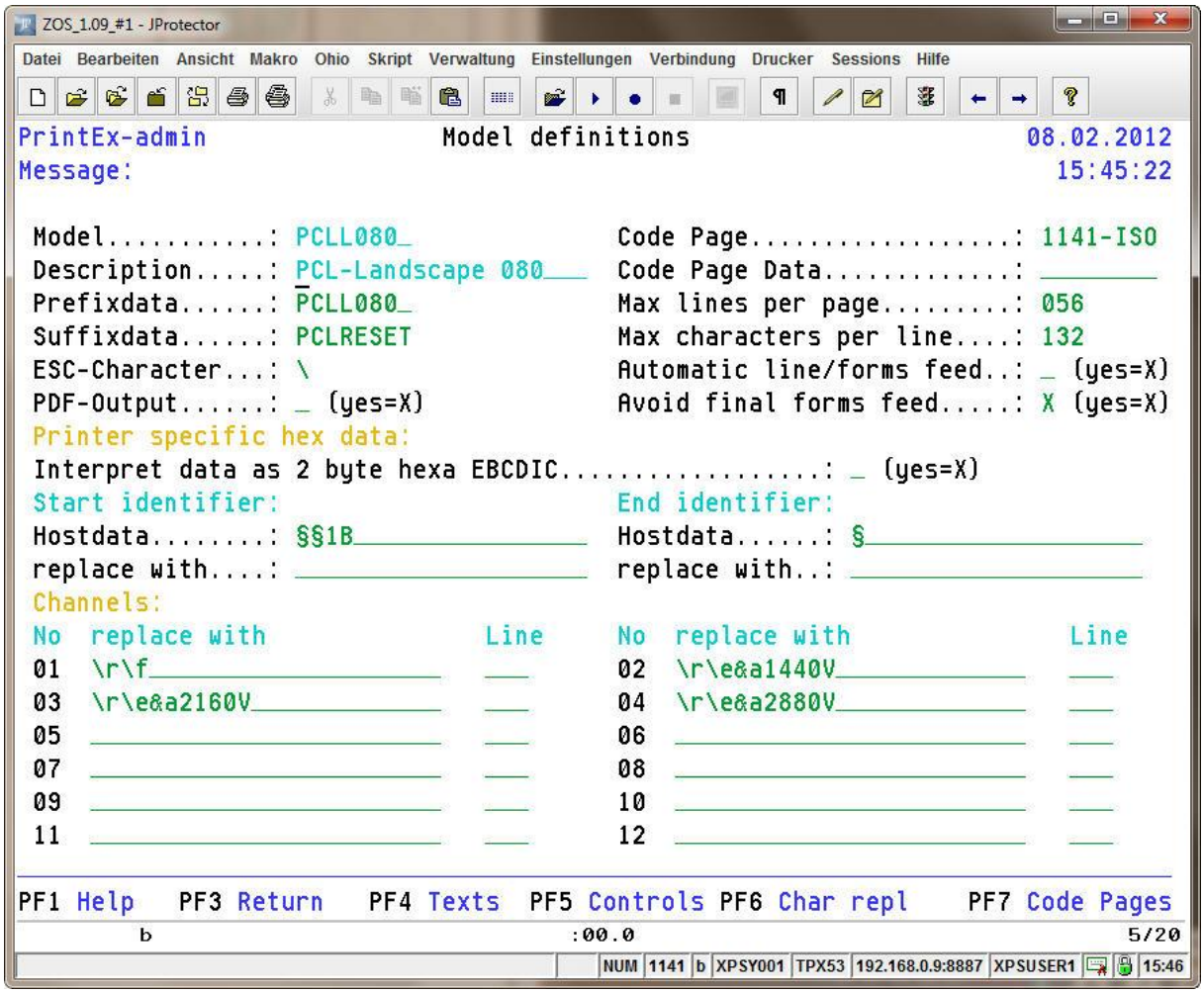


Fig. 27: Create, change and copy models

Function key assignments

PF1 Display the online help.

PF3 Return to the index of the model definitions.

PF4 Display an overview of the available texts.

PF5 Maintain control characters.

PF6 Maintain character replacements.

PF7 Display an overview of the available code pages.

Description of the fields

Model This is the key for the new model definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

Description This field can be used for an optional description of the destination with up to 20 characters.

Prefixdata This field can be used to define a text containing prefix data. The text can contain a sequence of data to be sent to the printer before the actual print data will be sent. Using this mechanism makes it easy, e. g., to externally activate a specific character set for the following print data.

During PrintEx installation a number of prefix data texts will be copied. These contain format specific examples for PCL, PostScript and Adobe-PDF.

Suffixdata This field can be used to define a text containing suffix data. The text can contain a sequence of data to be sent to the printer after the actual print data has been sent. Using this mechanism makes it easy, e. g., to automatically reset the printer after the print job has finished.

If the model is used to convert data to Adobe-PDF, the suffix data will contain presentation related information such as font selection and line and character pitch.

During PrintEx installation a number of suffix data texts will be copied. These contain format specific examples for PCL, PostScript and Adobe-PDF.

ESC-Character This field can be used to define the character to be interpreted as 'escape character'. Using a combination of the escape character and of an identification character, printer control characters can be inserted into the prefix and suffix data texts as well as into the definitions of the printer control characters. The backslash '\' is the standard escape character. The following control characters can be used:

\n – new line

\r – carriage return

\b – back space

\e – escape

\f – forms feed.

PDF-Output If 'X' is specified for this option, print data will be added as PDF attachment for e-mail destinations. Otherwise text attachmemts will be used.

Code Page This field can be use to specify a code page to be used for the translation of control information and print data from EBCDIC to ASCII/OEM/ANSI. Pressing the PF7 key will display an overview of the available code pages.

Code Page Data If it is necessary to translate the actual print data with another code page than the one that is used to translate control information from EBCDIC to ASCII/OEM/ANSI (see preceding field 'Code Page'), the code page to be used for data translation can be defined in this field. Pressing the PF7 key will display an overview of the available code pages.

Max lines per page If the following option 'Automatic line/forms feed' is selected this field can be used to let PrintEx automatically insert a forms feed after the number of lines specified in this field has been printed.

Max characters per line If the following option 'Automatic line/forms feed' is selected this field can be used to let PrintEx automatically insert a line feed after the number of characters specified in this field has been printed.

Automatic line/forms feed If PrintEx is to insert automatic forms and line feeds as specified with the two preceding options this option has to be set to X'.

Avoid final forms feed If an 'X' is specified for this option PrintEx will not cause an automatic forms feed after the printout data has been sent completely.

Printer specific hex data Print data generated by host programs can contain special data streams for the purpose of printer control. Formerly these printer control data streams have been detected by hardware boxes and have been converted into the corresponding hexadecimal representation. The beginning and the end of these sequences have to be indicated using special eye-catchers.

The next fields from the dialog can be used to define how PrintEx can detect these special printer control data streams. In doing so, the start and the end identifier and an optional replacement sequence have to be defined.

Interpret data as 2 byte hexa EBCDIC In order to activate the previously described replacement processing, this option has to be selected ('X'). PrintEx will then interpret all data between the 'Start identifier' and the 'End identifier' as 2 byte hexadecimal ASCII representation which will be sent unchanged to the printer after translating the single characters from EBCDIC to ASCII. If, e. g., the ASCII character '1' – ASCII hex code 0x31 – is to be sent to the printer, the character sequence '31' has to be defined.

Start identifier This field is used to define the start identifier.

End identifier This field is used to define the end identifier.

replace with If the start or the end identifier is to be replaced with other character sequences, the replacement sequences can be specified using these fields. If no replacement is defined, the particular identifier will be removed from the print data stream.

Channels The JES spool protocol and the SCS printer protocol support line feeds to specific channels. In order to emulate this behavior it is possible to define printer commands to be executed by PrintEx if line feeds to specific channels are detected in the print data stream.

Additionally, it is possible to define a constant line number to be used when a feed to the channel is deteted. PrintEx will then position the print cursor to the defined line and the internal line counter for the automatic forms feed will be set to this value. If no line number is defined, PrintEx will set the internal line counter to zero.

The second model definition page contains the control characters. This input mask can be used to define replacement strings for specific printer control characters. PrintEx will carry out the actual replacements in the print datastream immediately before data is sent to the printer.

Pressing the PF5 key from the model definitions page will lead to the screen mask shown below.

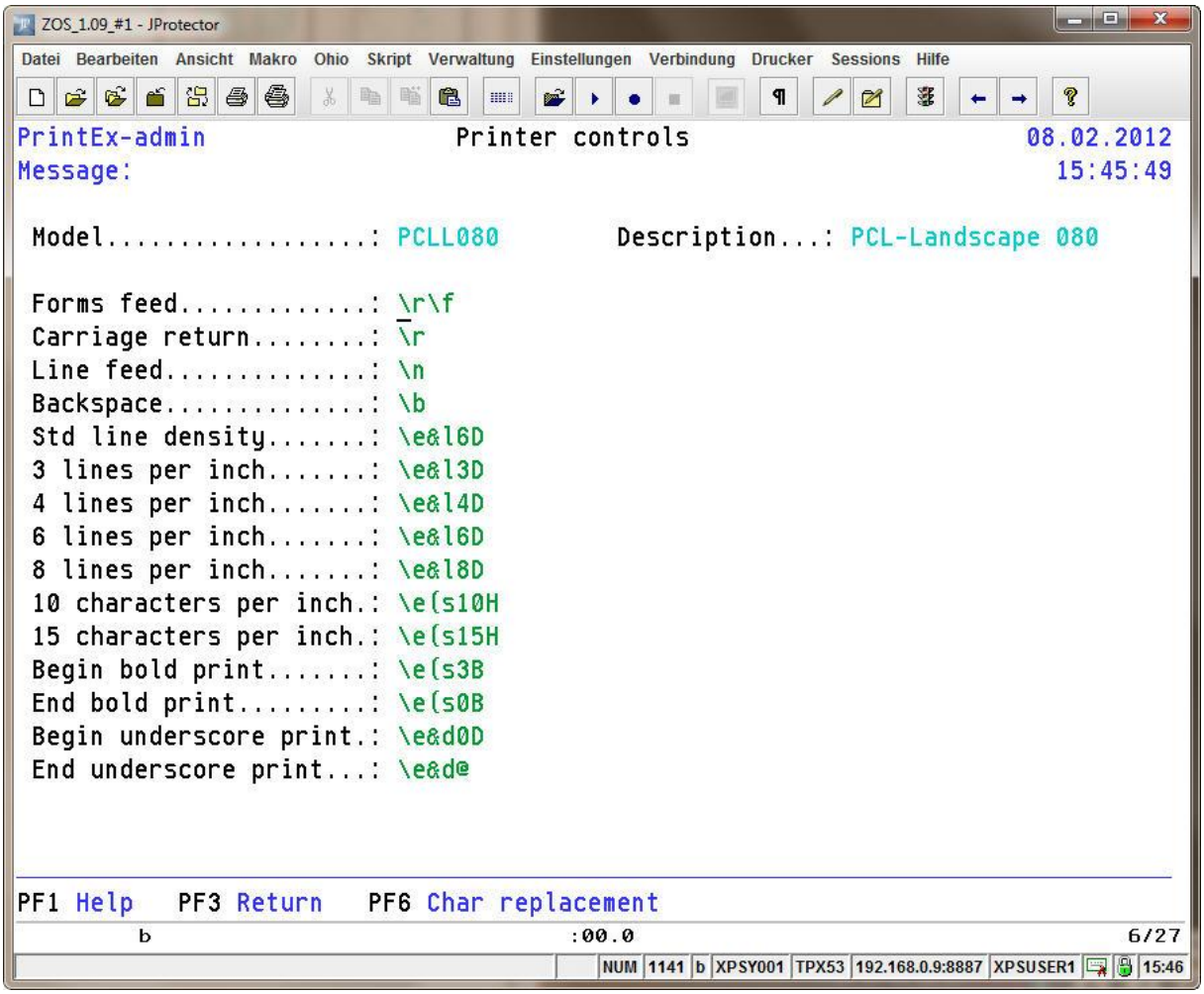


Fig. 28: Printer controls for model entries

Function key assignments

PF1 Display the online help.

PF3 Return to the model definition.

PF6 Maintain character replacements.

Description of the fields

Forms feed This field is used to define a replacement sequence for a forms feed in a particular printer language (PCL, PostScript). If an Adobe PDF is created, the replacement data will be inserted at the start of every page which makes it possible to insert forms data.

Carriage return This field is used to define a replacement sequence for a carriage return in a particular printer language (PCL, PostScript). This field will be ignored if an Adobe PDF is created.

Line feed This field is used to define a replacement sequence for a line feed in a particular printer language (PCL, PostScript). This field will be ignored if an Adobe PDF is created.

Backspace This field is used to define a replacement sequence for a back space in a particular printer language (PCL, PostScript). This fill will be ignored if an Adobe PDF is created.

Std line density This field can be used to define a replacement sequence for the SCS command 'SLD - Set Line Density' to set the standard line density.

3 lines per inch This field can be used to define a replacement sequence for the SCS command 'SLD - Set Line Density' to set the density to 3 lines per inch.

4 lines per inch This field can be used to define a replacement sequence for the SCS command 'SLD - Set Line Density' to set the density to 4 lines per inch.

6 lines per inch This field can be used to define a replacement sequence for the SCS command 'SLD - Set Line Density' to set the density to 6 lines per inch.

8 lines per inch This field can be used to define a replacement sequence for the SCS command 'SLD - Set Line Density' to set the density to 8 lines per inch.

10 characters per inch This field can be used to define a replacement sequence for the SCS command 'SLD - Set Character Density' to set the density to 10 characters per inch.

15 characters per inch This field can be used to define a replacement sequence for the SCS command 'SLD - Set Character Density' to set the density to 15 characters per inch.

Begin bold print This field can be used to define a replacement sequence for the command 'Begin bold print'.

End bold print This field can be used to define a replacement sequence for the command 'End bold print'.

Begin underscore print This field can be used to define a replacement sequence for the command 'Begin underscore print'.

End underscore print This field can be used to define a replacement sequence for the command 'End underscore print'.

The third model definition page contains the character replacement. This input mask can be used to define replacement strings for specific character sequences. PrintEx will carry out the actual replacements in the print datastream immediately before data will be sent to the printer.

Pressing the PF6 key from the model definitions page or from the Printer controls page will lead to the screen mask shown below.

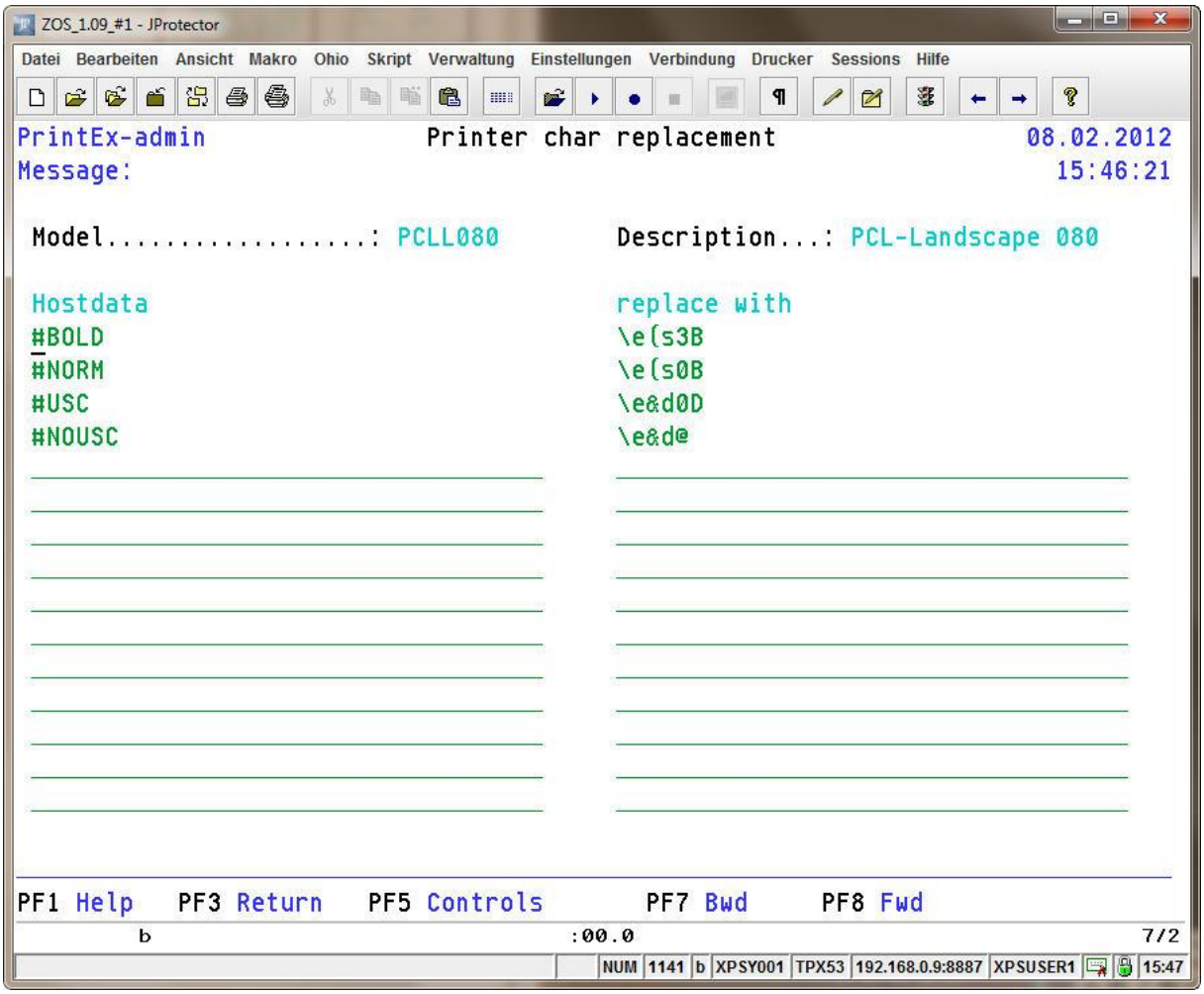


Fig. 29: Character replacements for model entries

Function key assignments

PF1 Display the online help.

PF3 Return to the index of the model definitions.

PF5 Maintain control characters.

PF7 Scroll one page backward. The display will remain unchanged if the beginning is reached.

PF8 Scroll one page forward. The display will remain unchanged if the end of the index is reached.

Description of the fields

Hostdata This field is used to define the string in the printer data stream generated on the host that is to be replaced.

replace with This field is used to define the replacement for the associated host data string.

Function selection

X	Modify

Existing model entries can be modified using function 'X'. Selecting this function will display the input screen mask shown in Fig. 27 on page 68.

The screen mask will contain the definitions previously made for the model which can be modified by overwriting them.

C	Copy

An existing model definition can be copied using function 'C'.

Sample model definitions for PCL output

The following table shows example values for the various fields of a model definition for printout on a PCL printer. Control characters as well as hexadecimal or binary input requires the use of escape characters. These are described in chapter 'ESCAPE characters in model definitions' on page 88. PCL commands are to be obtained from the description of the PCL language for the used printer.

Screen mask: Model definitions See Fig. 27 on page 68	Description / Meaning
`Prefixdata......: textname`	The name of the text containing the prefix data. The content of this document will be inserted at the beginning of the print data. The text must contain the PCL commands needed to set up the printer.

`Content of prefix data text:`
`\e(s3T`
`\e(s0P`
`\e(s12H`
`\e(s8V`
`\e(s0S`
`\e(s0B`
`\e&&l1O`
`\e&&6D`
`\e(0N`
	Typeface: Courier
	Spacing: fixed
	Pitch in Chars / inch
	Height in points
	Style: solid/upright
	Stroke weight 0 (-7 to +7)
	Page Orientation: Landscape
	Line spacing: 6 lines per inch
	Symbol Set: ECMA-94 Latin 1

`Suffixdata......: textname`	The name of the text containing the suffix data. The content of this document will be inserted at the end of the print data.
`Content of suffix data text:` `\eE`	Reset.
`ESC-Character...: \`	The escape character that will be used in combination with another character to insert printer control characters and binary data into the data stream.
`Automatic line/forms feed..: X`	Activate automatic forms and line feed respectively. If the defined maximum number of lines is reached, a forms feed will be automatically included. If the defined maximum number of characters per line is reached, a line feed will be automatically included.
`Max lines per page.....: 072`	Automatic forms feed after 72 printed lines.
`Max characters per line....: 132`	Automatic line feed after 132 printed characters.
`Printer specific hex data:` `Interpret data as 2 byte hexa EBCDIC(yes=X): X`	If this option is specified with an 'X' the hexadecimal print data will be converted from a 2 byte character code into a 1 byte hexadecimal representation. Otherwise the hexadecimal data will be printed as is.

Start identifier: Hostdata.....: §§1B replace with....: \x1B	Indicator for the beginning of hexadecimal data. Hexadecimal characters to be insered before the hexadecimal print data.
End identifier: Hostdata.....: § replace with..:	Indicator for the end of hexadecimal data. Hexadecimal characters to be insered after the hexadecimal print data.
Channels: Nr replace with Line 01 \r\e&&a720V 10	Nr - channel number replace with - PCL command to indicate the desired vertical position. Line – Logical line number correlating with the defined channel feed. If no replacement is given blank lines will be inserted until the specified line number is reached. The internal line counter for the automatic page feed will be set to 10. The current print position will be set to a distance of 720 * 1/72 inch from the upper edge which is equal to print line 10.
02 \r\e&&a1440V 20	The current print position will be set to a distance of 1440 * 1/72 inch from the upper edge which is equal to print line 20.
03 \r\e&&a2160V 30	The current print position will be set to a distance of 2160 * 1/72 inch from the upper edge which is equal to print line 30.
04 \r\e&&a2880V 40	The current print position will be set to a distance of 2880 * 1/72 inch from the upper edge which is equal to print line 40.

Screen mask: Printer controls **See Fig. 28 on page 71**	**Define the replacements to be printed instead of the particular printer or JES commands.**
Forms feed.....: \f	Output for FORMSFEED (0x0C).
Carriage return.....: \r	Output for CARRIAGE RETURN (0x0D).
Line feed.....: \n	Output for LINE FEED (0x0A).
Backspace.....: \b	Output for BACK SPACE (0x16).
Std line density.....: \e&&l6D	Set default line density to 6 lines per inch.
3 lines per inch.....: \e&&l3D	Set line density to 3 lines per inch.
4 lines per inch.....: \e&&l4D	Set line density to 4 lines per inch.
6 lines per inch.....: \e&&l6D	Set line density to 6 lines per inch.
8 lines per inch.....: \e&&l8D	Set line density to 8 lines per inch.
10 characters per inch.: \e(s10H	Set character density to 10 characters per inch.
15 characters per inch.: \e(s15H	Set character density to 15 characters per inch.
Begin bold print.....: \e(s3B	Set character print width to 3 (possible: -7 to 7).
End bold print.....: \e(s0B	Set character print width to 0 (normal).
Begin underscore print.: \e&d0D	Print with underscores.
End underscore print...: \e&d@	Print without underscores.

Screen mask: Printer char replacement **See Fig. 29 on page 73**	**Define common replacements for print data.**
Hostdata replace with §1B \x1B !!!!!! !\x010101\x! <->	Replace characters '1B' with hex 1B (ESC). Remove string '!!!!!!'. Replace string '!' + x'010101' + '!' with '<->'.

Sample model definitions for PostScript output

The following table shows example values for the various fields of a model definition for printout on a PostScript printer. Control characters as well as hexadecimal or binary input requires the use of escape

characters. These are described in chapter 'ESCAPE characters in model definitions' on page 88. A description of the PostScript format as well as of the Postcript commands can be found in the manual ' PostScript® Language Reference' released by Adobe Systems Incorporated.

Screen mask: Model definitions **See Fig. 27 on page 68**	**Description / Meaning**
`Prefixdata......: textname`	The name of the text containing the prefix data. The content of this document will be inserted at the beginning of the print data. The text must contain the PostScript commands needed to set up the printer.

`Content of prefix data text:`
`\x04\x\r\n`
`%!PS-Adobe-3.0\r\n`
`%%BeginSetup\r\n`
`%%BeginFeature: *Duplex Long Edge Binding\r\n`
`<</Duplex true\r\n`
`/Tumble false\r\n`
`>>setpagedevice\r\n`
`%%EndSetup\r\n`
`/ff\r\n`
`{ prtout\r\n`
`/savepage save def\r\n`
`showpage\r\n`
`savepage restore\r\n`
`12.0.....  coffset sub 0 translate\r\n`
`/temp coffset def\r\n`
`/coffset noffset def\r\n`
`/noffset temp def\r\n`
`coffset 0 translate\r\n`
`newpath 0 pgtop moveto\r\n`
`} def\r\n`
`/lf\r\n`
`{ prtout\r\n`
`0 Ldist rmoveto\r\n`
`/Ypos currentpoint exch pop def\r\n`
`Ypos 0 lt\r\n`
`{ ff } if\r\n`
`} def\r\n`
`/cr\r\n`
`{ prtout\r\n`
`/Ypos currentpoint exch pop def\r\n`
`0 Ypos moveto\r\n`
`} def\r\n`
`/bs\r\n`
`{ prtout\r\n`
`/Xpos currentpoint pop Cdist sub def\r\n`
`/Ypos currentpoint exch pop def\r\n`
`Xpos 0.0 ge\r\n`
`{ Xpos Ypos moveto }\r\n`
`{ cr } ifelse\r\n`
`} def\r\n`
`/prtout\r\n`
`{ count 0 gt\r\n`
`{ currentpoint\r\n`
`/Ypos exch Udist sub def\r\n`
`/Xpos exch def\r\n`
`Cdist xshow\r\n`
`currentpoint\r\n`
	Header info including PostScript version
	
	Printer setup informationen
	
	Definition ff (\f - Forms Feed)
	
	Definition lf (\n - New Line)
	
	Definition cr (\r - Carriage Return)
	
	Definition bs (\b - Back Space)
	
	Definition prtout (with underscores)

```
      /Ysav exch def\r\n
      /Xsav exch def\r\n
      Usc\r\n
      { Xpos Ypos moveto\r\n
        Lwidth setlinewidth\r\n
        Xsav Ypos lineto stroke\r\n
        Xsav Ysav moveto\r\n
      } if\r\n
    } if\r\n
  } def\r\n
  /Courier-BoldLatin\r\n
  << /Courier-Bold findfont {} forall >>\r\n
   begin\r\n
    /Encoding ISOLatin1Encoding\r\n
    256 array copy def currentdict\r\n
   end\r\n
  definefont pop\r\n
  /Courier-ItalicLatin\r\n
  << /Courier-Oblique findfont {} forall
  >>\r\n
   begin\r\n
    /Encoding ISOLatin1Encoding\r\n
    256 array copy def currentdict\r\n
   end\r\n
  definefont pop\r\n
  /Courier-Latin\r\n
  << /Courier findfont {} forall >>\r\n
   begin\r\n
    /Encoding ISOLatin1Encoding\r\n
    256 array copy def currentdict\r\n
   end\r\n
  definefont pop\r\n
  /Symbol false def\r\n
  /Bold false def\r\n
  /sfc\r\n
  { prtout\r\n
    Bold\r\n
    { /Courier-BoldLatin 9.0 selectfont }\r\n
    { /Courier-Latin 9.0 selectfont }
  ifelse\r\n
    /Symbol false def\r\n
  } def\r\n
  /sfs\r\n
  { prtout\r\n
    Bold\r\n
    { /SymbolBold 9.0 selectfont }\r\n
    { /Symbol 9.0 selectfont } ifelse\r\n
    /Symbol true def\r\n
  } def\r\n
  /boldon\r\n
  { prtout\r\n
    Symbol\r\n
    { /Symbol-Bold 9.0 selectfont }\r\n
    { /Courier-Bold 9.0 selectfont }
  ifelse\r\n
    /Bold true def\r\n
  } def\r\n
  /boldoff\r\n
  { prtout\r\n
    Symbol\r\n
    { /Symbol 9.0 selectfont }\r\n
```

Definition Font Courier-BoldLatin

Definition Font Courier-ItalicLatin

Definition Font Courier-Latin

No symbol set
No bold face type
Definition sfc (activate standard font)

Definition sfs (activate symbol font)

Definition boldon (activate bold face type)

Definition boldoff (deactivate bold face type)

{ /Courier 9.0 selectfont } ifelse\r\n /Bold false def\r\n } def\r\n	Definition cpi10 (10 characters per inch)
/cpi10 { prtout /Cdist [256 { 7.2 } repeat] def } def\r\n	Definition cpi15 (15 characters per inch)
/cpi15 { prtout /Cdist [256 { 4.8 } repeat] def } def\r\n	Definition lpi3 (3 lines per inch)
/lpi3 { prtout /Ldist -24.0 def } def\r\n	Definition lpi4 (4 lines per inch)
/lpi4 { prtout /Ldist -18.0 def } def\r\n	Definition lpi6 (6 lines per inch)
/lpi6 { prtout /Ldist -12.0 def } def\r\n	Definition lpi8 (8 lines per inch)
/lpi8 { prtout /Ldist -9.0 def } def\r\n	Definition uscon (Begin underscore)
/uscon { prtout /Usc true def } def\r\n	Definition uscoff (End underscore)
/uscoff { prtout /Usc false def } def\r\n	Start settings:
/coffset 4.0 def\r\n /noffset 4.0 def\r\n /Lwidth 0 def\r\n /Udist 2.0 def\r\n uscoff\r\n boldoff\r\n lpi6\r\n cpi10\r\n	Set position to 1. line and 1. column.
sfc\r\n clippath pathbbox\r\n /pgtop exch def\r\n pop /y exch def y translate\r\n /pgtop pgtop y sub 14.2 sub Ldist add def\r\n coffset 0 translate\r\n newpath 0 pgtop moveto\r\n (	Begin of data (start string)
Suffixdata.....: textname	The name of the text containing the suffix data. The content of this document will be inserted at the end of the print data.
Content of suffix data text:) ff/r/n/x04\x	Page feed + EOT marker
ESC-Character...: \	The escape character that will be used in combination with another character to insert printer control characters and binary data into the data stream.
Automatic line/forms feed..: X	Activate automatic forms and line feed respectively. If the defined maximum number of lines is reached, a forms feed will be automatically included. If the defined maximum number of characters per line is reached, a line feed will be automatically included.
Max lines per page.....: 072	Automatic forms feed after 72 printed lines.
Max characters per line....: 132	Automatic line feed after 132 printed characters.
Printer specific hex data:	If this option is specified with an 'X' the

`Interpret data as 2 byte hexa EBCDIC(yes=X): X`	hexadecimal print data will be converted from a 2 byte character code into a 1 byte hexadecimal representation. Otherwise the hexadecimal data will be printed as is.

`Start identifier:`
`Hostdata........: §§1B`
 	
`replace with....: \x1B`
	Indicator for the beginning of hexadecimal data.
	
	Hexadecimal characters to be insered before the hexadecimal print data.

`End identifier:`
`Hostdata........: §`
 	
`replace with....:`
	Indicator for the end of hexadecimal data.
	
	Hexadecimal characters to be insered after the hexadecimal print data.

`Channels:`
`Nr  replace with  Line`
`01  1`
	Nr - channel number
	replace with – no direct positioning using PostScript command or a PostScript definition.
	Line – Logical line number correlating with the defined channel feed.
	If no replacement is specified blank lines will be inserted until the specified line number is reached. The internal line counter for the automatic page feed will be set to 1.
	The current print position will be set to line 1.

`02  11`	The current print position will be set to line 11.
`03  21`	The current print position will be set to line 21.
`04  31`	The current print position will be set to line 31.
`05  41`	The current print position will be set to line 41.

Screen mask: Printer controls **See Fig. 28 on page 71**	**Define the replacements to be printed instead of the particular printer or JES commands.** **Before the definition starts, the current data string has to be terminated with the character ')' and afterwards the data string has to be opened again with the character '('.** **The characters '\r\n' (carriage return + line feed) have to be inserted in order to split the Postcript data string into multiple lines.**
`Forms feed.....: ) ff\r\n(`	Call ff to insert forms feed.
`Carriage return.....: ) cr\r\n(`	Call cr to set the position to the line start.
`Line feed.....: ) nl\r\n(`	Call nl to insert line feed.
`Backspace.....: ) bs\r\n(`	Call bs to set position to -1.
`Std line density.....: ) lpi6\r\n(`	Set default line density to 6 lines per inch.
`3 lines per inch.....: ) lpi3\r\n(`	Set line density to 3 lines per inch.
`4 lines per inch.....: ) lpi4\r\n(`	Set line density to 4 lines per inch.
`6 lines per inch.....: ) lpi6\r\n(`	Set line density to 6 lines per inch.
`8 lines per inch.....: ) lpi8\r\n(`	Set line density to 8 lines per inch.
`10 characters per inch.: ) cpi10\r\n(`	Set character density to 10 characters per inch.
`15 characters per inch.: ) cpi15\r\n(`	Set character density to 15 characters per inch.
`Begin bold print.....: ) boldon\r\n(`	Set character print width to 3 (possible: -7 to 7).
`End bold print.....: ) boldoff\r\n(`	Set character print width to 0 (normal).
`Begin underscore print.: ) uscon\r\n(`	Print with underscores.
`End underscore print...: ) uscoff\r\n(`	Print without underscores.

Screen mask: Printer char replacement **See Fig. 29 on page 73**	**Define common replacements for print data.**
`Hostdata  replace with` `\x9F  sfs (\240) sfc\r\n`	Replace hexadecimal character 0x9F (EURO sign) with the octal character \240 ('€') from the

	symbol font.

Sample model Definitions for PDF output (e-mail)

The following table shows example values for the various fields of a model definition used to create PDF documents. Control characters as well as hexadecimal or binary input requires the use of escape characters. These are described in chapter 'ESCAPE characters in model definitions' on page 88. A description of the PDF format as well as of the PDF objects can be found in the manual 'PDF Reference' released by Adobe Systems Incorporated.

Screen mask: Model definitions See Fig. 27 on page 68	Description / Meaning
`Prefixdata......: textname`	The name of the text containing the prefix data. This document must contain the header information including the PDF version used and any object information for the page format and the resources used. Object numbers must not be used more than once. Dictionary entries automatically added by PrintEx need not be defined. Automatic addition will only be carried out if the respective object has been specified

`Content of prefix data text:`
`%PDF-1.3\r\n`
`1 0 obj\r\n`
`<<\r\n`
`/Type /Info\r\n`
`>>\r\n`
`endobj\r\n`
 	
`2 0 obj\r\n`
`<<\r\n`
`/Type /Catalog\r\n`
`/Pages 3 0 R\r\n`
`/PageLayout /SinglePage\r\n`
`/MarkInfo << /Marked /true >>\r\n`
`>>\r\n`
`endobj\r\n`
`3 0 obj\r\n`
`<<\r\n`
`/Type /Pages\r\n`
`/MediaBox [-25 0 612 840]\r\n`
`>>\r\n`
`endobj\r\n`
`4 0 obj\r\n`
`<<\r\n`
`/Type /Font\r\n`
`/Subtype /Type1\r\n`
`/Name /F1\r\n`
`/BaseFont /Courier\r\n`
`/Encoding 9 0 R\r\n`
`/FirstChar 0\r\n`
`/LastChar 255\r\n`
`/Widths 6 0 R\r\n`
`>>\r\n`
`endobj\r\n`
`5 0 obj\r\n`
`<<\r\n`
`/Type /Font\r\n`
`/Subtype /Type1\r\n`
	Header information including PDF version
	Objekt /Info (optional)
	the following entries are added:
	/Title (PrintEx file name)\r\n
	/Producer (PrintEx V1.0(XPS Software GmbH, 2006))\r\n
	/CreationDate (D:yyyymmddhhmmss)\r\n
	
	Object /Catalog (required)
	Reference to /Pages Object (required)
	
	Object /Pages (required)
	the following entries are added:
	/Count nnn\r\n
	/Kids [n 0 R n+3 0 R n+6 0 R ...]\r\n
	
	Object /Font /F1 (at least 1 font object is required)
	
	Object /Font /F2

/Name /F2\r\n	
/BaseFont /Courier-BoldOblique\r\n	
/Encoding << /BaseEncoding /WinAnsiEncoding	
>>\r\n	
/FirstChar 0\r\n	
/LastChar 255\r\n	
/Widths 6 0 R\r\n	
>>\r\n	
endobj\r\n	Object with indication for /Width (= width of a single character in 1/1000 inch)
6 0 obj\r\n	
[600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600\r\n	
600 600 600 600 600 600 600 600	
600 600 600 600 600 600 600 600]\r\n	Object specifying the character set
endobj\r\n	
9 0 obj\r\n	
<<\n/Type /Encoding\n	
/Differences [0 /.notdef /.notdef /.notdef	
/.notdef\n	
/.notdef /.notdef /.notdef /.notdef /.notdef	
/.notdef\n	
/.notdef /.notdef /.notdef /.notdef /.notdef	
/.notdef\n	
/.notdef /.notdef /.notdef /.notdef /.notdef	
/.notdef\n	
/.notdef /.notdef /.notdef /.notdef /.notdef	
/.notdef\n	
/.notdef /.notdef /.notdef /.notdef /space	
/exclam\n	
/quotedbl /numbersign /dollar /percent	
/ampersand\n	
/quoteright /parenleft /parenright /asterisk	
/plus /comma\n	

/hyphen /period /slash /zero /one /two /three /four /five\n /six /seven /eight /nine /colon /semicolon /less /equal\n /greater /question /at /A /B /C /D /E /F /G /H /I /J /K /L\n /M /N /O /P /Q /R /S /T /U /V /W /X /Y /Z /bracketleft\n /backslash /bracketright /asciicircum /underscore\n /quoteleft /a /b /c /d /e /f /g /h /i /j /k /l /m /n /o /p\n /q /r /s /t /u /v /w /x /y /z /braceleft /bar /braceright\n /asciitilde /.notdef /.notdef /.notdef /.notdef /.notdef\n /.notdef /.notdef /.notdef /.notdef /.notdef /.notdef\n /.notdef /.notdef /.notdef /.notdef /.notdef /.notdef\n /dotlessi /grave /acute /circumflex /tilde /macron /breve\n /dotaccent /dieresis /.notdef /ring /cedilla /.notdef\n /hungarumlaut /ogonek /caron /space /exclamdown /cent\n /sterling /currency /yen /brokenbar /section /dieresis\n /copyright /ordfeminine /guillemotleft /logicalnot /hyphen\n /registered /macron /degree /plusminus /twosuperior\n /threesuperior /acute /mu /paragraph /periodcentered\n /cedilla /onesuperior /ordmasculine /guillemotright\n /onequarter /onehalf /threequarters /questiondown /Agrave\n /Aacute /Acircumflex /Atilde /Adieresis /Aring /AE\n /Ccedilla /Egrave /Eacute /Ecircumflex /Edieresis /Igrave\n /Iacute /Icircumflex /Idieresis /Eth /Ntilde /Ograve\n /Oacute /Ocircumflex /Otilde /Odieresis /multiply /Oslash\n /Ugrave /Uacute /Ucircumflex /Udieresis /Yacute /Thorn\n /germandbls /agrave /aacute /acircumflex /atilde /adieresis\n /aring /ae /ccedilla /egrave /eacute /ecircumflex\n /edieresis /igrave /iacute /icircumflex /idieresis /eth\n /ntilde /ograve /oacute /ocircumflex /otilde /odieresis\n /divide /oslash /ugrave /uacute /ucircumflex /udieresis\n /yacute /thorn /ydieresis]\n >>\n endobj\r\n	Object /Resources (required)

7 0 obj\r\n <<\r\n /Font << /F1 4 0 R /F2 5 0 R >>\r\n /XObject << /Im0 10 0 R >>\r\n /ProcSet [/PDF /Text \ImageC] \r\n >>\r\n endobj\r\n 8 0 obj\r\n <<\r\n /Type /Page\r\n /Parent 3 0 R\r\n /Resources 7 0 R\r\n >>\r\n endobj\r\n 10 0 obj\r\n <<\r\n /Type /XObject\r\n /Subtype /Image\r\n /Width 1190\r\n /Height 1683\r\n /ColorSpace /DeviceRGB\r\n /BitsPerComponent 8\r\n /Filter /DCTDecode \r\n >>\r\n stream\r\n \a$$ASIS-DATEN$$\a %INCLUDE STREAM=FORMJPG% $$ASIS-DATEN$$ \r\nendstream\r\n endobj\r\n	Object /Page (required) (this object will be duplicated for every output page) Reference to obejct /Pages Reference to obejct /Resources the following entry will be added in each case /Contents nnn R (Reference to the data) Object /Image (contains information about the forms data) the following entry for the length of the data will be added /Length nnn\r\n width of the image file height of the image file color definition (/Device Gray/RGB/CMYK) number of bits per color component Image file (.JPG). In order to be used the image file has to be uploaded to the XPS-MACLIB using FTP.
Suffixdata.....: textname	The name of the text containing the suffix data. This document needs to contain the basic settings for the editing of the print data. A description of the valid PDF parameters will be given in the following table 'PDF parameters'. The parameters listed in the table can also be used to replace printer controls.
Content of suffix data text: tm=825 lm=20 fn=/F1 fs=8 ud=2 uw=0.25 lh=9.0 cw=4.8 cd=1.1	All values are in 1/72 inch.
ESC-Character...: \	The escape character that will be used in combination with another character to insert printer control characters and binary data into the data stream.
Automatic line/forms feed..: X	Activate automatic forms and line feed respectively. If the defined maximum number of lines is reached, a forms feed will be automatically included. If the defined maximum number of characters per line is reached, a line feed will be automatically included.
Max lines per page.....: 072	Automatic forms feed after 72 printed lines.
Max characters per line....: 132	Automatic line feed after 132 printed characters.
Printer specific hex data: Interpret data as 2 byte hexa EBCDIC(yes=X): X	If this option is specified with an 'X' the hexadecimal print data will be converted from a 2 byte character code into a 1 byte hexadecimal representation. Otherwise the hexadecimal data will be printed as is.
Start identifier: Hostdata.....: §BEGHEX replace with....:	Indicator for the beginning of hexadecimal data. Hexadecimal characters to be insered before the hexadecimal print data.
End identifier:	Indicator for the end of hexadecimal data.

Hostdata.....: §ENDHEX replace with....:	Hexadecimal characters to be insered after the hexadecimal print data.
Channels: Nr replace with Line 01 vp=811 1	Nr - channel number replace with – parameter input to indicate the desired vertical position. Line – Logical line number correlating with the defined channel feed. If no replacement is given blank lines will be inserted until the specified line number will be reached. The internal line counter for the automatic page feed will be set to 1. The current print position will be set to a distance of 811 * 1/72 inch from the lower edge which is equal to print line 1.
02 vp=721 11	The current print position will be set to a distance of 721 * 1/72 inch from the lower edge which is equal to print line 11.
03 vp=631 21	The current print position will be set to a distance of 631 * 1/72 inch from the lower edge which is equal to print line 21.
04 vp=541 31	The current print position will be set to a distance of 541 * 1/72 inch from the lower edge which is equal to print line 31.
05 vp=451 41	The current print position will be set to a distance of 451 * 1/72 inch from the lower edge which is equal to print line 41.

Screen mask: Printer controls See Fig. 28 on page 71	**Define the replacements to be printed instead of the particular printer or JES commands respectively.**
Forms feed.....: q\n595 0 0 841.5 0 0cm\n/Im0 Do\nQ\n	This data will be inserted at the beginning of the data stream for every page.
Carriage return.....:	This input will be ignored because the function will be processed internally.
Line feed.....:	This input will be ignored because the function will be processed internally.
Backspace.....:	This input will be ignored because the function will be processed internally.
Std line density.....: lh=12	Set default line density to 6 lines per inch.
3 lines per inch.....: lh=24	Set line density to 3 lines per inch.
4 lines per inch.....: lh=18	Set line density to 4 lines per inch.
6 lines per inch.....: lh=12	Set line density to 6 lines per inch.
8 lines per inch.....: lh=9	Set line density to 8 lines per inch.
10 characters per inch.: cd=2.4	Set character density to 10 characters per inch.
15 characters per inch.: cd=0.0	Set character density to 15 characters per inch.
Begin bold print.....: fn=/F2 fs=8	Activate font /F2 for bold print.
End bold print.....: fn=/F1 fs=8	Activate font /F1 normal print.
Begin underscore print.:	No input will be required if the parameters 'uw=' and 'ud=' have been specified in the suffix data.
End underscore print...:	No input required.

Screen mask: Printer char replacement See Fig. 29 on page 73	**Define common replacements for print data.**
Hostdata replace with \x9F \240	Replace the hexadecimal character 0x9F with the octal character '\240' = EURO sign.

PDF parameters:

Variable	Description	Example value (1/72 inch)

lh=	line height	10
cd=	additional character pitch	0.2
cw=	character width	6.0 (will be calculated using the formula: /Width / 1000 * fs)
fn=	font name	/F1
fs=	font size	10
lm=	left margin	25
tm=	top margin	820
du=	underscore distance	2
uw=	width of underscore line	0.25
vp=	vertical position	480
hp=	horizontal position	200

Sample model definition for JES output

The following table shows example values for the various fields of a model definition used to create JES output.

Screen mask: Model definitions See Fig. 27 on page 68	Description / Meaning
Prefixdata.....: textname	The name of the text containing the prefix data. The content of this document will be inserted at the beginning of the print data (not required).
Suffixdata.....: textname	The name of the text containing the suffix data. The content of this document will be inserted at the end of the print data (not required).
ESC-Character...: \	The escape character that will be used in combination with another character to insert printer control characters and binary data into the data stream.
Automatic line/forms feed..: X	Activate automatic forms and line feed respectively. If the defined maximum number of lines is reached, a forms feed will be automatically included. If the defined maximum number of characters per line is reached, a line feed will be automatically included.
Max lines per page.....: 072	Automatic forms feed after 72 printed lines.
Max characters per line....: 132	Automatic line feed after 132 printed characters.
Printer specific hex data: Interpret data as 2 byte hexa EBCDIC(yes=X): X	If this option is specified with an 'X' the hexadecimal print data will be converted from a 2 byte character code into a 1 byte hexadecimal representation. Otherwise the hexadecimal data will be printed as is.
Start identifier: Hostdata.....: §BEGHEX replace with....:	Indicator for the beginning of hexadecimal data. Hexadecimal characters to be insered before the hexadecimal print data.
End identifier: Hostdata.....: §ENDHEX replace with....:	Indicator for the end of hexadecimal data. Hexadecimal characters to be insered after the hexadecimal print data.
Channels: Nr replace with Line 01 \x89 1	Nr - channel number replace with – JES control character. Line – Logical line number correlating with the defined channel feed. If no replacement is given blank lines will be inserted until the specified line number is reached. The internal line counter for the

		automatic page feed will be set to 1. Feed to channel 1 = line 1.
02	\x91	11	Feed to channel 2 = line 11.
03	\x99	21	Feed to channel 3 = line 21.
04	\xA1	31	Feed to channel 4 = line 31.
05	\xA9	41	Feed to channel 5 = line 41.
06	\xB1	51	Feed to channel 6 = line 51.
07	\xB9	61	Feed to channel 7 = line 61.
08	\xC1	___	Feed to channel 8, internal line counter will be reset to 0.
09	\xC9	___	Feed to channel 9, internal line counter will be reset to 0.
10	\xD1	___	Feed to channel 10, internal line counter will be reset to 0.
11	\xD9	___	Feed to channel 11, internal line counter will be reset to 0.
12	\xE1	___	Feed to channel 12, internal line counter will be reset to 0.

Screen mask: Printer controls **See Fig. 28 on page 71**	**All input into this screen mask will be ignored due to the fact that the commands cannot be converted.**
Forms feed.....:	Input will be ignored.
Carriage return.....:	Input will be ignored.
Line feed.....:	Input will be ignored.
Backspace.....:	Input will be ignored.
Std line density.....:	Input will be ignored.
3 lines per inch.....:	Input will be ignored.
4 lines per inch.....:	Input will be ignored.
6 lines per inch.....:	Input will be ignored.
8 lines per inch.....:	Input will be ignored.
10 characters per inch.:	Input will be ignored.
15 characters per inch.:	Input will be ignored.
Begin bold print.....:	Input will be ignored.
End bold print.....:	Input will be ignored.
Begin underscore print.:	Input will be ignored.
End underscore print...:	Input will be ignored.

Screen mask: Printer char replacement **See Fig. 29 on page 73**		**Define common replacements for print data.**
Hostdata	replace with	
ä	ae	Replace character 'ä' with 'ae'
ö	oe	Replace chatacter 'ö' with 'oe'
ü	ue	Replace character 'ü' with 'ue'
Ä	AE	Replace character 'Ä' with 'AE'
Ö	OE	Replace character 'Ö' with 'OE'
Ü	UE	Replace character 'Ü' with 'UE'
ß	ss	Replace character 'ß' with 'ss'

Sample model definitions for VTAM-SCS output

The following table shows example values for the various fields of a model definition for printout on VTAM-SCS printers. Control characters as well as hexadecimal or binary input requires the use of escape characters. These are described in chapter 'ESCAPE characters in model definitions' on page 88.

Screen mask: Model definitions **See Fig. 27 on page 68**	**Description / Meaning**

Prefixdata.....: textname	The name of the text containing the prefix data. The content of this document will be inserted at the beginning of the print data.
Suffixdata.....: textname	The name of the text containing the suffix data. The content of this document will be inserted at the end of the print data.
ESC-Character...: \	The escape character that will be used in combination with another character to insert printer control characters and binary data into the data stream.
Automatic line/forms feed..: X	Activate automatic forms and line feed respectively. If the defined maximum number of lines is reached, a forms feed will be automatically included. If the defined maximum number of characters per line is reached, a line feed will be automatically included.
Max lines per page.....: 072	Automatic forms feed after 72 printed lines.
Max characters per line....: 132	Automatic line feed after 132 printed characters.
Printer specific hex data: Interpret data as 2 byte hexa EBCDIC(yes=X): X	If this option is specified with an 'X' the hexadecimal print data will be converted from a 2 byte character code into a 1 byte hexadecimal representation. Otherwise the hexadecimal data will be printed as is.
Start identifier: Hostdata.....: §BEGHEX replace with....:	Indicator for the beginning of hexadecimal data. Hexadecimal characters to be insered before the hexadecimal print data.
End identifier: Hostdata.....: §ENDHEX replace with....:	Indicator for the end of hexadecimal data. Hexadecimal characters to be insered after the hexadecimal print data.
Channels: Nr replace with Line 01 \x0401 1	Nr - channel number replace with - SCS command for the channel feed. Line – Logical line number correlating with the defined channel feed. If no replacement is given blank lines will be inserted until the specified line number is reached. The internal line counter for the automatic page feed will be set to 1. Feed to channel 1 = print line 1.
02 \x0402 11	Feed to channel 2 = print line 11.
03 \x0403 21	Feed to channel 3 = print line 21.
04 \x0404 31	Feed to channel 4 = print line 31.
05 \x0405 41	Feed to channel 5 = print line 41.
06 \x0406 51	Feed to channel 6 = print line 61.
07 \x0407 61	Feed to channel 7 = print line 61.
08 \x0408 ___	Feed to channel 8, internal line counter will be reset to 0.
09 \x0409 ___	Feed to channel 9, internal line counter will be reset to 0.
10 \x040A ___	Feed to channel 10, internal line counter will be reset to 0.
11 \x040B ___	Feed to channel 11, internal line counter will be reset to 0.
12 \x040C ___	Feed to channel 12, internal line counter will be reset to 0.

Screen mask: Printer controls **See Fig. 28 on page 71**	**Define the replacements to be printed instead of the particular commands.**
Forms feed.....: \x0C	Output for FORMSFEED (0x0C).
Carriage return.....: \x0D	Output for CARRIAGE RETURN (0x0D).

`Line feed.....: \x25`	Output for LINE FEED (0x0A).
`Backspace.....: \x16`	Output for BACK SPACE (0x16).
`Std line density.....: \x2BC601`	Set default line density to 6 lines per inch.
`3 lines per inch.....: \x2BC60218`	Set line density to 3 lines per inch.
`4 lines per inch.....: \x2BC60212`	Set line density to 4 lines per inch.
`6 lines per inch.....: \x2BC6020C`	Set line density to 6 lines per inch.
`8 lines per inch.....: \x2BC60209`	Set line density to 8 lines per inch.
`10 characters per inch.: \x2BD204290A0A`	Set character density to 10 characters per inch.
`15 characters per inch.: \x2BD204290F0F`	Set character density to 15 characters per inch.
`Begin bold print.....:`	Input will be ignored.
`End bold print.....:`	Input will be ignored.
`Begin underscore print.: \x280141F4`	Print with underscores.
`End underscore print...: \x28014100`	Print without underscores.

Screen mask: Printer char replacement **See Fig. 29 on page 73**		**Define common replacements for print data.**
`Hostdata` `\x9F`	`replace with` `EURO`	Replace the hexadecimal character 0x9F (EURO) with the string 'EURO'

ESCAPE characters in model definitions

The following table contains an overview of ESCAPE characters that can be used to insert printer control characters as well as hexadecimal or binary input into the generated output data.

ESCAPE-characters can be used in all fields of the model definitions and also in prefix and suffix texts. Every ESCAPE-sequence consists of the identifier defined in the field 'ESC-Character' in the 'Model definitions' screen mask (page 68) followed by an additional identification character. In the following table it is assumed that the 'ESC-Character' has been set to the back slash character '\'.

ESCAPE sequence	Description
`\e`	Escape (output data = 0x1B, host data = 0x27)
`\f`	Forms Feed (output data = 0x0C, host data = 0x0C)
`\n`	New Line (output data = 0x0A, host data = 0x15)
`\r`	Carriage Return (output data = 0x0D, host data = 0x0D)
`\b`	Back Space (output data = 0x08, host data = 0x08)
`\x`	Subsequent data will be changed from 2 byte hexadecimal to 1 byte binary. Only characters '0' – '9' and 'A' – 'F' are allowed. Recurrence of the '\x' sequence will terminate the hexadecimal mode.
`\a`	If the sequence \aSTRING\a is specified, all data following the sequence will be copied unchanged into the data stream until recurrence of the STRING is detected. Using this method it is possible to insert binary data into the prefix and suffix texts respectively, e. g., to add overlay images.
`\a\h`	If the sequence \a\hSTRING\a is specified, all data following the sequence will be converted into hexadecimal character code until recurrence of the STRING is detected. This makes it possible to insert binary data (e. g. images) into prefix, suffix or reference texts respectively which will later on be processed by PostScript's '/ASCIIHexDecode' filter if the chosen PostScript printer does not support the '/SubFileDecode' filter.
`\a\8`	If the sequence \a\8STRING\a is specified, all data following the sequence will be converted into ASCII base-85 character code until recurrence of the STRING is detected. This makes it possible to insert binary data (e. g. images) into prefix, suffix or reference texts respectively which will later on be processed by PostScript's '/ASCIIHexDecode' filter if the chosen PostScript printer does not support the '/SubFileDecode' filter.

Forms / image files

PrintEx enables the inclusion of image files (JPEG, TIFF …) into the print data if PostScript or PDF output is generated.

Image files have to be transferred binary to the 'XPSDAEM.V600.DATA' library using UPLOAD in order to be used by PrintEx.

Futhermore it is possible to store image files in OMVS. If this method is chosen it is necessary to fully qualify the name of an image file wherever it is referenced (e. g. /xps/images/muster.jpg).

The PrintEx system parameters contain an option named 'Path for imagefiles' which can be used to define a standard path to an OMVS location where image files are stored. If this option is set it is possible to reference image files at this location using the '&PATH' variable (e. g. /&PATH/muster.jpg).

Using the statement '%INCLUDE STREAM=filename%' an image file can be included in a prefix text, in a text used to cause a page feed or in a printer character replacement string.

In order to avoid automatic replacement of data contained in the image file itself the ESCAPE-sequence '\aSTRING\a' has to be inserted immediately in front of the 'INCLUDE STREAM=' statement.

By inserting the chosen STRING again behind the 'INCLUDE STREAM=' statement automatic replacement will be turned on again.

If '\a\hSTRING\a' is used instead, the following image data will be converted to 2 byte hexadecimal ASCII code and if '\a\8STRING\a' is used, data will be converted to ASCII base-85 code.

In this case it is necessary to use the ASCIIHexEncode filter or the ASCII85Encode filter repectively for the processing of the image file.

PostScript example (with conversion to ASCII base-85):

```
) gsave\r\n
/DeviceRGB setcolorspace\r\n
0.0 coffset sub 0 translate\r\n
595.0 800.0 scale\r\n
495.0 coffset sub 740.0 translate\r\n
100.0 100.0 scale\r\n
<<\r\n
 /ImageType 1\r\n
 /Width 354\r\n
 /Height 354\r\n
 /BitsPerComponent 8\r\n
 /Decode [0 1 0 1 0 1]\r\n
 /ImageMatrix [354 0 0 -354 0 354]\r\n
 /DataSource currentfile\r\n
 /ASCII85Decode filter\r\n
 /DCTDecode filter\r\n
>>\r\n
image
\a\8§§END-ASIS\a
%INCLUDE STREAM=FORMJPG1%
§§END-ASIS
~>
\r\ngrestore\r\n(
```

PDF example:

```
10 0 obj\r\n
<<\r\n
/Type /XObject\r\n
/Subtype /Image\r\n
/Width 1190\r\n
```

```
/Height 1683\r\n
/ColorSpace /DeviceRGB\r\n
/BitsPerComponent 8\r\n
/Filter /DCTDecode \r\n
>>\r\n'
stream\r\n
%INCLUDE STREAM=FORMJPG1%
\r\nendstream\r\n
Endobj\r\n
```

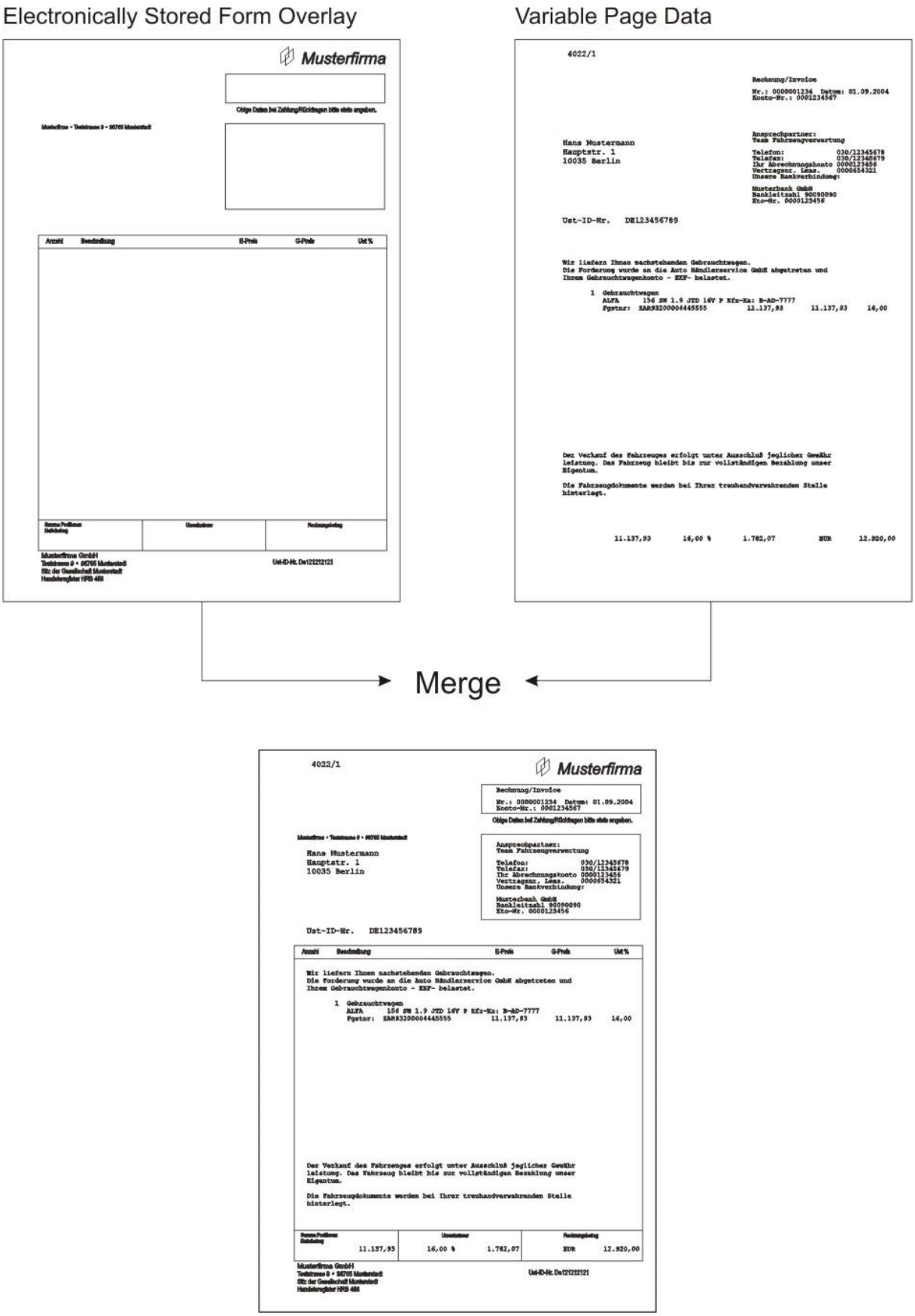


Fig. 30: Forms creation

Text Definitions

PrintEx allows the use of prefix and suffix texts in the context of the definition of models. Menu option '6 Text Definitions' can be used to create and maintain these texts. Texts can be attached to any number of printers via the model interface thus avoiding multiple definitions of texts with equal content.

Choosing the menu option '6 Text Definitions' will lead to the screen mask shown below.

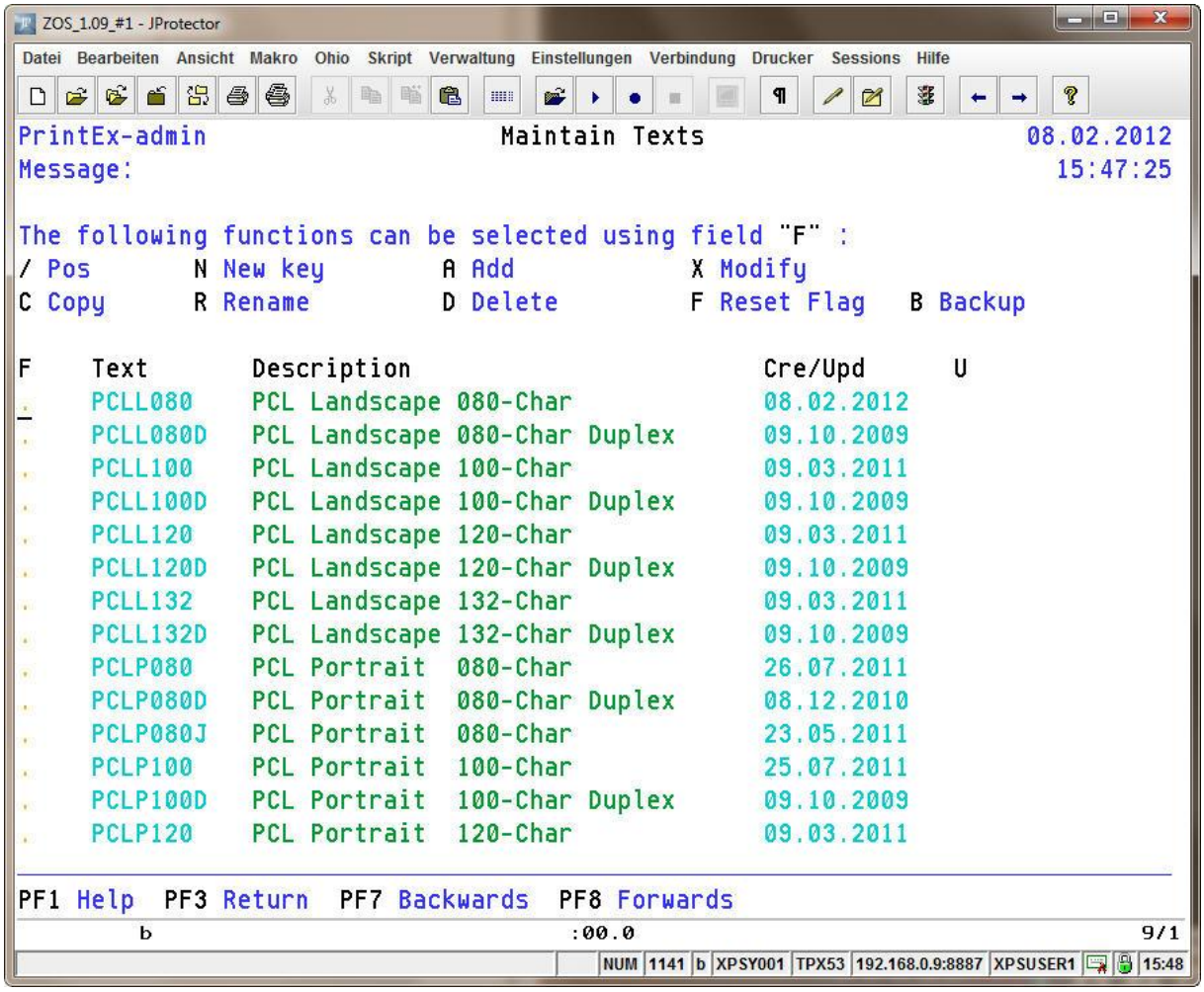


Fig. 31: Text definitions

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

Description of the fields

F	Choice box for one of the functions listed in the screen mask header.
Text	Name of the text (max. 8 characters long).
Description	A description of the text with up to 20 characters.
Cre/Upd	Creation date or date of last text update.
U	Flag showing the current text state. If this field contains 'X' the text is currently being edited.

Function selection

Field 'F' can be used to choose one of the functions listed in the screen mask header.

/	**Pos**

The display will be rearranged moving the selected entry to the top of the list.

N	**New key**

Using this function a new entry can be selected to be moved to the top of the list.

To achieve this, a window for the input of the new start position is displayed. The input will be processed as a generic name. That is, the first entry found greater or equal to the input name will become the first entry in the list.

R	**Rename**

The selected entry can be renamed using function 'R'.

For the purpose of documentation the current name of the entry will be displayed in the entry mask where the new entry name can be specified. The chosen entry will only be renamed if the newly specified name is unique.

The newly chosen text name must be unique.

D	**Delete**

The selected text can be deleted using function 'D'.

After confirmation by pressing the Enter key the selected entry will be deleted from the text index. For the purpose of documentation the name of the entry about to be deleted will be displayed in the window asking for the delete confirmation.

A	**Add**

New texts can be created using function 'A' by defining a name for the new text in an input mask displayed in response to the function selection.

The chosen text name has to be unique.

C	**Copy**

Existing texts can be copied using function 'C' by defining a name for the copy of the text in an input mask displayed in response to the function selection.

The chosen name for the copy has to be unique.

F Reset Flag

If a text is locked for editing ('X' is shown in column 'U'), using the function 'F Reset Flag' the text can be explicitly unlocked for editing.

This function should only be used if it is assured that no other user is currently editing the locked text. Otherwise it is possible to corrupt or even to destroy the text.

X Modify

Texts can be edited using function 'X'. Selecting this function will open the selected text in the PrintEx text editor.

Text Editor

The PrintEx text editor can be used to create and edit texts to be used as prefix or suffix texts. Using the editor texts of arbitrary length can be processed. The maximum line width for a text is 132 characters.

After installation a number of prefix and suffix texts will already be available. These contain default settings for PCL, PostScript and Adobe PDF output.

The following figure shows an example of a text being edited in the PrintEx text editor.

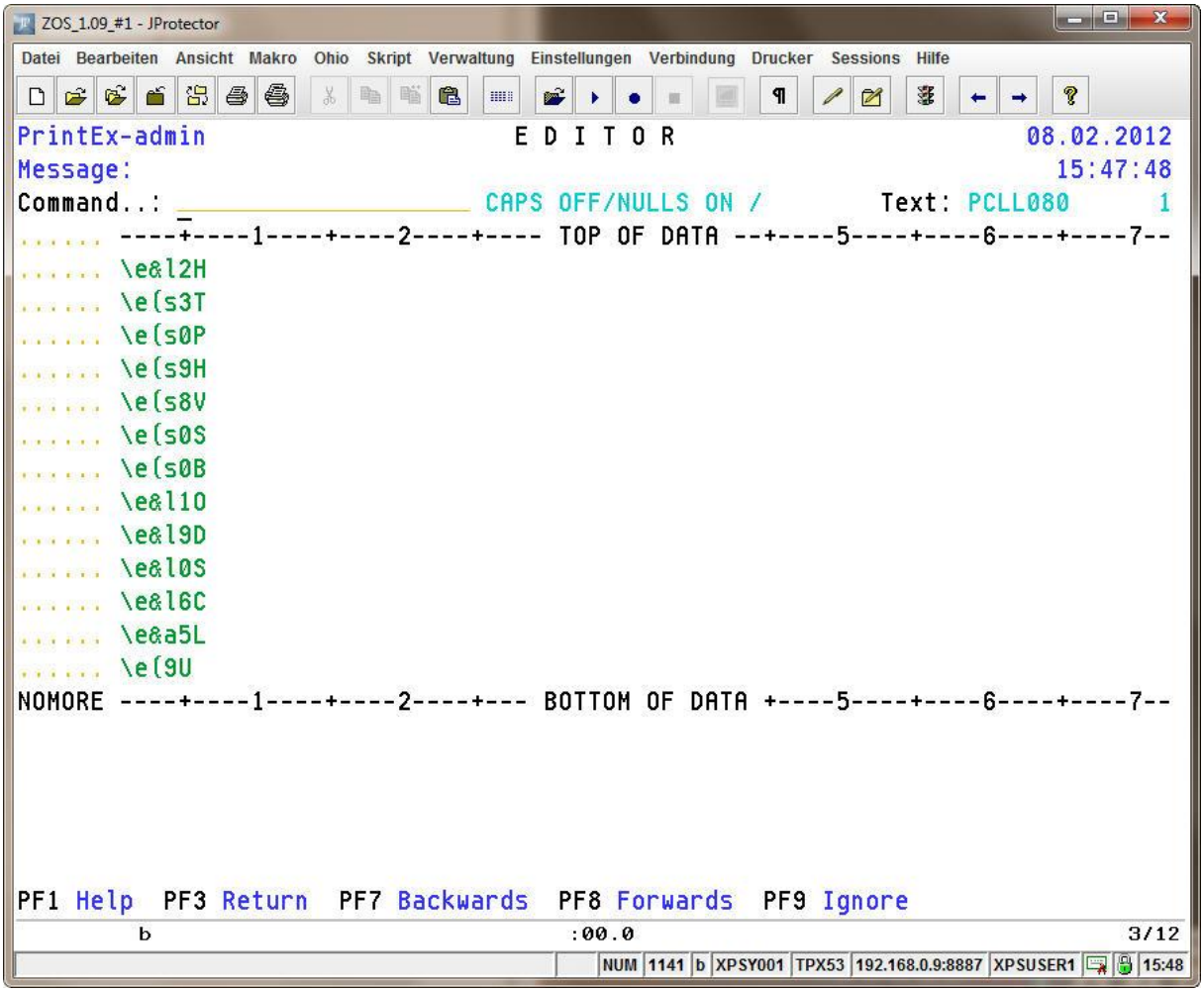


Fig. 32: Text editor

Function keys assigments

PF1 Display the online help.

PF3 Return to the text index. Any changes to the text being edited will be saved.

PF7 Scoll one page backward in the text. If the cursor is positioned in a text line, this line will become the last line in the editor display.

PF8 Scroll one page forward in the text. If the cursor is positioned in a text line, this line will become the first line in the editor display.

PF9 Ignore any changes made to the text since the Enter key was last pressed.

PF22 Scroll left to make column 1 visible.

PF23 Scroll right to make column 132 visible.

Description of the fields

Text state Line 3 of the editor displayes the current text state. The following values are possible:

State	Description
CAPS ON	All input will be translated to upper case.
CAPS OFF	All input will be processed as is without upper case translation.
NULLS ON	Lines of text are initialized with 'low values' making it possible to insert text.
NULLS OFF	Lines of text are initializes with 'blanks' making it impossible to insert text.
HEX ON	The text will be displayed in hexadecimal representation.
HEX OFF	The text will be displayed in readable EBCDIC characters.
separator = '/'	Dots in the text will be treated as normal characters.
separator = '.'	Dots in the text will be treated special.

Fig. 33: State of text editor

Text The name of the text currently being edited. The line number of the first line in the display is shown next to the name of the text.

Description of the input fields

The PrintEx text editor has three different kinds of input fields.

Command This field can be used to execute commands affecting the entire text, for example, to change the state of the text. The following table lists all commands recognized when entered in the command input field.

The '+cc' extension indicates that a specifying string like a search string is expected as a command extension. The extension has to be separated from the command with at least one blank.

The '+n' extension indicates a decimal number input may be specified together with the command. If present, the number input has to be separated from the command with at least one blank.

The '+nn' extension indicates that a corresponding number input must be specified with the command.

Column 'L' shows the minimum number of characters of the command which must be entered in order for the command to be recognized.

Command	L	Description

ATTDOT	4	Special treatment of dots will be activated. This mode should be used if hexadecimal characters without a corresponding printable EBCDIC character have been entered. These characters will be displayed as dots in the standard display mode 'HEX OFF'.
BOT	1	The end of the text will be displayed.
CANCEL	3	The editor will be closed without saving unsaved changes to the text.
CAPS OFF	8	Uppercase translation will be deactivated.
CAPS ON	7	Uppercase translation will be activated.
CDOTS	2	Command lines will be displayed as dots.
CLEFT	2	Command lines will be displayed left-justified.
CNUMBS	2	Command lines will be displayed as line numbers.
COLUMN +nn	3	The display will be newly arranged to start with the specified column.
CRIGHT	2	Command lines will be displayed right-justified.
DETDOT	4	Special treatment of dots will be deactivated
DOWN +nn	3	Scroll the given number of lines forward.
FIND +cc	3	The specified string will be searched downward from the current position. The topmost line in the display will not be searched.
FINDUP +cc	5	The specified string will be searched upward from the current position. The topmost line in the display will not be searched.
HEX OFF	7	The display will be reset to standard mode.
HEX ON	6	The text will be displayed in hexadecimal representation.
LEFT +n	3	The display will be scrolled left by the given number of columns.
LOCATE ++n	1	The specified line number will become the topmost line in the display.
NULLS OFF	9	Blanks will be used as fill characters. This makes the use of the insert mode impossible.
NULLS ON	8	Low values will be used as fill characters. This makes the use of the insert mode possible. This means that text right of the input cursor can be shifted right when the insert mode is active.
POS +cc	3	The specified string will be searched downward from the current position. The topmost line in the display will not be searched.
POSUP +cc	4	The specified string will be searched upward from the current position. The topmost line in the display will not be searched.
RESET	3	Changes made to the text since lastly pressing a function key are ignored.
RIGHT +n	3	The display will be scrolled right by the given number of columns.
SAVE	3	The text will be saved to file.
SDL +n	3	Text will be shifted left beginning with the first displayed column. Any text left of the first displayed column remains unchanged.
SDR +n	3	Text will be shifted right beginning with the first displayed column. Any text

		left of the first displayed column remains unchanged.
TOP	1	The top of the text will be displayed.
UP +n	2	Scroll the given number of lines upward.

Fig. 34: Text editor commands

Textarea The text area is used to enter the text data. Text will be displayed or can be edited according to the currently active state. A number of reserved strings can be used for special functions. These are treated as variables that will be replaced with runtime values while printing.

The following table lists these variables:

Variable	Description
&DATE	The current date will be inserted according to the active date format.
&SYST	The name of the system from which the print out was originated. Under PrintEx this variable is replaced with the name of the XPSDaemon ACB.
&TIME	The current time will be inserted.

Fig. 35: Text editor variables

One must ensure that there will be enough free space in the text to be used by a resolved variable. If this is not the case, part of the resolved variable will be overwritten with data from the text. If, e. g., the date is to be inserted and this will need 10 characters in the resulting text, the '&DATE' variable should be followed by at least 5 blanks in order to reserve enough space for the resolved date at runtime.

Command lines Command lines can be used to insert commands only for specific lines of text.

In the following table the '+n' extension indicates that the command can be executed with an additional decimal value. If this is desired the decimal value has to prefix or suffix the command without any separation.

A number of commands affect a block of subsequent lines. For these the beginning and the end of the block of lines have to be indicated with the block command. Block commands can only affect lines on the displayed page. The copy/move stack is able to contain up to 16 lines of text. The last content of the copy/move stack will be available until the display of the text index is left. This makes it possible to copy data from one text into another. Any number of line commands to fill the copy/move stack may be entered on one page. A subsequent command affecting the copy/move stack will force the current content of the copy/move stack to be deleted.

The following table shows the available line commands.

Command	Description
/	The selected line will become the first line in the display.
A	The content of the copy/move stack will be inserted after the selected line.
B	The content of the copy/move stack will be inserted before the selected line.

C+n	Beginning with the selected line, 'n' lines of text will be copied to the copy/move stack.
CC	The selected line marks either the beginning or the end of a text area about to be copied to the copy/move stack.
D+n	Beginning with the selected line, 'n' lines of text will be deleted.
DD	The selected line marks either the beginning or the end of a text area about to be deleted.
I+n	'n' empty lines will be inserted after the selected line.
M+n	Beginning with the selected line, 'n' lines of text will be moved to the copy/move stack.
MM	The selected line marks either the beginning or the end of a text area about to be moved to the copy/move stack.
R+n	The selected line will be repeated 'n' times.
SL+n	Beginning with the first displayed column the line data will be shifted left by 'n' columns. Line data left of the first column will not be affected.
SR+n	Beginning with the first displayed column the line data will be shifted right by 'n' columns. Line data left of the first column will not be affected.

Fig. 36: Text editor line commands

Code Pages

PrintEx needs country specific code pages for the translation of print output data from EBCDIC to ASCII/OEM/ANSI.

During installation, code pages for most of the European countries as well as for the US will be copied to the index of available code pages.

Choosing the menu option '7 Code Pages' will lead to the screen mask shown below.

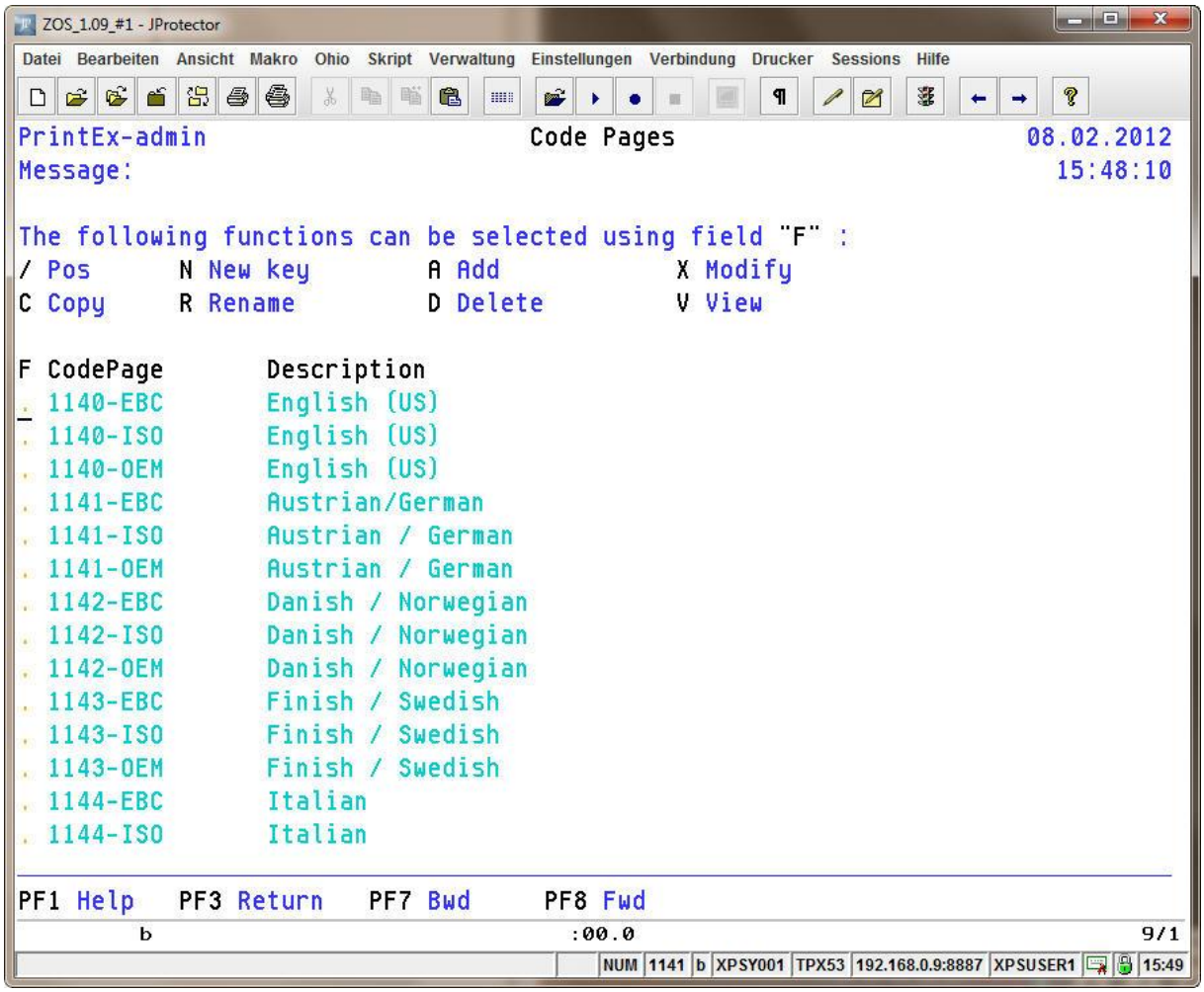


Fig. 37: Code Pages

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

Description of the fields

F	Choice box for one of the functions listed in the screen mask header.
CodePage	Name of the code page (max. 8 characters long).
Description	A description of the code page with up to 20 characters.

Function selection

Field 'F' can be used to choose one of the functions listed in the screen mask header.

/	**Pos**

The display will be rearranged moving the selected entry to the top of the list.

N	**New key**

Using this function a new entry can be selected to be moved to the top of the list.

To achieve this, a window for the input of the new start position is displayed. The input will be processed as a generic name. That is, the first entry found greater or equal to the input name will become the first entry in the list.

R	**Rename**

The selected entry can be renamed using function 'R'.

For the purpose of documentation the current name of the entry will be displayed in the entry mask where the new entry name can be specified. The chosen entry will only be renamed if the newly specified name is unique.

The length of the name of a code page may not exceed 8 characters.

D	**Delete**

The selected code page can be deleted using function 'D'.

After confirmation by pressing the Enter key the selected entry will be deleted from the code pages index. For the purpose of documentation the name of the entry about to be deleted will be displayed in the window asking for the delete confirmation.

All other functions for maintenance of the code pages use the following screen mask:

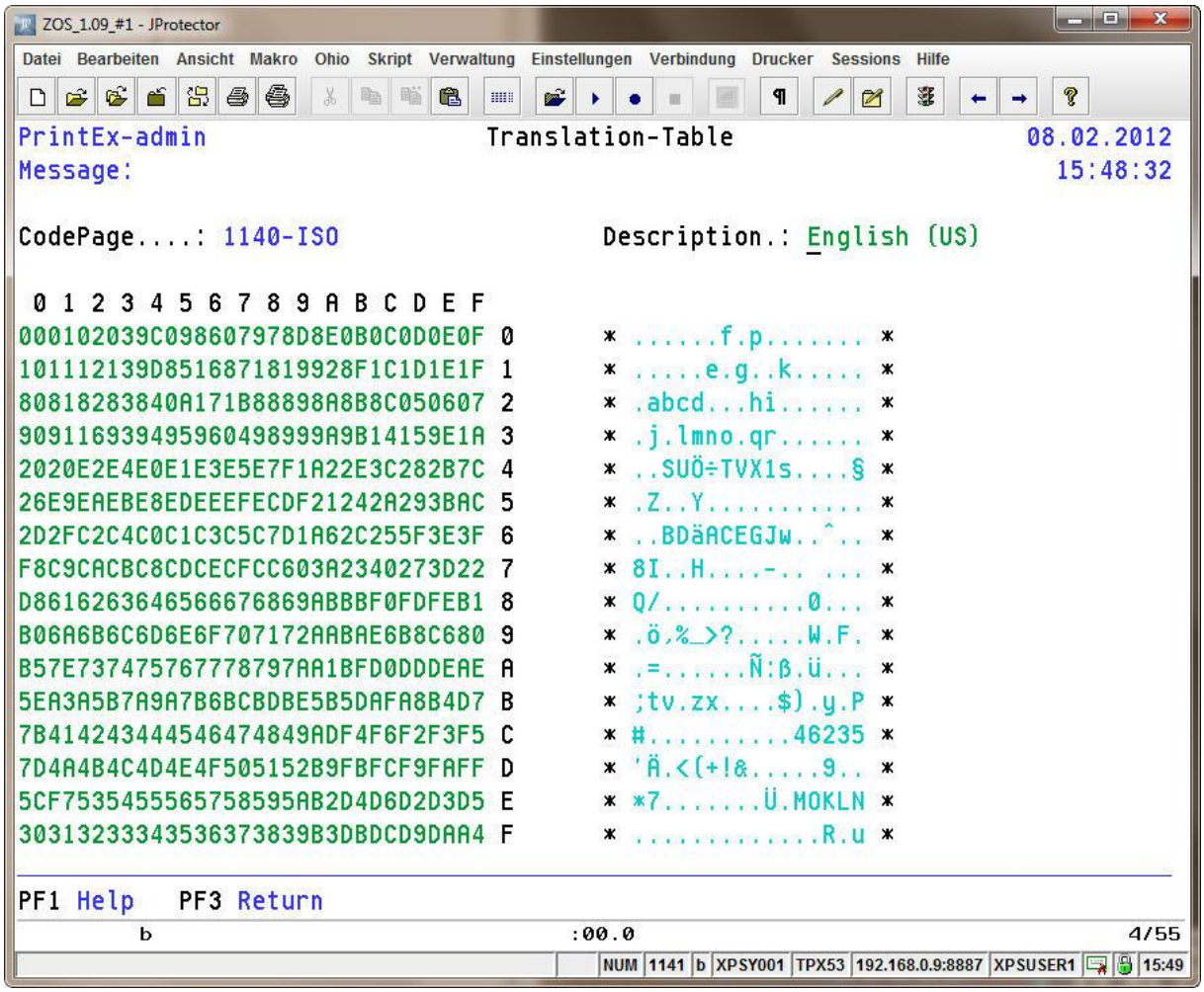


Fig. 38: Create, change and copy code pages

Function key assignments

PF1 Display the online help.

PF3 Return to the code pagtes index.

Description of the fields

CodePage This is the key for the new code page definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for this field is required.

Description This field can be used for an optional description of the code page with up to 20 characters.

00-FF This table is used for input of the ASCI/OEM/ANSI character to be used to translate the associated character from the EBCDCI character set.

Function selection

X	**Modify**

Existing code pages can be modified using function 'X'. Selecting this function will display the input screen mask shown above.

The screen mask will contain the definitions previously made for the code page which can be modified by overwriting them.

C Copy

An existing code page definition can be copied using function 'C'.

V View

Choosing the function 'V' will display the selected code page in the screen mask used to edit and modify a code page. Changes cannot be made to the displayed code page in view mode.

AFP Definitions

In order to process AFP print data, PrintEx will need standard values for the code page and for Chars, Formdef and Pagedef respectively if these values are not defined via JCL for a spool file.

Furthermore the AFP libraries for Formdefs, Pagedefs, Pagesegs, Fontdefs, Overlays and temporary files must be known as well as the USS path to the converter program 'afp2any'.

Choosing the menu option '8 AFP Definitions' will lead to the screen mask shown below.

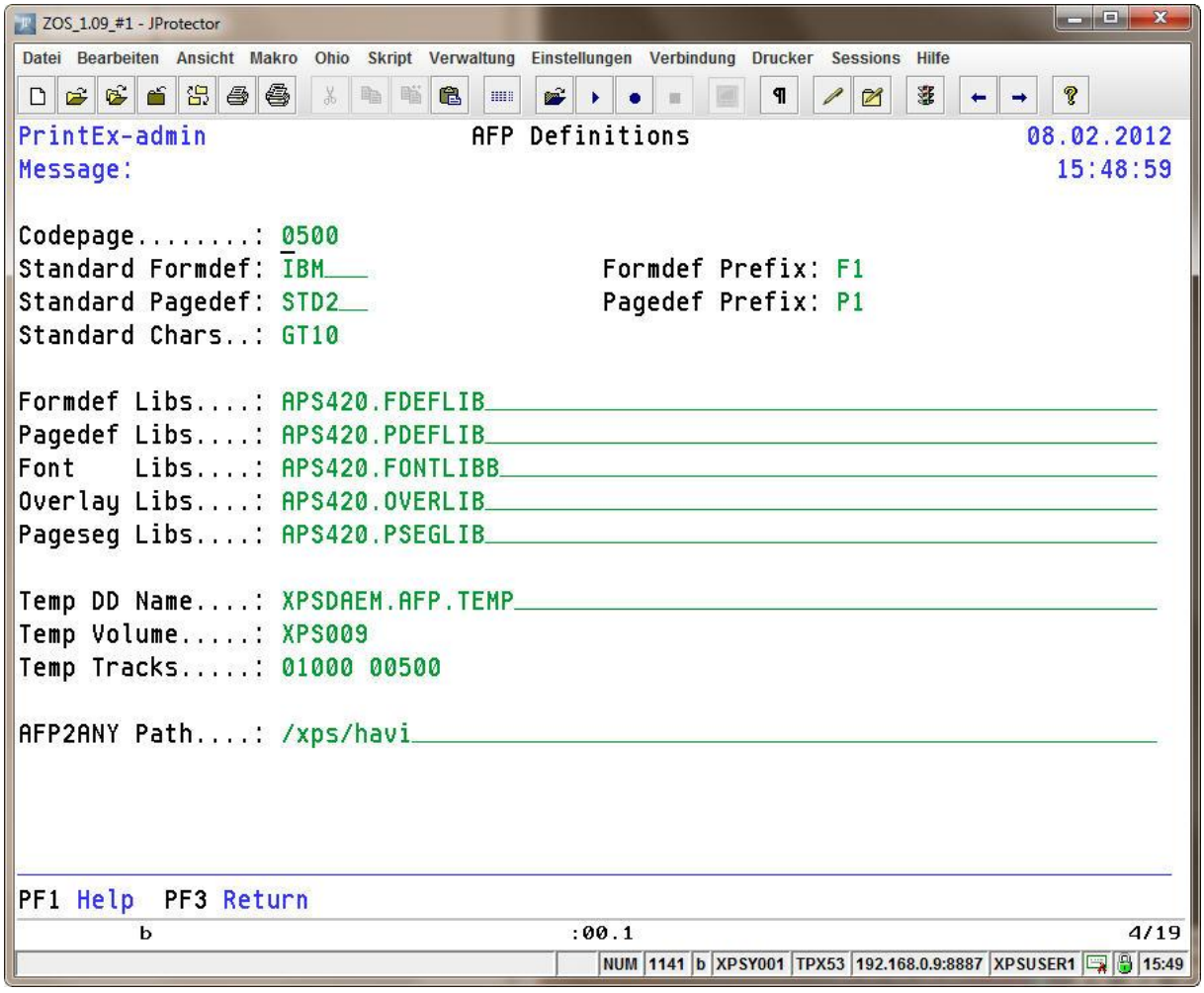


Fig. 39: AFP Definitions

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

Description of the input fields

Codepage This field is used to define a valid code page registered by IBM to be used for the translation of data into the AFP format (default = 500).

Standard Formdef When transforming data into the AFP format, PrintEx will use the 'Formdef' definition 'FORMDEF=' found in JCL. If this JCL option is absent PrintEx will use the standard 'Formdef' defined with this option.

Formdef Prefix This field is used to define the two-character prefix used to locate the 'Formdef' in the 'Formdef' library.

Standard Pagedef When transforming data into the AFP format, PrintEx will use the 'Pagedef' definition 'PAGEDEF=' found in JCL. If this JCL option is absent PrintEx will use the standard 'Pagedef' defined with this option.

Pagedef Prefix This field is used to define the two-character prefix used to locate the 'Pagedef' in the 'Pagedef' library.

Standard Chars When transforming data into the AFP format, PrintEx will use the 'Chars' definition 'CHARS=' found in JCL. If this JCL option is absent PrintEx will use the standard 'Chars' defined with this option.

Formdef Libs This field is used to make known the DD name of the 'Formdef' library. Multiple libraries can be defined separated with commas.

Pagedef Libs This field is used to make known the DD name of the 'Pagedef' library. Multiple libraries can be defined separated with commas.

Font Libs This field is used to make known the DD name of the 'Font' library. Multiple libraries can be defined separated with commas.

Overlay Libs This field is used to make known the DD name of the 'Overlay' library. Multiple libraries can be defined separated with commas.

Pageseg Libs This field is used to make known the DD name of the 'Pageseg' library. Multiple libraries can be defined separated with commas.

Temp DD Name PrintEx needs some temporary files in the context of transforming print output to AFP. This field is used to define the DD name prefix for these temporary files. PrintEx will delete all temporary files after job termination.

Temp Volume PrintEx needs some temporary files in the context of transforming print output to AFP. This field is used to define the volume for these temporary files.

Temp Tracks PrintEx needs some temporary files in the context of transforming print output to AFP. This field is used to define the size in tracks of these temporary files. The value chosen should be big enough to make possible the processing of the biggest spool file to be converted plus any needed resources.

AFP2ANY Path PrintEx makes use of the program 'afp2any' in order to transform AFP data to PostScript or to PDF. The 'afp2any' program can be called either as a USS program or as a program running under the control of a network server component from XPS such as XPSTransit or XPS HostDrive/J.

This field is used to define either the full qualified USS path to the 'afp2any' program or to define a TCP/IP server/port combination observed by one of the mentioned XPS server components for incoming requests to launch the 'afp2any' program. In the latter case the definition has to be prefixed with the 'IP:' identifier such as 'IP:192.168.0.111:515'.

System Parameters

During installation PrintEx defines standard values for the various system parameters.

Choosing the menu option 'A System Parameters' will lead to the screen mask shown below which allows the maintenance of the settings for the system parameters.

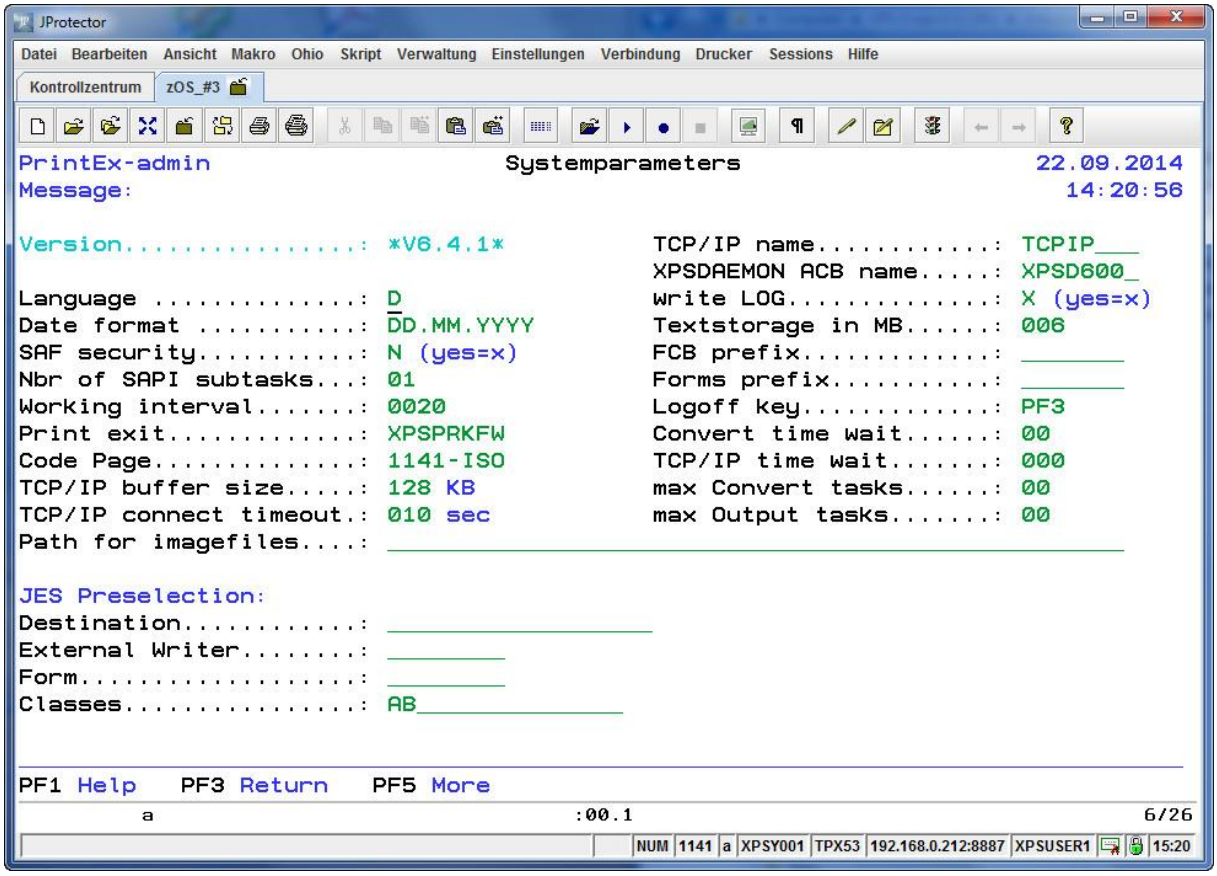


Fig. 40: System Parameters

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF5 Display the second page of the system parameters.

Description of the input fields

Version This field displays the currently used PrintEx version.

Language This field is used to select the global PrintEx language character. To make possible the selection of a specific language, a message module named 'XPSV?SG' needs to be present where the placeholder character '?' will be exchanged with the input in this field. The default installation is 'D' for German ('XPSV**D**SG').

Changes made to this option will immediately become active.

Date format

This is the pattern format for the display of the system date. The paragraph sign '§' can be used to insert blanks into the date format. 'D' stands for the day value, 'M' for the month value and 'Y' for the year value. Each placeholder stands for exactly one character.

Changes made to this option will immediately become active.

SAF security

If this option is selected ('X') PrintEx will use z/OS's SAF router to validate the name/password combination typed in by the user during sign on to the PrintEx administrator environment. This allows the name/password combination to be verified by the standard security system installed on z/OS – e. g. IBM RACF or CA Top Secret.

Changes made to this option will immediately become active.

Nbr of SAPI subtasks

The JES2/JES3 spool system notifies PrintEx every time print output is available that matches the PrintEx pre-selection criteria. Print output will then be processed by PrintEx immediately. Internally the availability of print output will lead to the execution of a PrintEx SAPI job which is, technically spoken, a separate MVS subtask in the PrintEx region. If it is desired that PrinEx, if necessary, processes more than one print output simultaneously, more SAPI subtasks need to be available. This can be achieved by using this field to specify a larger number of SAPI subtasks than the default value of one.

Changes made to this option will become active on the next PrintEx start.

Working interval

If PrintEx receives print output for a destination that is currently started but busy, PrintEx will repeatedly try to deliver the print output to the destination after the interval in seconds specified with this option has elapsed.

Changes made to this option will immediately become active.

Print exit

PrintEx makes it possible at various points of execution to influence the processing sequence and to change the print output data. This is carried out using installation specific print exit programs. The following table lists the points of exection at which print exit programs will receive control.

'1' after data has been read from the JES spool or from VTAM
'2' before data will be converted by PrintEx
'3' after data has been converted by PrintEx
'4' after generation of the file name – file destination, only
'5' after destination selection

If one or more of the specified exit points are to be used, the name of the print exit program which may not exceed 8 characters has to be specified in this field.

A more detailed description of the print exit can be found in chapter '6 - Print Exit' on page 149.

Changes made to this option will immediately become active.

Code Page

This is the code page to be used for standard conversions.

TCP/IP buffer size

This field is used to define the standard TCP/IP buffer size. This buffer size is used for all destinations for which an own TCP/IP buffer size is not defined.

TCP/IP name This is the job name of the TCP/IP system to be used by PrintEx.

XPSDaemon ACB name This is the VTAM ACB name of the PrintEx carrier XPSDaemon.

write LOG By inserting 'X', this field can be used to globally activate the PrintEx protocol for all printers.

Textstorage in MB For the purpose of increased performance PrintEx will hold copies of prefix and suffix texts in main storage. Using this field, the size of the main storage to be reserved for this purpose can be specified. If the reserved amout of main storage does not suffice to contain all used prefix and suffix texts, PrintEx will remove those texts from main storage not used for the longest time and will reload them on demand.

FCB prefix To make destination names variable, PrintEx can be instructed to use the FCB name of a spool file as PrintEx model. This can be achieved by defining '&FCB' or '&FCBFORM' for the model name in the context of a destination definition. The FCB prefix defined here – if any - will be used as prefix for the spool file's FCB name in order to build the resulting name of the model to use.

Forms prefix By defining '&FCBFORM' as model name, PrintEx can be instructed to use the FCB name of a spool file as a destination's model, thus making model selection flexible. Furthermore the 'Forms' name will be used as key for an additional prefix text. The Forms prefix defined here – if any - will be used as prefix for the spool file's FORMS name in order to build the name of the additional prefix text.

Logoff key This option is used to define the logoff key for the PrintEx online administration. The default is 'PF3'.

Convert time wait If any value bigger than '00' is specified for this option, PrintEx will interrupt the conversion of spool files for the specified number of seconds after processing of each segment of the spool file.

Note: Specifying a value for this option will decrease PrintEx performance noticeably. Therefore a value should only be specified if PrintEx consumes too much CPU time.

TCP/IP time wait Normally LPD printers send a positive response after all print data has been processed. There might be situations where the printer does not send a positive response. If that is the case, PrintEx will flag the printer as busy and thus the printer will not be available for further printing.

In order to avoid this, PrintEx can be instructed to free the printer for further printing after the number of seconds specified in this field has elapsed. If '000' is specified, PrintEx will never release the printer for further printing unless the printer has sent a positive response after all print data has been processed.

max Convert tasks This field can be used to limit the maximum number of conversions to be done by PrintEx simultaneously.

If '00' is specified, PrintEx will try to immediately launch a convert task as soon as data to be converted is available.

max Output tasks This field can be used to limit the maximum number of TCP/IP connections to be opened by PrintEx simultaneously for the purpose of print data transmission.

If '00' is specified, PrintEx will try to immediately transmit converted print data to the defined destination.

Path for imagefiles If imagefiles such as JPEGs or Tiffs are to be stored in OMVS, this field can be used to set a standard store location path. Other definitions that include OMVS images can then use the placeholder '&PATH' instead of the fully qualified path in order to refer to OMVS images.

JES Preselektion PrintEx and the JES2/JES3 spool are linked via the SAPI subsystem (SYSOUT API). During start up, when PrintEx registers at the SAPI subsystem, various pre-selection criteria can be made known to SAPI. Afterwards SAPI will notify PrintEx about available SYSOUT lists only if the lists match the assigned pre-selection criteria. This will reduce the communication between JES and PrintEx to the needed minimum.

Pre-selection criteria, as defined with the following options, can contain the asterisk '*' and the question mark '?' as placeholders. The '*' can be used to represent a random number of coniguous characters while the '?' can be used to represent exactly one character.

In order for any JES definition as defined in chapter '

JES Definitions' on page 30 to be recognized it has to be firstly recognized by the pre-selections defined with the following options.

Changes made to the following pre-selection options will become active on the next PrintEx start.

Destination This field can be used to define a single destination as pre-selection. Generic input such as 'TCP*' is allowed. If no definition is made, no pre-selection based on the destination will be made.

External Writer This field can be used to define a single external writer as pre-selection. Generic input such as 'TCP*' is allowed. If no definition is made, no pre-selection based on the JES external writer will be made.

Form This field can be used to define a single form as pre-selection. Generic input such as 'FRM*' is allowed. If no definition is made, no pre-selection based on the form will be made.

Classes This field can be used to define up to 16 JES output classes as pre-selection, such as 'ABC'. If no definition is made, no pre-selection based on the JES output classes will be made.

Pressing the PF5 key results in the display of the second screen page of the system parameters definitions as shown below:

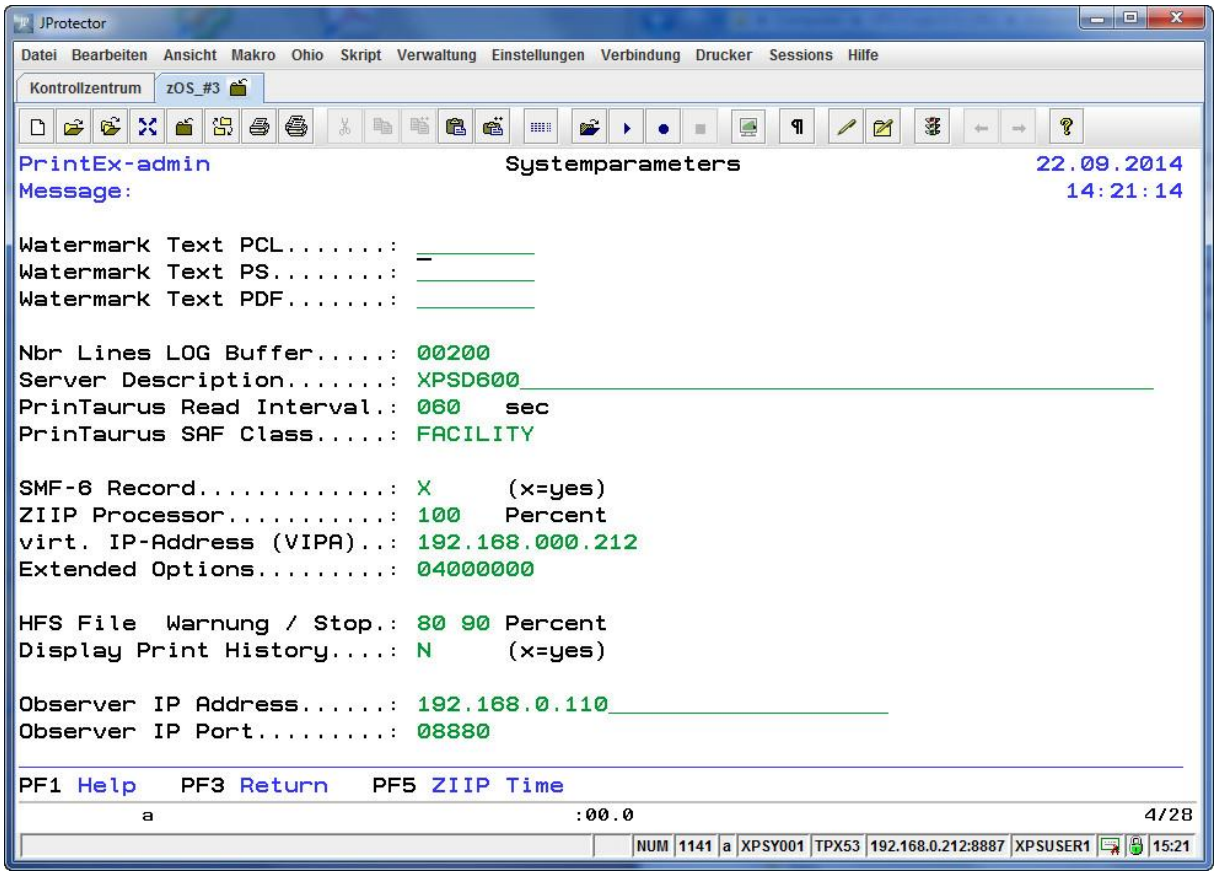


Fig. 41: System Parameters – Page 2

Function key assignments

PF1 Display the online help.

PF3 Return to the first page of the system parameter definitions.

PF5 Display the current state of ZIIP processor use.

Description of the input fields

Watermark Text PCL This option can be used to specify a PrintEx text member containing a watermark text to be printed for PCL output. The text has to be created using option '6 Text Definitions' from the PrintEx menu. E. g. a watermark string can be used to identify print output from a test system.

Watermark Text PS This option can be used to specify a PrintEx text member containing a watermark text to be printed for Postscript output. The text has to be created using option '6 Text Definitions' from the PrintEx menu. E. g. a watermark string can be used to identify print output from a test system.

Watermark Text PDF This option can be used to specify a PrintEx text member containing a watermark text to be printed for PDF output. The text has to be created using option '6 Text Definitions' from the PrintEx menu. E. g. a watermark string can be used to identify print output from a test system.

Nbr. Lines LOG Buffer This option can be used to specify the number of lines of the PrintEx log to be held incore. Possible values lie in the range between 100 and 65535. PrinTaurus administrators connected with PrintEx can display PrintEx log lines up to the number of lines specified with this option.

Server Description This option can be used to give a short description for the PrintEx server that will be displayed to a PrinTaurus administrator connected with PrintEx.

PrinTaurus Read Interval This option can be used to specify an interval of seconds after which PrinTaurus will ask PrintEx to return the current runtime state to be displayed to the PrinTaurus administrator. The maximum value permitted is '255'. If '0' is specified PrintEx status updates will be queried by PrinTaurus based on the interval value specified by the PrinTaurus administrator.

PrinTaurus SAF Class PrintEx can limit the amount of functionality granted to a PrinTaurus administrator using RACF/SAF. To do so a specific SAF class has to be defined whose name has to be made known to PrintEx using this option. The following table lists the RACF profile entries queried by PrintEx:

Profileentry	Description
`PRINTEX.ADMIN.SYSTEM`	The user is permitted to administer the PrintEx system parameters.
`PRINTEX.ADMIN.USER`	The user is permitted to administer PrintEx user definitions.
`PRINTEX.ADMIN.QUEUE`	The user is permitted to administer PrintEx selection criteria.
`PRINTEX.ADMIN.DEST`	The user is permitted to administer PrintEx print output destinations.
`PRINTEX.OPER.JOB`	The user is permitted to administer PrintEx printer jobs.
`PRINTEX.OPER.ARCHIVE`	The user is permitted to administer the PrintEx documents

	archive.

In order to check for granted permissions PrintEx makes use of the user identification provided by the PrinTaurus administrator during logon to PrintEx. If this option is not used PrintEx will use its internal user profiles for permission checks.

SMF-6 Record This option can be used to notify PrintEx to write a unique SMF-6 record for each spool file delivered.

ZIIP Processor PrintEx is able to delegate CPU intensive processing such as list conversions to cost-efficient ZIIP processors in case these are provided by the underlying hardware. Using this option the maximum value of PrintEx's use of these ZIIP processors can be specified in percent.

Virt. IP-Address (VIPA) This option can be used to specify a TCP/IP address on the running machine to be bound by PrintEx's TCP/IP listener. If this option is not specified the TCP/IP address to be bound will be chosen by TCP/IP. This option is especially useful in systems owning more than one TCP/IP addresses.

Extended Options This option can be used to specifiy extended PrintEx processing options on demand.

HFS File Warning PrintEx uses an own VSAM RRDS based HFS file to store printout data and other informations. This option can be used to notify PrintEx about the file's fill level in percent triggering the output of warning messages regarding the fill level to the system log.

HFP File Stop This option can be used to specify the HFS file's fill level in percent prohibiting PrintEx from processing newly arriving documents. It's to consider that PrintEx needs some amount of file space during document processing. Even when the file stop level has been reached PrintEx will continue to process and print out documents that are already waiting for delivery. If – during the process of printing documents – the amount of free space on the HFS file will increase and the warning fill level will be reached again PrintEx will continue to process newly arriving documents.

Display Print History If this option is activated with a 'X', completed print jobs will remain in the display of active print jobs for 30 more seconds.

Observer IP Address In cooperation with the product 'HostDrive' from XPS, PrintEx is able to write protocol entries about completed print jobs. In order to do so PrintEx transmits protocol information via TCP/IP to a listening HostDrive observer instance which will store the protocol information in a MongoDB. The protocol can be examined during run time using the HostDrive management application 'HostDriveWorks'. Later on specific protocols can be generated by executing queries against the HostDrive observer data base. If PrintEx shall participate in the HostDrive observer processing this option can be used to make known to PrintEx the TCP/IP address of the server machine running the HostDrive observer.

Observer IP Port If PrintEx shall patricipate in the HostDrive observer processing this option can be used to notify PrintEx about the TCP/IP port monitored by HostDrive for incoming observer entries.

User Definitions

All users permitted to administer PrintEx must be defined using menu option 'B User Definitions'. Choosing this menu option will lead to the screen mask shown below.

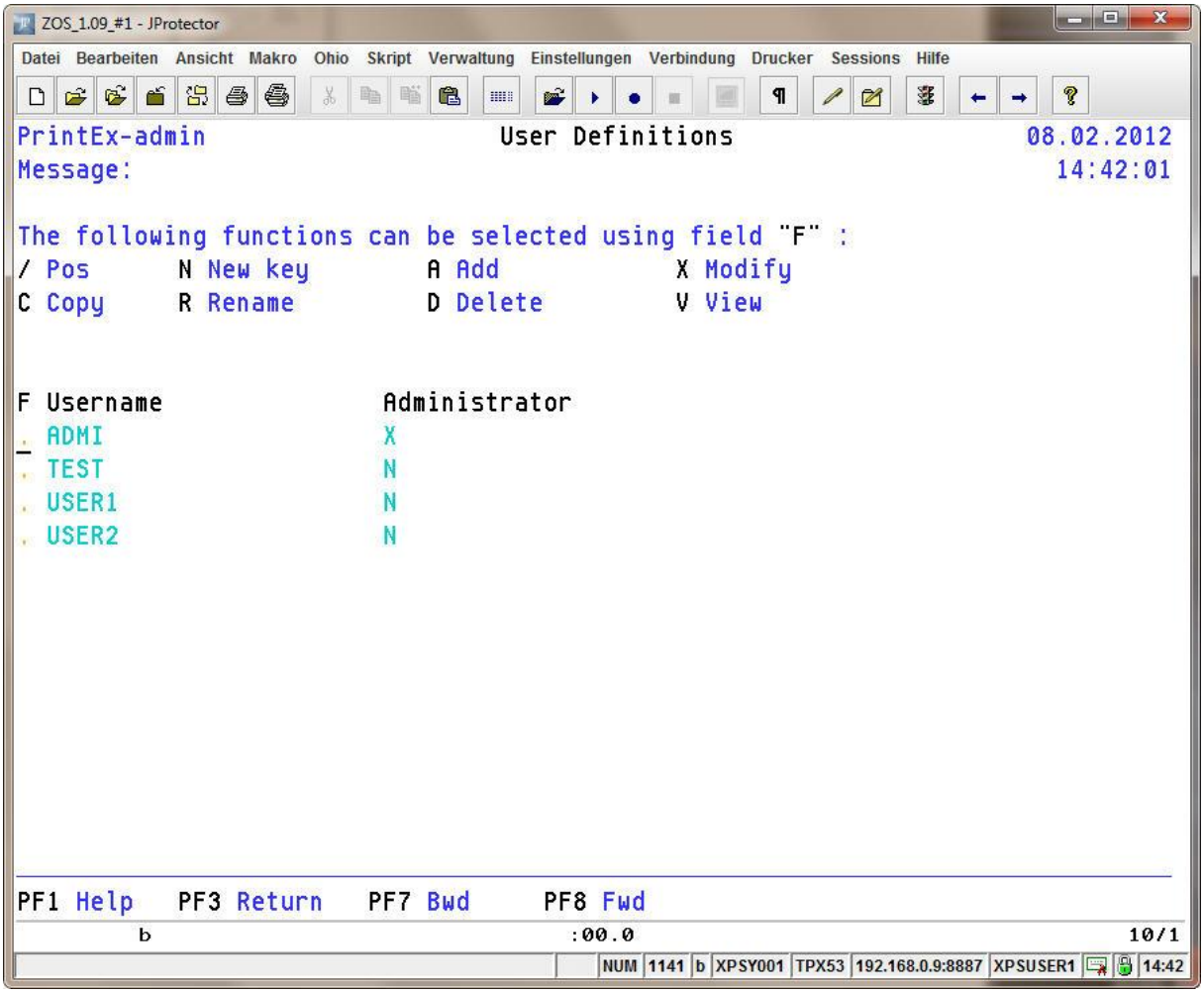


Fig. 42: User Definitions

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

Description of the fields

F Choice box for one of the functions listed in the screen mask header.

Username Name of the user (max. 20 characters long).

Administrator An 'X' indicates that the user has been granted administrator rights.

Function selection

Field 'F' can be used to choose one of the functions listed in the screen mask header.

/	**Pos**

The display will be rearranged moving the selected entry to the top of the list.

N	**New key**

Using this function a new entry can be selected to be moved to the top of the list.

To achieve this, a window for the input of the new start position is displayed. The input will be processed as a generic name. That is, the first entry found greater or equal to the input name will become the first entry in the list.

R	**Rename**

The selected entry can be renamed using function 'R'.

For the purpose of documentation the current name of the entry will be displayed in the entry mask where the new entry name can be specified. The chosen entry will only be renamed if the newly specified name is unique.

The length of a user name may not exceed 20 characters. The user name and the password will be used to identify the user when logging on to PrintEx.

D	**Delete**

The selected user entry can be deleted using function 'D'.

After confirmation by pressing the Enter key the selected entry will be deleted from the user index. For the purpose of documentation the name of the entry about to be deleted will be displayed in the window asking for the delete confirmation.

All other functions for maintenance of the user entries use the following screen mask:

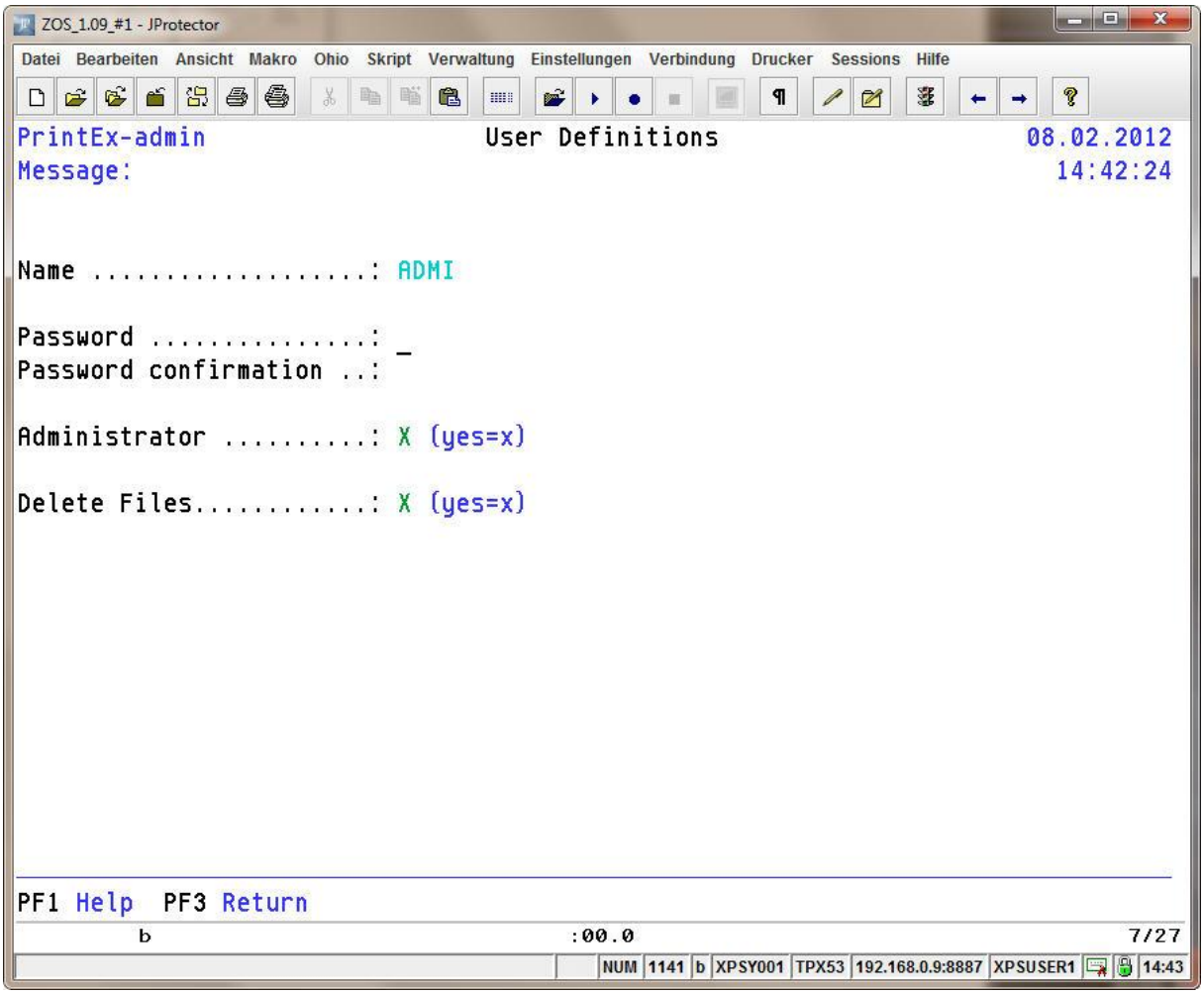


Fig. 43: Create, change and copy user entries

Function key assignments

PF1 Display the online help.

PF3 Return to the user index.

Function selection

A	**Add**

New entries can be created using function 'A'. The screen mask previously displayed is used to define the user data.

Description of the input fields

Name

This is the key for the new user definition. The key has to be unique, must not exceed a length of 20 characters, may contain only alphanumeric characters and can be generically shortened using the '*' character.

The user will be required to enter the user name in order to be identified when signing on to PrintEx.

Input for this field is required.

Password This is the user's password which must not exceed a length of 8 characters. While typing in the password it will be hidden.

Password confirmation This is the confirmation of the user's password, which will be hidden as well. The input will be accepted only if the contents of both password fields are identical.

Administrator In order to grant a user administrator rights an 'X' has to be input in this field. Users who do not have administrator rights are only allowed to administer the print queue.

Delete files If an 'X' is specified in this field, the user will be allowed to delete entries from the XPS spool file.

Function selection

X	**Modify**

Existing user entries can be modified using function 'X'. Selecting this function will display the input screen mask shown in Fig. 43 on page 115.

The screen mask will contain the definitions previously made for the user which can be modified by overwriting them.

C	**Copy**

Existing user definitions can be copied using function 'C'.

V	**View**

Choosing the function 'V' will display the selected user entry in the screen mask used to edit and modify a user entry. Changes cannot be made to the displayed user entry in view mode.

Storage Control

During installation PrintEx allocates default values for storage control. These values can be changed in order to meet installation requirements more precisely using menu option 'C Storage Control'.

This will lead to the screen mask shown below.

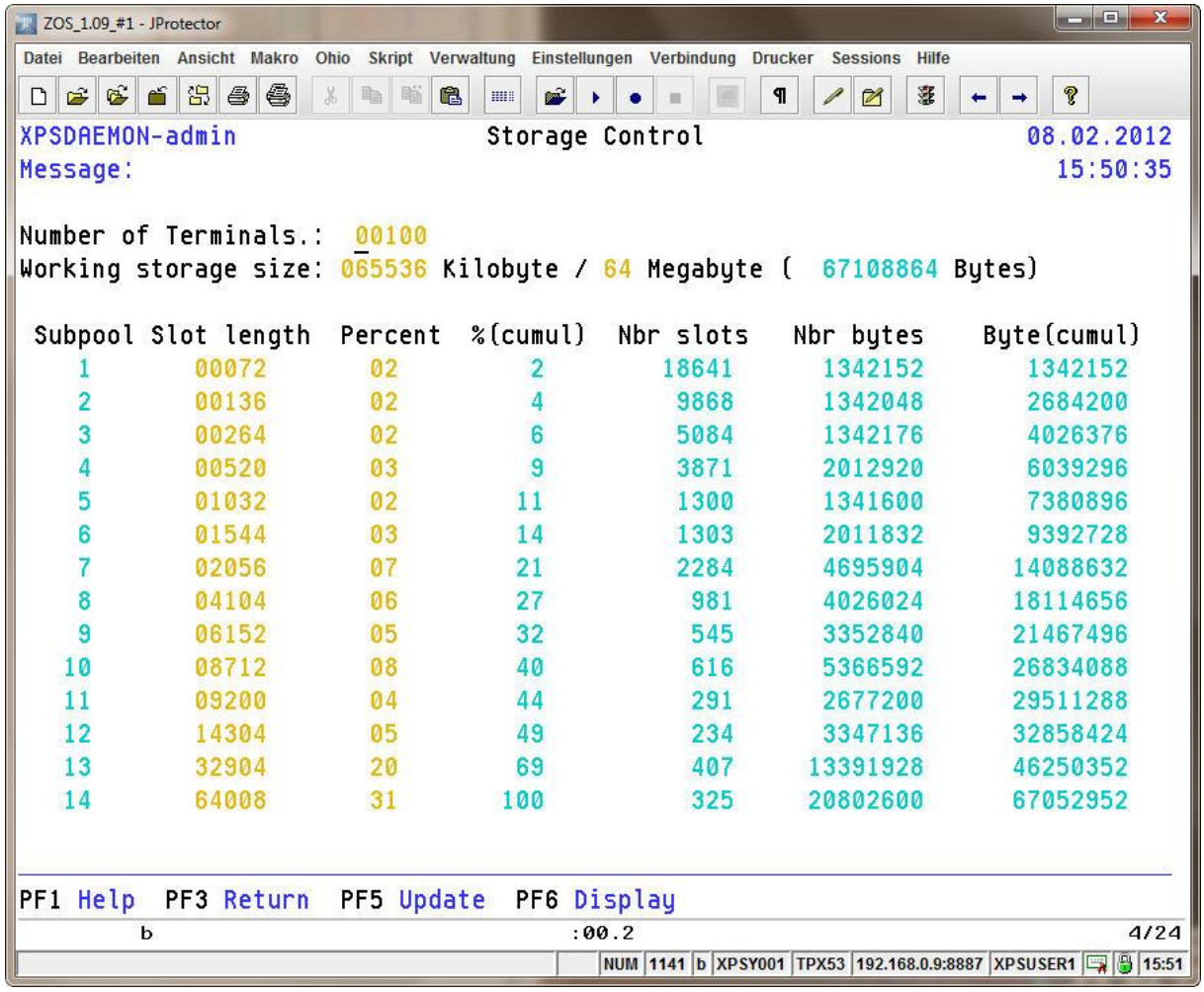


Fig. 44: Storage Control – pool definitions

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF5 Save the defined values.

PF6 Display runtime information.

Description of the input fields

Number of Terminals PrintEx needs a specific amout of system storage for every printer in order to maintain runtime information for the printer. This field is to be used to make known to PrintEx the estimated number of printers about to be controlled by PrintEx. During startup PrintEx calculates the size of the needed system storage for this number of printers and allocates the storage in the PrintEx region. If the number of printers exceeds the estimated value, PrintEx will allocate overflow storage using the GETMAIN macro in order to create the required system tables for the printers.

Working storage size Storage allocation requests made by PrintEx and its sub components will be satisfied, if possible, from the pool of working storage defined with this option. The size of the working storage to be allocated during start up can be defined either in kilo bytes (first input field) or in mega bytes (second input field). The maximum possible values are 101376 kilo bytes or 99 mega bytes respectively. The last field in the line shows the size in bytes of the allocated working storage based on the definitions in the two other fields.

The defined working storage will be divided into subpools each providing storage slots of a unique length. Using the following input fields the slot-lengths as well as the percentage of the complete subpool relative to the defined working storage size can be defined.

Slot length This field is used to define the length of a single slot from the subpool. If necessary the input will be rounded to a multiple of 8. The various slot lengths must be defined in ascending order. The maximum acceptable slot length value is 65528. A value of 0 must not be specified. If a subpool shall not be used a percentage of 0 must be defined (see "Percent" below).

Percent Using this field the percentage of the size of the complete subpool relative to the defined working storage can be specified. All defined percent values must accumulate to 100. If a percent value of '0' is defined, the subpool will not be used.

All other fields display various information resulting from the input into the fields previously described.

Description of the fields

%(cumul) This fields shows the accumulated percent values up to the particular slot based on the current configuration. This makes adjustments more easy if, e. g., the message 'M873 Cumulated percent exceed 100' is issued.

Nbr slots This field shows the number of slots in the particular subpool resulting from the current values for percent, slot length and working storage size.

Nbr bytes This field shows the size in bytes of the single subpools based on the current configuration. The shown size is the result of the multiplication of the slot length and the number of slots.

Byte(cumul) This field shows the accumulated size in bytes up to the particulare slot based on the current configuration.

After pressing the Enter key the current configuration will be tested for correctness and consistency. An update, using the newly defined storage configuration, will be made to the PrintEx system file 'XPSVFIL' after PF5 key has been pressed. Changes will become active on the next PrintEx start.

In order to control the efficency of the chosen values for the number of terminals, the slot lengths and the percent values, PrintEx offers some runtime statistics showing the real storage use in the PrintEx region with regard to the various subpools. Based on the shown runtime values adjustments can be made to the number of terminals, the size of the working storage and the size of the single subpools in order to optimize the use of the working storage in the PrintEx region.

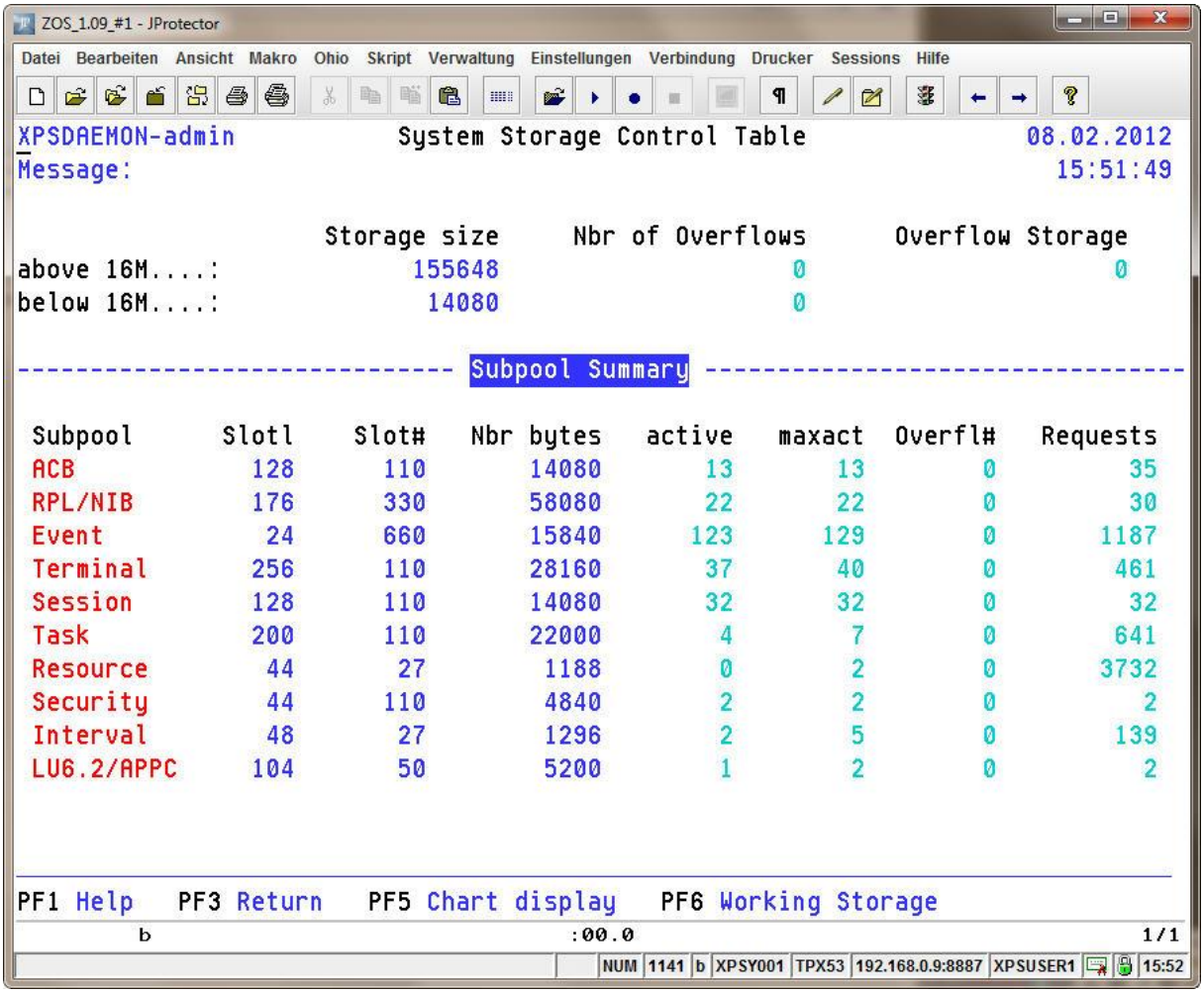


Fig. 45: Runtime statistics system storage

Function key assignments

PF1 Display the online help.

PF3 Return to the calling screen mask.

PF5 Display runtime information as bar chart.

PF6 Display runtime statistics for the working storage.

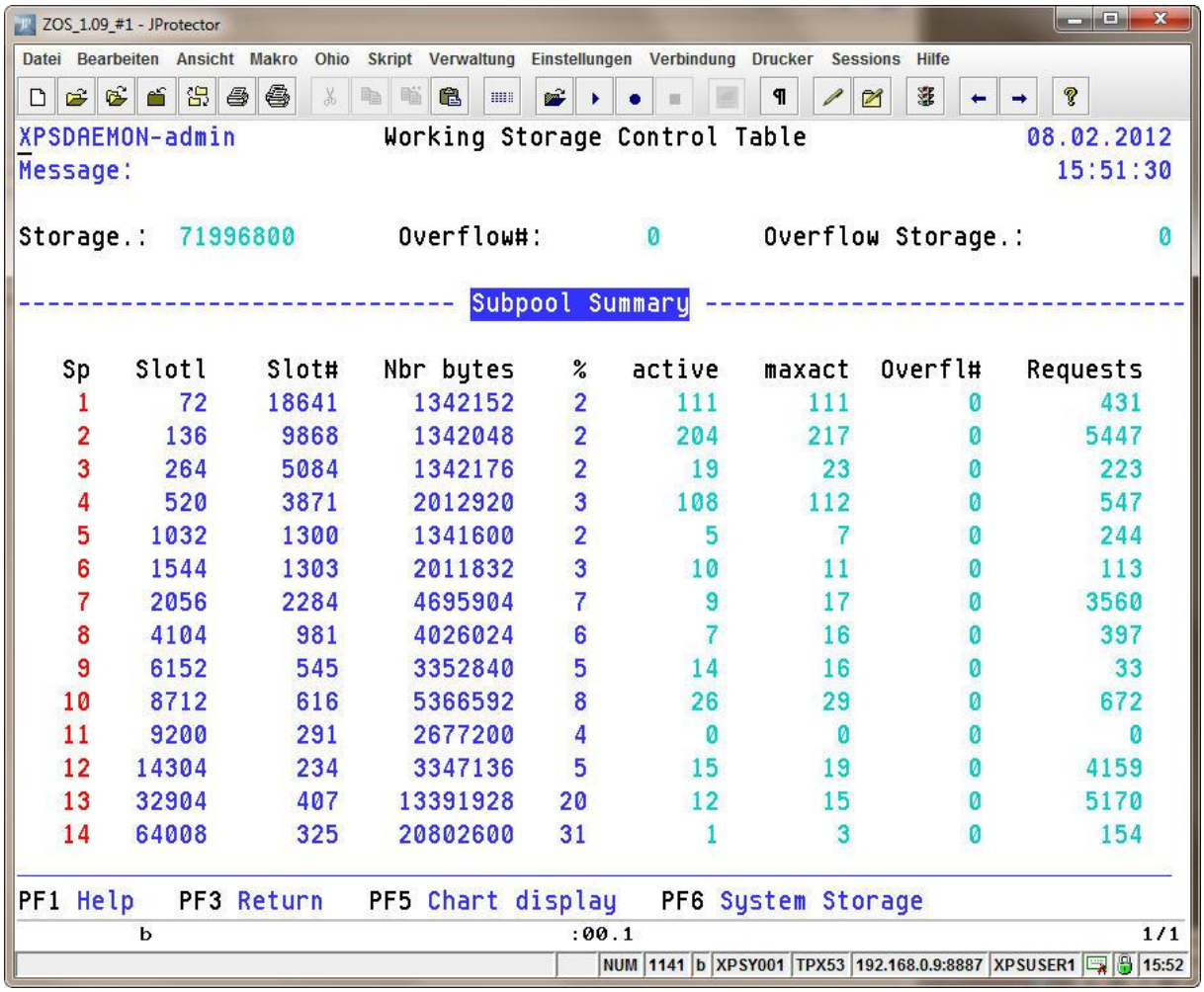


Fig. 46: Runtime statistics working storage

Function key assignments

PF1 Display the online help.

PF3 Return to the calling screen mask.

PF5 Display runtime information as bar chart.

PF6 Display runtime statistics for the system storage.

Spool Maintenance

Print data stored in the XPS spool can be printed anytime using spool maintenance.

Choosing the menu option 'D Spool Maintenacne' will lead to the screen mask shown below.

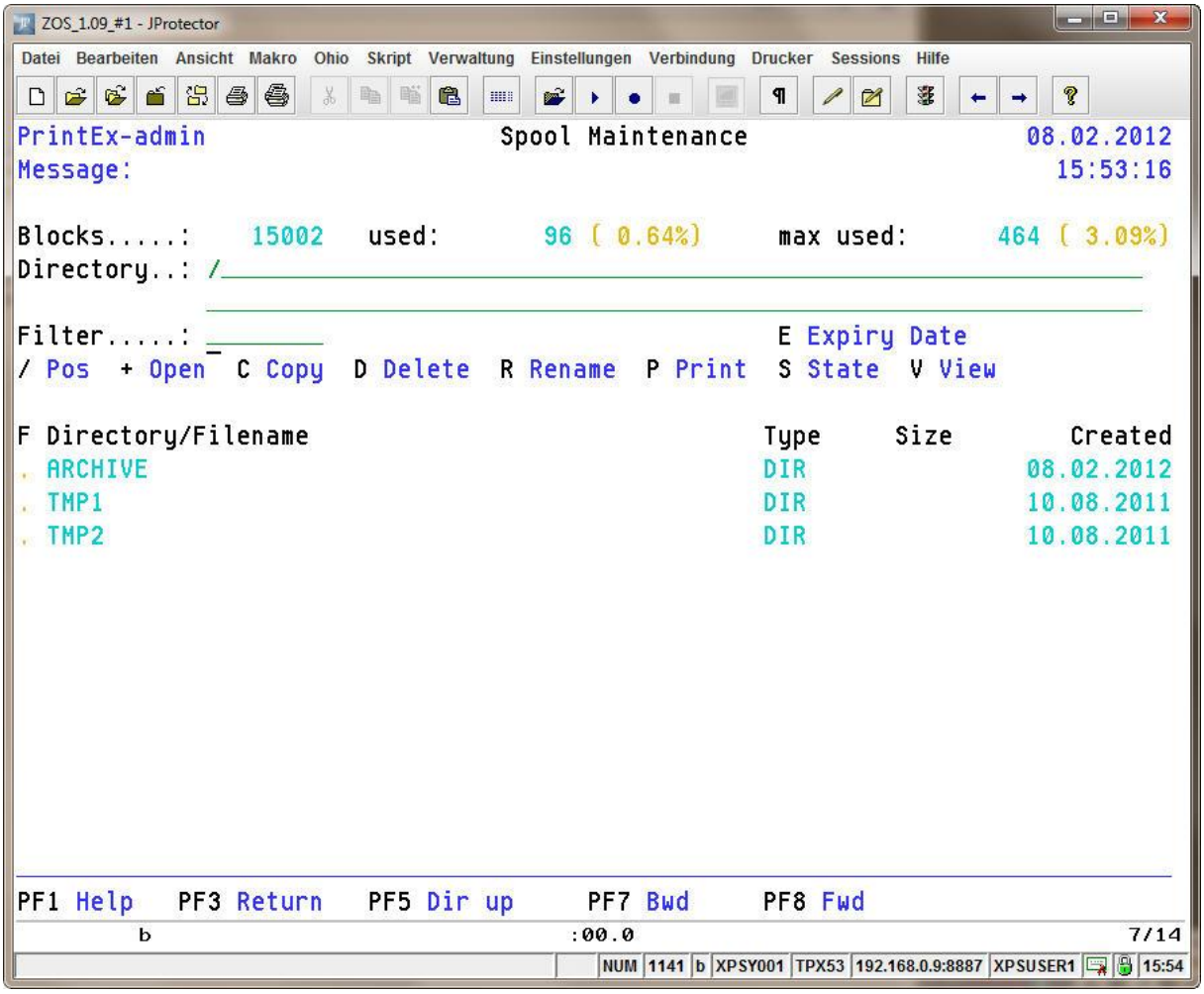


Fig. 47: Spool Maintenance

Function key assignments

PF1 Display the online help.

PF3 Return to the previous display. If the root directory has been reached the display will return to the PrintEx menu.

PF5 Go one level upwards in the hierarchical file display.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

Description of the fields

Blocks	This is the number of blocks of the PrintEx spool file (VSAM-RRDS). The number of blocks is defined in the context of the PrintEx installation.
used	This is the number of blocks currently used in the PrintEx spool file.
max used	This is the maximum number of blocks used in the PrintEx spool file at any time (high-water-mark).
Directory	This field shows the directory in the hierarchical spool file currently displayed.
Filter	This field can be used to set a display filter for the complete file key. If, for example, the filter string 'HPLASER' is defined, only those files having the destination 'HPLASER' will be displayed because of the fact that the destination is part of the file key.
F	Choice box for one of the functions listed in the screen mask header.
Directory/Filename	This column contains the table of contents of the currently displayed directory.
Type	This field shows the type of an entry. Possible types are 'DIR' (directory) or 'FILE' (file).
Size	For entries of type 'FILE' this field will display the file size.
Created	This field shows the creation date of the directory or the file.

Function selection

Field 'F' can be used to choose one of the functions listed in the screen mask header.

/ Pos

The display will be rearranged moving the selected entry to the top of the list.

+ Open

If '+' is entered in the function field of a directory the display will be updated to show the next sub directory containing at least two entries or, if such a directory cannot be found, the lowest level of the chosen directory will be displayed.

C Copy

Files and directories can be copied using function 'C'.

For the purpose of documentation the full qualified path to the entry to copy will be displayed in the entry mask where the new name can be specified.

D Delete

The selected entry can be deleted using function 'D'.

After confirmation by pressing the Enter key the selected entry will be deleted from the PrintEx spool file. For the purpose of documentation the name of the entry about to be deleted will be displayed in the window asking for the delete confirmation.

R	Rename

The selected entry can be renamed using function 'R'. The function is only available for files (TYP=FILE). Directories can not be renamed.

For the purpose of documentation the current name of the entry will be displayed in the entry mask where the new entry name can be specified. The chosen entry will only be renamed if the newly specified name is unique.

The length of the file name (including the complete path length) may not exceed 100 characters.

P	Print

A single file can be printed using function 'P'.

Choosing function 'P' will lead to the screen mask shown below.

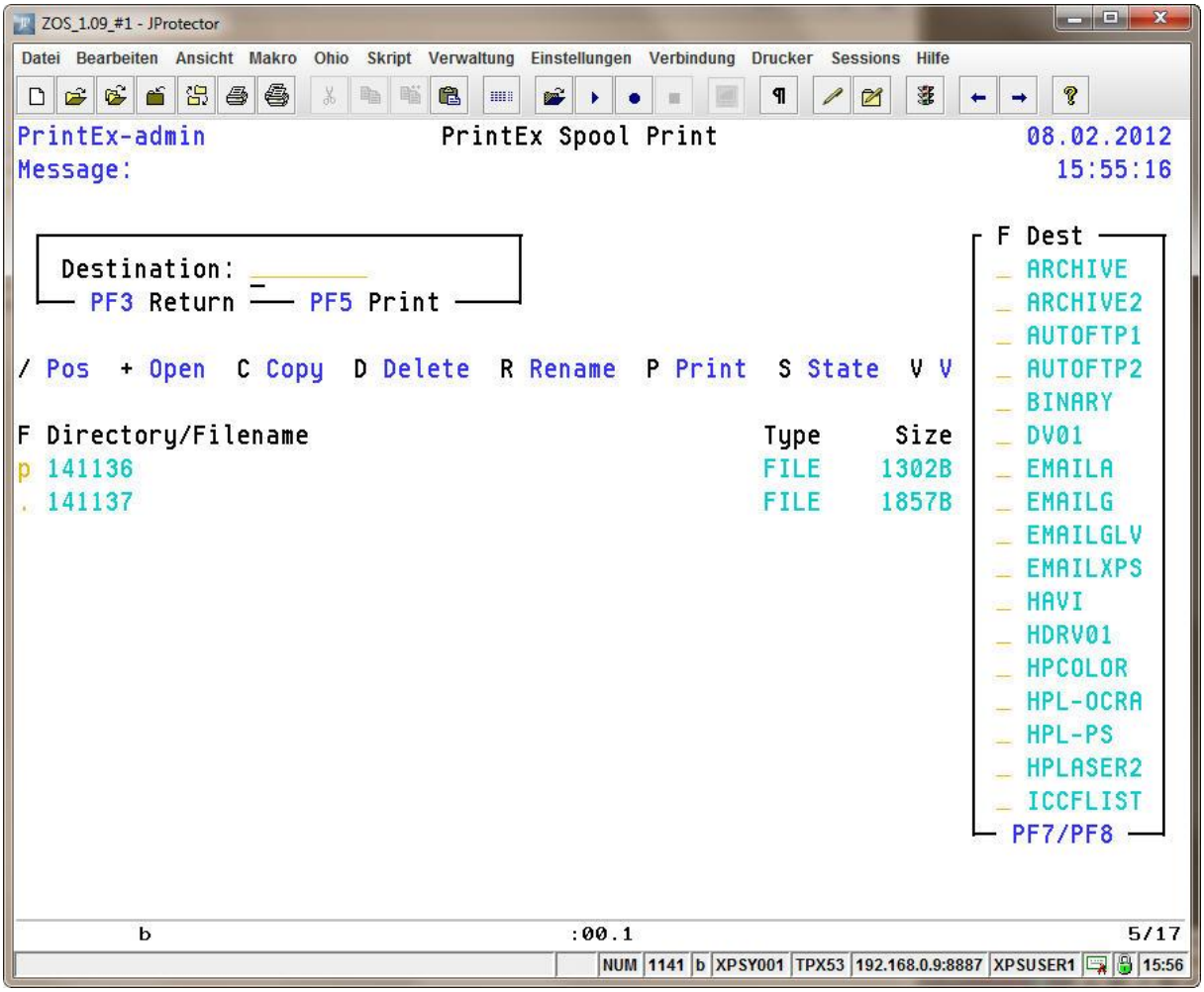


Fig. 48: PrintEx Spool Print

Function key assignments

PF3 Return to the spool maintenance.

PF5 After the desired destination has been chosen with 'X' the selected entry will be printed.

Description of the fields

Dest

This is the print destination. In order to be selected the destination must be defined in the index of the PrintEx destinations (see also chapter 'Destinations' on page 36). All available destinations are listed in the right part of the screen mask. The list can be scrolled with the PF7 and PF8 keys. The destination to be used can be selected entering 'X' in the function field of the destination and then pressing the Enter key.

Function selection

S	State

This function can be used to display the state of a file or a directory. The state display includes information about the entry's creation date and time, the file size and the compressed size (0 for directories), the entry's expiration date and time and the content of some XPS internal flags that might be useful in the context of problem analysis.

V	View

This function can be used to display the content of the selected file. The file content will displayed in the screen mask shown below:

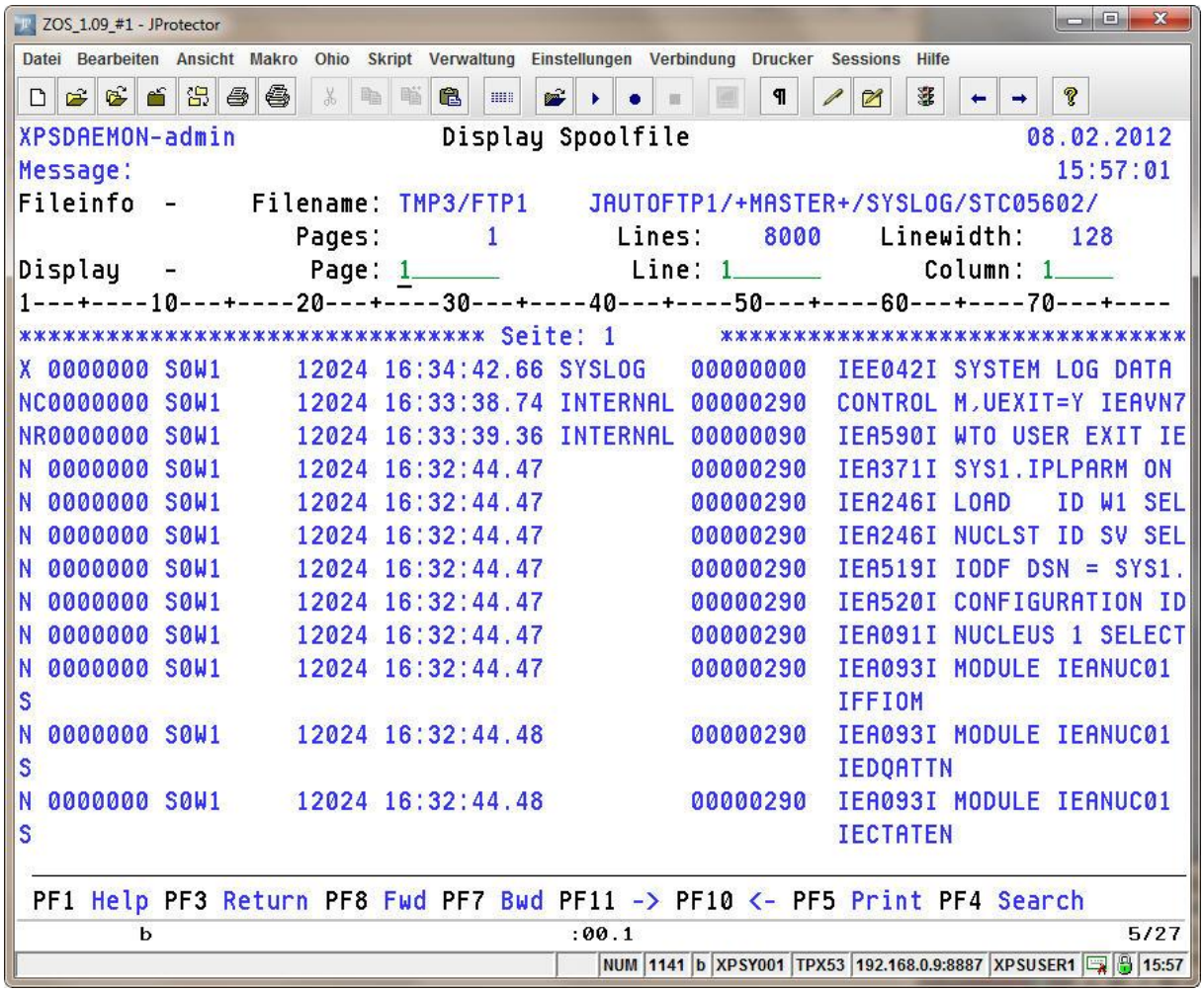


Fig. 49: Display Spoolfile

Function key assignments

PF1 Display the online help.

PF3 Return to spool maintenance.

PF7 Scroll one page backward in the file display. The display will remain unchanged if the beginning of the file is reached.

PF8 Scroll one page forward in the file display. The display will remain unchanged if the end of the file is reached.

PF10 Shift display left.

PF11 Shift display right.

PF5 Print the list (completely or in part) to an arbitrary destination.

PF4 Search the list for a specific character string.

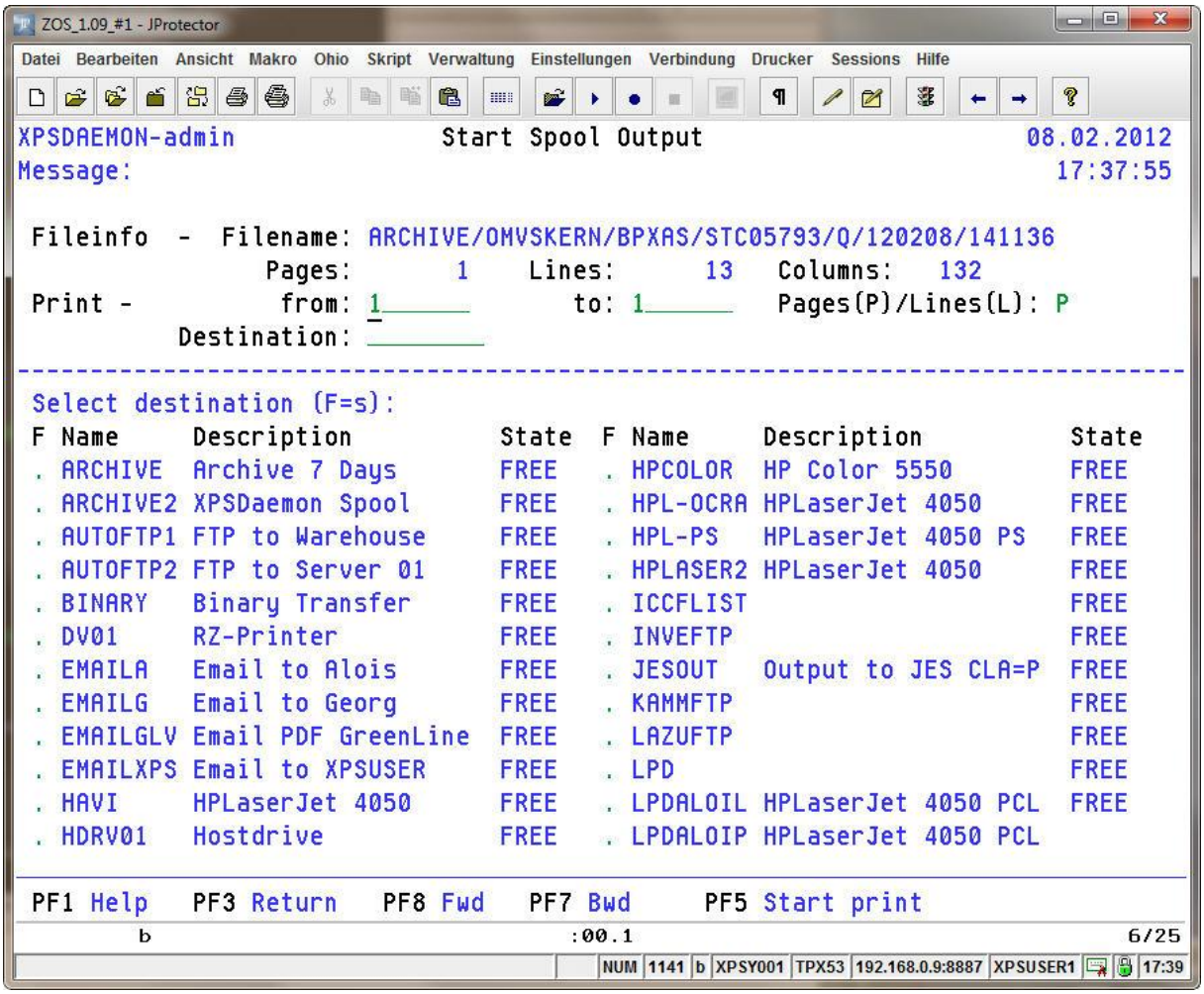


Fig. 50: Start Spool Output

Function key assignments

PF1 Display the online help.

PF3 Return to the display of the spool file.

PF7 Scroll one page backward in the printer index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the printer index. The display will remain unchanged if the end of the index is reached.

PF5 Start printing.

Description of the fields

Pages/Lines from If only part of the list is to be printed, this field can be used to specify for printing the first page or line.

Pages/Lines to If only part of the list is to be printed, this field can be used to specify for printing the last page or line.

Pages(P)/Lines(L) If only part of the list is to be printed, this field must be used to specify if the preceding information relates to pages (P) or lines (L).

Destination This is the print destination. In order to be selected the destination must be defined in the index of the PrintEx destinations (see also chapter 'Destinations' on page 36). All available destinations are listed in the lower part of the screen mask. The list can be scrolled with the PF7 and PF8 keys. The destination to be used can be selected entering 'X' in the function field of the destination and then pressing the Enter key.

Display Print Queue

The 'Display Print Queue' menu option can be used to observe and process print output routed to the XPS spool.

All users who have not been granted PrintEx administrator rights will only be able to use this menu option.

Choosing the menu option 'E Display Print Queue' will lead to the screen mask shown below.

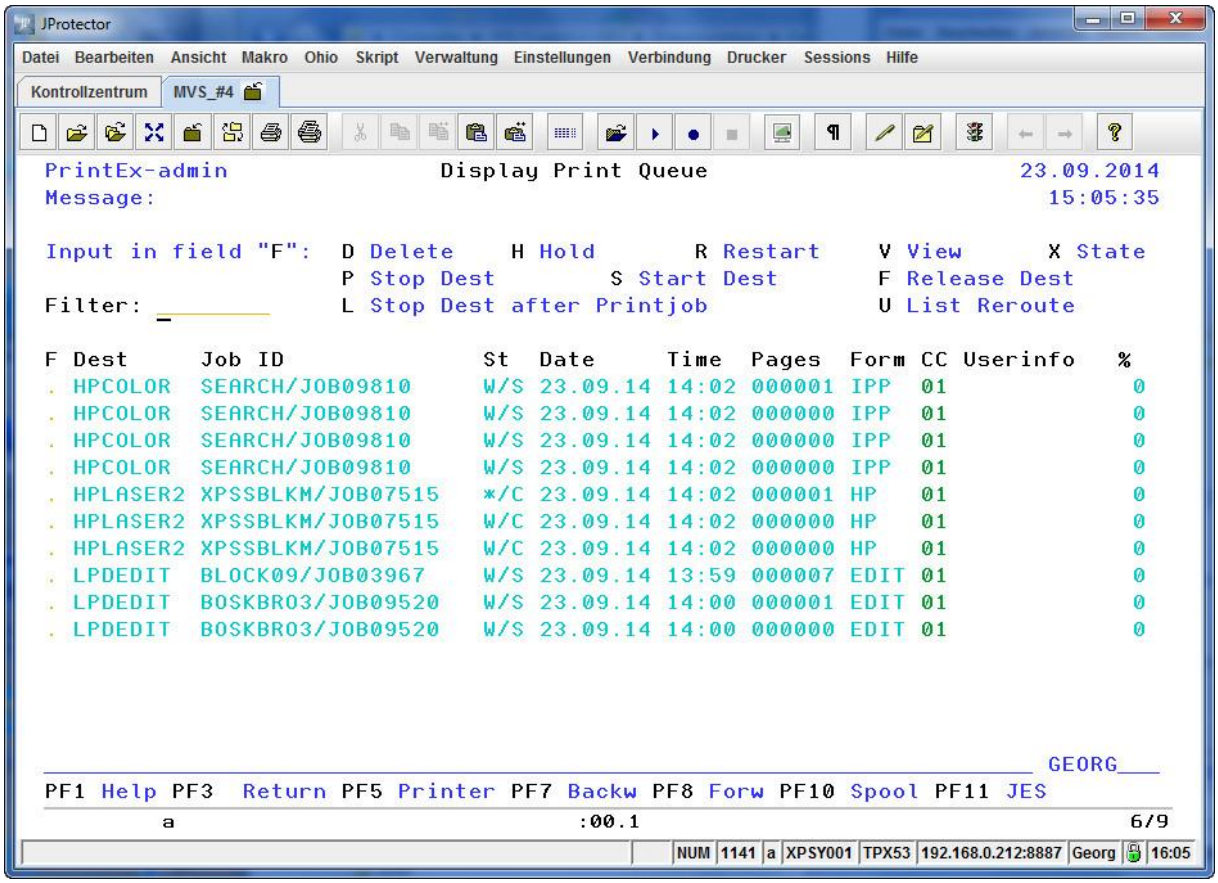


Fig. 51: Display Print Queue

Function key assignments

PF1 Display the online help.

PF3 Return to the PrintEx menu.

PF5 Display the printer index.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

PF10 Display the PrintEx spool maintenance.

PF11 Display the PrintEx JES maintenance.

Description of the fields

Filter This field can be used to define a filter for the display.

If, for example, the filter 'HPLASER' is chosen, only those listings will be listed in the display whose destination is 'HPLASER'.

F Choice box for one of the functions listed in the screen mask header.

Dest The name of the destination.

Job ID The short name of the print file. For JES spool files the Jobname/Jobid combination will be displayed. For VTAM spool files the combination of the VTAM ACB-name and the VTAM printer name will be displayed.

St This field shows the current state of the listing (first value) and of the destination (second value). The following values are possible:

Listing	Meaning
W	Listing is free (write).
H	Listing is locked (hold).
*	Listing is in work (working).
P	Listing has been printed (printed).

Destination	Meaning
R	Printer is free (ready).
E	Printer is in error (error).
B	Printer is in use (busy).
C	Printer is connected (connected).
S	Printer is stopped (stopped).

Date Creation date.

Time Creation time.

Pages Number of pages.

Form Value of the JES 'FORMS=' option.

CC Value of the JES 'COPIES=' option.

Userinfo Value of the JES 'USERDATA=' option.

% Percent of list data already printed.

Function selection

Field 'F' can be used to choose one of the functions listed in the screen mask header.

D	**Delete**

The selected entry can be deleted using function 'D'.

H	**Hold**

The selected listing can be stopped using function 'H'. A stopped listing will not be printed until this is manually requested selecting function 'R' or until the listing is deleted.

R Restar

Using function 'R', a previously stopped listing can be restarted, which means being printed.

V View

The selected listing will be displayed. Displaying a listing makes additional functions available, such as partial printing, as described in chapter 'Spool Maintenance' on page 121.

P Stop Dest

The selected destination will be stopped. Printjobs currently active for this printer will be stopped. Furthermore all listings scheduled for printing on this printer will be stopped as well.

S Start Dest

The selected destination will be restarted. All previously stopped listings scheduled for printing on this printer will be printed.

F Release Dest

If PrintEx is unable to release a destination because of an error - destination state 'E' or 'B' – the destination can be released manually using function 'F'.

L Stop Dest after Printjob

The seleted destination will be stopped after the currently active print job has been completely processed. All listings scheduled for printing on this printer will be stopped.

U List Reroute

Choosing function 'U List Reroute' for a listing will lead to the screen mask shown below which can be used to reroute the listing to another destination.

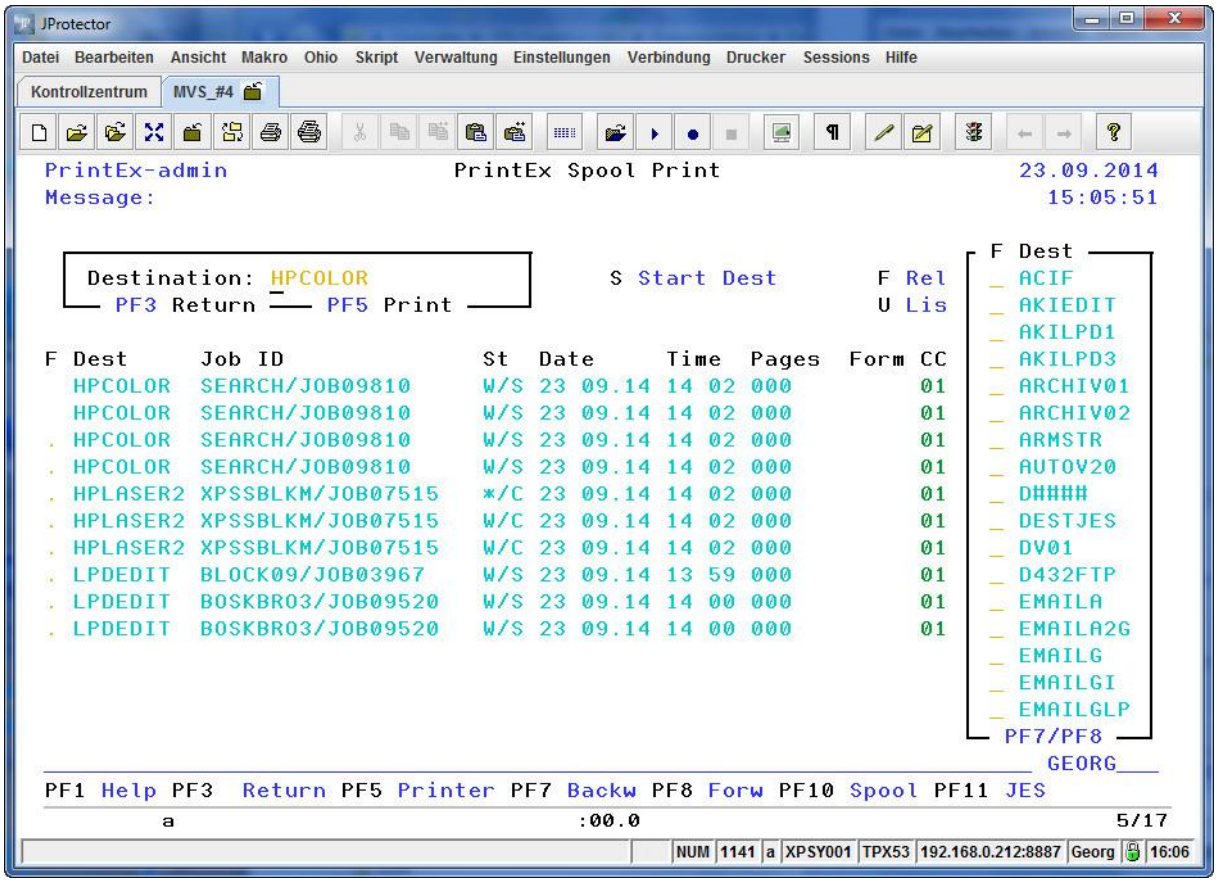


Fig. 52: Display Print Queue – rerouting a list

Function key assignments

PF3 Return to the print queue display.

PF5 Reroute the listing to the chosen destination without rerouting.

PF7 Scroll one page backward in the destinations index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the destinations index. The display will remain unchanged if the end of the index is reached.

Description of the fields

Destination This field is used to specify the new destination for the list. The destination can either be typed in or be chosen from the destinations index displayed in the right area of the screen mask.

After a list has been rerouted it will be removed from the previously associated destination.

Display JES-Output Queue

After pressing the PF11 key from the print queue display the contents of the JES-Output Queue can be listed using the following screen mask:

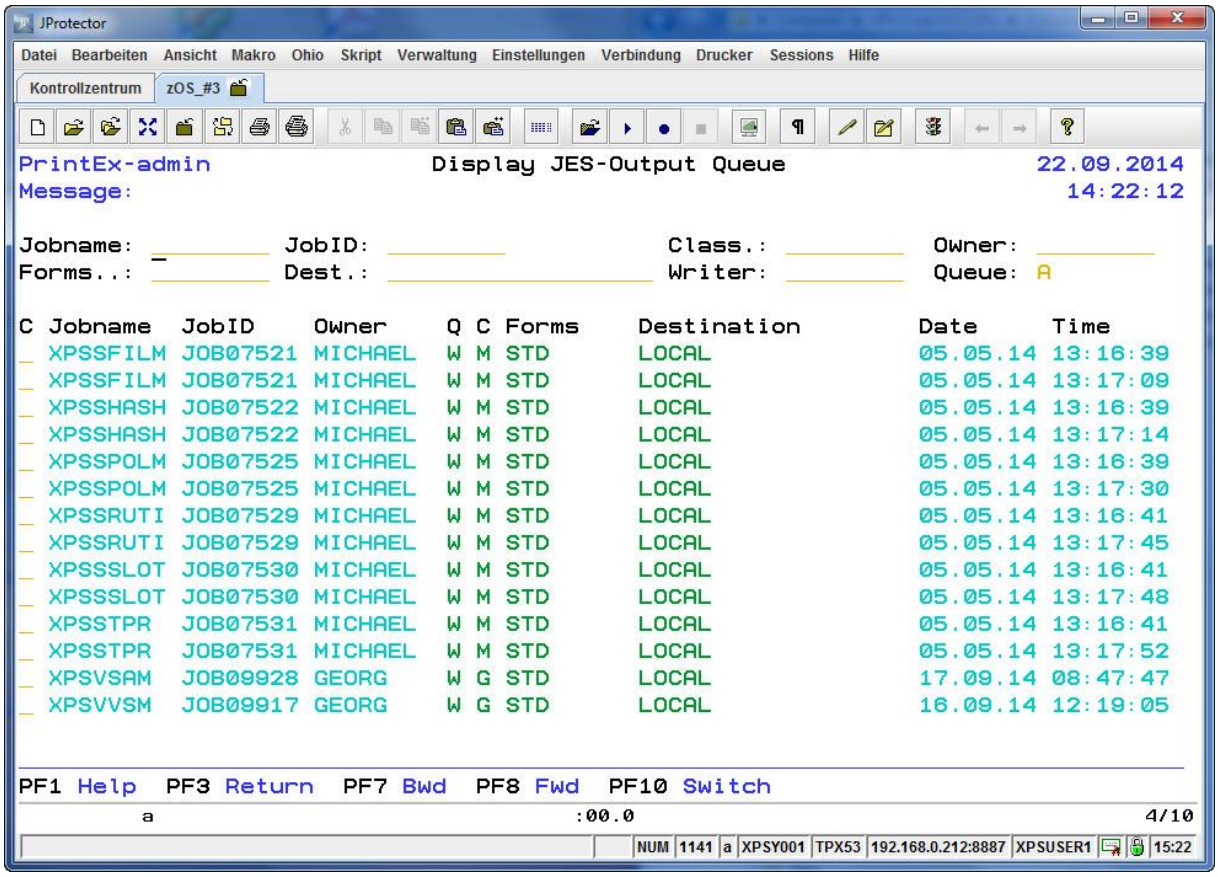


Fig. 53: Display JES-Output Queue

Function key assignments

PF1 Display the online help.

PF3 Return to the display of the print queue.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

PF10 Display additional information.

Description of the fields

Jobname This field can be used as input for a filter based on an element's job name. After pressing the Enter-key the display will be recreated respecting the chosen filter. The input may contain a wild card such as 'JOB12*'.

JobID This field can be used as input for a filter based on an element's job id. After pressing the Enter-key the display will be recreated respecting the chosen filter. The input may contain a wild card such as 'STC*'.

Class This field can be used as input for a filter based on an element's class. After pressing the Enter-key the display will be recreated respecting the chosen filter. The input may contain of a maximum of 8 job classes such as 'ABC'.

Owner This field can be used as input for a filter based on an element's owner. After pressing the Enter-key the display will be recreated respecting the chosen filter. The input may contain a wild card such as 'USER1*'.

Forms This field can be used as input for a filter based on an element's forms. After pressing the Enter-key the display will be recreated respecting the chosen filter. The input may contain a wild card such as 'STD*'.

Dest. This field can be used as input for a filter based on an element's destination. After pressing the Enter-key the display will be recreated respecting the chosen filter. The input may contain a wild card such as 'LOC*'.

Writer This field can be used as input for a filter based on an element's writer. After pressing the Enter-key the display will be recreated respecting the chosen filter. The input may contain a wild card such as 'PRG*'.

Queue This field can be used as input for a filter based on the queue containing the element. After pressing the Enter-key the display will be recreated respecting the chosen filter. Valid inputs for queue filtering are

'W' Display the JES write queue

'H' Display the JES hold queue

'A' Display the JES write and hold queues

Function selection

Field 'C' can be used to choose one of the following functions.

S	**Display selected JES spool element**

Using this function the selected JES element can be displayed. The display offers a comfortable search function as well as the possibility to print out the document on any of the defined PrintEx printers.

P	**Delete selected JES spool element**

This function can be used to delete the selected JES element.

?	**Display details for the selected JES spool element**

This function can be used to switch to the details display for the selected JES element which is carried out using the following screen mask:

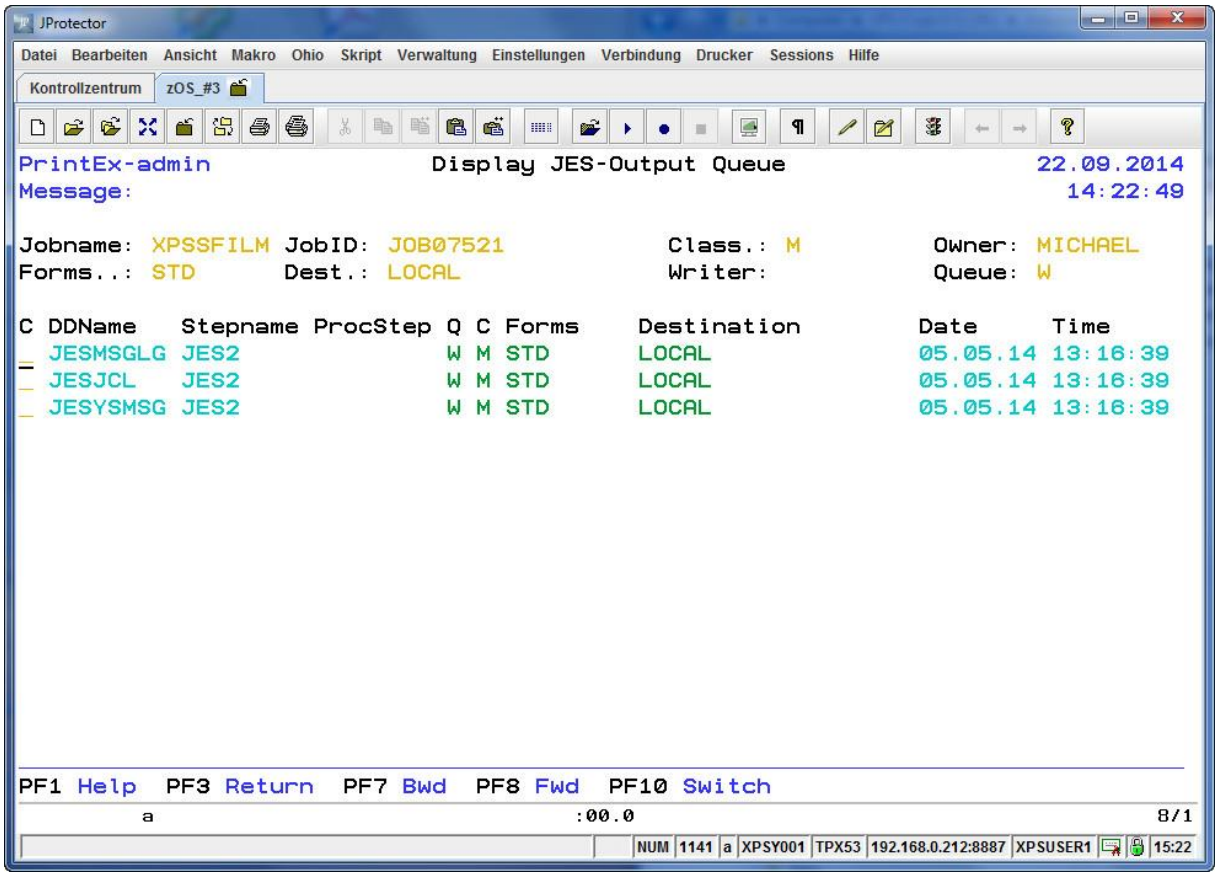


Fig. 54: Detail display JES-Output Queue

Function key assignments

PF1 Display the online help.

PF3 Return to the display of the JES-output queue.

PF7 Scroll one page backward in the index. The display will remain unchanged if the beginning of the index is reached.

PF8 Scroll one page forward in the index. The display will remain unchanged if the end of the index is reached.

PF10 Display additional information.

Function selection

Field 'C' can be used to choose one of the following functions.

S	**Display selected JES spool element**

Using this function the selected JES element can be displayed. The display offers a comfortable search function as well as the possibility to print out the document on any of the defined PrintEx printers.

P	**Delete selected JES spool element**

This function can be used to delete the selected JES element.

Shutdown XPSDaemon

A controlled shutdown of XPSDaemon can be carried out choosing the menu option 'F Shutdown XPSDaemon' which will lead to the screen mask shown below.

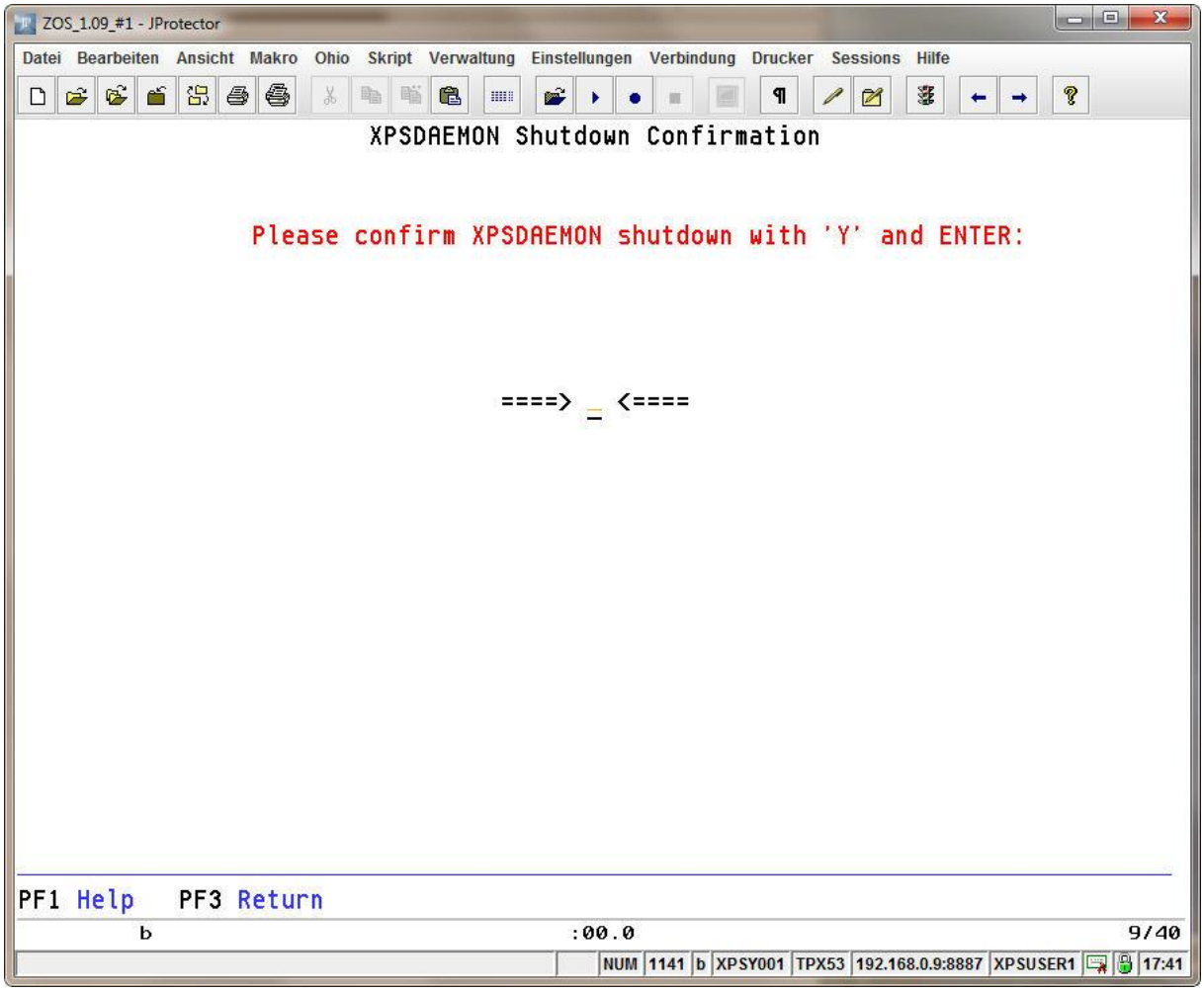


Fig. 55: Shutdown XPSDaemon

XPSDaemon will only be shut down if the character 'Y' is entered into the screen masks input field and if the Enter key is pressed.

After the XPSDaemon server has been shut down, the PrintEx functionality is no longer available.

The terminal name as well as the name of the user causing the shutdown will be logged to the system console.

Chapter

5

Batch Maintenance

The batch processor

The PrintEx online maintenance functions are complemented by numerous functions of the PrintEx batch processor. The batch processor can be used to create and administer all definitions needed to control the PrintEx workflow. Some administration functions are exclusively provided through the batch processor while others can be used in online mode as well as in batch mode.

One must consider that batch processor functions that make changes to the PrintEx system file require the PrintEx system file to be opened in write mode. This makes it necessary to close the PrintEx system file in any online region where it is opened in write mode while a modifying batch processor job is executed.

The various batch functions are selected through the provision of parameter cards to the PrintEx batch processor program 'XPSVTMNT'. Each batch function is linked to a unique 4-byte operation code followed by a list of function specific parameters.

The operation code and the parameters must be coded between columns 1 and 72. Parameters can be separated with commas or blanks while the operation code must be followed by a blank.

Sometimes one card will not be enough to specify all needed parameters. In these cases the availability of continuation cards must be indicated. To do so, the last parameter in a card must be suffixed with a comma. Continuation cards are constructed like the first card however without the operations code. If a parameter option will contain one or more blanks or if more than one option will be specified for a single parameter, the option(s) must be enclosed in double quotes.

Each parameter card must not contain more than one operations code.

Examples

LANG E

This card is used to specify the language to be used for messages issued by the batch processor.

DUMP

This card consisting of an operation code only can be used to create a formatted print out of the content of the PrintEx dump file.

```
//XPSVMNT  JOB ,'PRINTEX MAINT',CLASS=A,MSGCLASS=I
 //MNT      EXEC PGM=XPSVTMNT
 //STEPLIB  DD DSN=XPSDAEM.V600.LOADLIB,DISP=SHR
 //XPSVFIL  DD DSN=XPSDAEM.V600.vfil,DISP=SHR
 //XPSVTRA  DD DSN=XPSDAEM.V600.trace,DISP=SHR
 //XPSVDMP  DD DSN=XPSDAEM.V600.dump,DISP=SHR
 //TAP      DD DISP=SHR,UNIT=TAPE,VOL=SER=XPSDAE
 //         LABEL=(1,SL,EXPDT=98000),DSN=XPSDAEM
 //SYSPRINT DD SYSOUT=*
 //SYSIN    DD *
 ... PARAMETER CARDS
```

Fig. 56: Sample job for the batch processor

ADDU – Create a user entry

The 'ADDU' function can be used to add new PrintEx user entries.

The parameter card has the following format:

```
ADDU NAME=name,PSWD=password,PROF=ADMIN,MODE=USER
```

'name' This is the key for the new user definition. The key has to be unique, must not exceed a length of 20 characters, may contain only alphanumeric characters and can be generically shortened using the '*' character.

The user will be required to enter the user name in order to be identified when signing on to PrintEx.

Input for the user name is required.

'password' This is the user's password which must not exceed a length of 8 characters.

'ADMIN' This is the name of the internal PrintEx user profile to be linked with the user entry. This required option must be 'ADMIN' in all cases.

'USER' If a user shall not have administrator rights and shall not be able to delete entries from the PrintEx spool file, 'MODE=USER' must be specified.

ADST – Create a destination

The 'ADST" function can be used to add new PrintEx destinations. PrintEx currently supports the following different types of destination: TCP/IP, JES, SNA, e-mail and file.

TCP/IP

The parameter card to create a TCP/IP destination has the following format:

```
ADST NAME=name,DESC='desc',TYPE=IP,IPADD=ipaddr,
 PORT=port,RESTRT=restrt,
 MODEL='(080,PCLP080),(100,PCLP100),(120,PCLP120),(132,PCLP132)'
```

'name' This required option is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

'TYPE=IP' This required parameter is used to specify the type of the destination. For a TCP/IP destination the input must be 'IP'.

'desc' This field can be used for an optional description of the destination with up to 20 characters.

'ipaddr' The TCP/IP address of the network printer or its DNS name.

'port' The TCP/IP port of the network printer. If the 'direct socket' protocol is to be selected, port 9100 must be specified. If the LPR/LPD protocol is to be selected, port 515 must be specified.

'restrt' This parameter can be used to specify a time interval in seconds that PrintEx shall wait until the next attempt if the establishment of the connection with the TCP/IP address has failed.

If the next attempt to establish a connection with the TCP/IP target also fails, PrintEx uses the value of the system parameter 'Print Restart Interval' for subsequent attempts to establish a connection.

'model' PrintEx uses 'models' for the conversion of print data. Every destination must be connected with at least one model.

Models are used to define a number of options, e. g., the code page to be used for EBCDIC to ASCII translation, prefix data and suffix data to be inserted into the print data stream and transformation rules for control characters such as page feed, line feed, carriage return, back space and channel selection.

PrintEx comes with a number of predefined models for standard conversions like conversion of the print output to the PCL printer language, to PostScript and to Adobe PDF.

For each model the maximum width and the name of the model must be specified.

It is possible to assign as many as six models to a single destination. This makes it easier to use different models for output that varies only in the number of characters per line by specifying models that vary only in the used font size.

The complete option expression must be put in single quotes. Each model definition must be put in parentheses. The first value of a model definition will be interpreted as the maximum width and the second value as the model name.

JES

The parameter card to create a JES destination has the following format:

```
ADST NAME=name,DESC='desc',TYPE=JES,DEST=dest,
 WRIT=writer,CLASS=class,FORM=form,FCB=fcb,DISP=disp,
 MODEL='(080,PCLP080),(100,PCLP100),(120,PCLP120),(132,PCLP132)'
```

'name' This required option is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

'TYPE=JES' This required parameter is used to specify the type of the destination. For a JES destination the input must be 'JES'.

'desc' This field can be used for an optional description of the destination with up to 20 characters.

'dest' Using this option the destination ('DEST=') for the created SYSOUT list can be specified.

'writer' Using this option the external writer ('WRITER=') for the created SYSOUT list can be specified.

'class' Using this option the output class ('CLASS=') for the created SYSOUT list can be specified.

'form' Using this option the form name ('FORMS=') for the created SYSOUT list can be specified.

'fcb' Using this option the forms control buffer ('FCB=') for the created SYSOUT list can be specified.

'disp' Using this option the disposition ('DISP=') for the created SYSOUT list can be specified.

'model' This option is used to define the models available for the destination. A description is given on page 137.

SNA

The parameter card to create a SNA destination has the following format:

```
ADST NAME=name,DESC='desc',TYPE=SNA,VAPPL=vappl,
 MODEL='(080,PCLP080),(100,PCLP100),(120,PCLP120),(132,PCLP132)'
```

'name' This required option is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

'TYPE=SNA' This required parameter is used to specify the type of the destination. For a SNA destination the input must be 'SNA'.

'desc' This field can be used for an optional description of the destination with up to 20 characters.

'vappl' The VTAM APPL name of the SCS printer is defined with this option. If data is available for this destination, the data will be converted into a SCS datastream (LUType 1) and will be transmitted to the specified VTAM APPL. If the printer is currently bound to another application (e. g. CICS), PrintEx tries to automatically acquire the printer. The printer will be available for other applications as soon as the PrintEx print job has ended.

'model' This option is used to define the models available for the destination. A description is given on page 137.

E-Mail

The parameter card to create an e-mail destination has the following format:

```
ADST NAME=name,DESC='desc',TYPE=EMAIL,
 SERVER=server,ACNT=acnt,PASSW=passw,FROM=from,TO=to,CC=cc,
 SUBJ='subj',BODY='body',
 MODEL='(080,PCLP080),(100,PCLP100),(120,PCLP120),(132,PCLP132)'
```

'name' This required option is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

'TYPE=EMAIL' This required parameter is used to specify the type of the destination. For an e-mail destination the input must be 'EMAIL'.

'desc' This field can be used for an optional description of the destination with up to 20 characters.

'server' This is the TCP/IP address or the DNS name of the e-mail server to which the output data is to be sent using the SMTP protocol.

'acnt' If the SMTP server requires authentication, the user name to be used for the logon must be specified with this option.

'passw' If the SMTP server requires authentication, the password to be used for the logon must be specified with this option.

'from' This option is used to specify the e-mail address of the sender of the e-mail.

To enable the specification of the sender address using job control, the placeholder '&EMLFR' can be used for this option. In this case PrintEx will use the 'MAILFROM' parameter from the OUTPUT JCL statement to fill in the sender address at runtime.

'to' This option is used to specify the e-mail address of the receiver of the e-mail.

To enable the specification of the receiver address using job control, the placeholder '&EMLTO' can be used for this option. In this case PrintEx will use the 'MAILTO' parameter from the OUTPUT JCL statement to fill in the receiver address at runtime.

'cc' If the e-mail is to be sent to more than one receiver, the e-mail addresses of all receivers can be specified with this option (cc = carbon copy). Individual e-mail addresses are to be separated with semicolons.

To enable the specification of additional receiver addresses using job control, the placeholder '&EMLCC' can be used for this option. In this case PrintEx will use the 'MAILCC' parameter from the OUTPUT JCL statement to set the additional receiver addresses at runtime.

'subj' This option is used to specify the subject of the e-mail.

To enable the specification of the e-mail's subject using job control, the placeholder '&TITLE' can be used for this option. In this case PrintEx will use the 'TITLE' parameter from the OUTPUT JCL statement to set the e-mail's subject at runtime.

'body' This option is used to specify the body text of the e-mail. The original data will be sent as a PDF attachment with the e-mail.

To enable the specification of the body text using job control, the placeholder '&UDATA' can be used for this option. In this case PrintEx will use the 'USERDATA' parameter from the OUTPUT JCL statement to include up to 60 characters as message body at runtime.

'model' This option is used to define the models available for the destination. A description is given on page 137.

File

The parameter card to create a file destination has the following format:

```
ADST NAME=name,DESC='desc',TYPE=FILE, FILENM='filenm',
 MODEL='(080,PCLP080),(100,PCLP100),(120,PCLP120),(132,PCLP132)'
```

'name' This required option is the key for the new destination definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

'TYPE=FILE' This required parameter is used to specify the type of the destination. For a file destination the input must be 'FILE'.

'desc' This field can be used for an optional description of the destination with up to 20 characters.

'filenm' This option is used to specify the target file name on the hierarchical file system. The file name can be up to 128 characters long.

Subdirectories can be created by inserting the slash character ('/').

In order to generate variable file names, the following placeholders can be used:

&USERID	User name from JES spool file.
&JOBNAME	SYSOUT jobname from JES spool file.
&JOBID	SYSOUT job id from JES spool file.
&CLASS	SYSOUT class from JES spool file.
&FILE	Name from JES spool file.
&DEST	SYSOUT destination from JES spool file.
&WRITER	External writer name from JES spool file.
&FORM	Forms name from JES spool file.
&FCB	FCB name from JES spool file.
&DATE	Date of file generation (JES/VTAM).
&TIME	Time of file generation (JES/VTAM).
&VAPPL	Name of the originating VTAM application.
&ADDR#1	First field of the OUTPUT command 'ADDRESS'.
&ADDR#2	Second field of the OUTPUT command 'ADDRESS'.
&ADDR#3	Third field of the OUTPUT command 'ADDRESS'.
&ADDR#4	Fourth field of the OUTPUT command 'ADDRESS'.
&TITLE	Value of the OUTPUT statement 'TITLE'.
&UDATA	Value of the OUTPUT statement 'USERDATA'.

The following example shows how PrintEx generates a file name:

Specified file name:

&USERID/&CLASS/&JOBNAME/&JOBID/&DATE/&FILE

Resulting file name:

XPSSYST/A/JOB0010/STC05998/040901/D0000101.SYSPRINT

If this option is not specified, PrintEx will generate the default file names '&FILE.pdf' for PDF files and '&FILE.txt' for text files respectively.

'model' This option is used to define the models available for the destination. A description is given on page 137.

AJPR – Create a JES printer

The 'AJPR' function can be used to create a JES printer.

The parameter card has the following format:

```
AJPR NAME=name,DESC='desc',STATE=state,SDEST=sdest,SWRIT=swriter,
 SFORM=sform,SCLASS=sclass,DISP=disp,SEPS=seps,SEPE=sepe,DEST='dest'
```

'name' This is the key for the new printer definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

Input for the name is required.

'desc' This field can be used for an optional printer description with up to 20 characters.

'state' This field can be used to specify the desired initial printer state.

If the default value 'A' is specified, the criteria to select output from JES for the printer will be activated during a new PrintEx startup.

If 'D' is specified the printer state will be drained and the specified selection criteria will not be considered.

If 'H' is specified the printer state will be hold. This means that the criteria to select output from JES will be activated immediately. However, incoming print data will be stored by PrintEx but will not be sent to the associated destination.

JES selection criteria JES printers will be created based on the selection criteria 'Destination', 'Class', 'Writer' and 'Form'.

As soon as the JES2/JES3 spool reports to PrintEx the prescence of output data, PrintEx compares the selection criteria of the output data with the defined JES printers.

PrintEx will select for output the JES definition having the largest number of matching output data characteristics compared with the selection criteria. After a JES printer has been selected, the output data will be sent to all defined destinations.

Any combination of the various selection criteria can only defined once.

'sdest' The designated SYSOUT destination for the printer.

'sclass' The designated SYSOUT class for the printer. Up to 8 classes can be defined for a JES printer.

'swriter' The designated SYSOUT external writer for the printer.

'sform' The designated SYSOUT form for the printer.

'disp' The designated disposition of the JES spool file after printing. Possible values are 'DELETE', 'HOLD' and 'KEEP'.

'seps' The designated separator start pages for the spool file. Standard separator start pages named 'SEP#S01' through 'SEP#S05' are available. Furthermore it is possible to define installation specific separator pages. How to do this is explained in the chapter 'Separator Pages' on page 152.

'sepe' The designated separator end pages for the spool file. Standard separator end pages named 'SEP#E01' through 'SEP#E05' are available. Furthermore it is possible to define installation specific separator pages. How to do this is explained in the chapter 'Separator Pages' on page 152.

'dest' This option can be used to define up to 10 destinations or pool names be defined for this printer.

Destinations can be defined using menu selection '3 Destinations' and pool names can be defined using menu selection '4 Pool Definitions'.

As soon as print data arrives for the printer, PrintEx will send the print data to each destination and/or to the first reachable destination from the pool.

If '&DEST' is defined PrintEx will use the JES destination (DEST) as PrintEx destination.

If '&WRITER' is defined PrintEx will use the JES external writer destination (WTR) as PrintEx destination.

ATXT – Import a text

PrintEx allows the use of prefix and suffix texts in the context of the definition of models. The 'ATXT' function can be used to transfer texts stored in the XPSDAEAM.V600.MACLIB into the PrintEx system file XPSVFIL.

The record length of the texts stored in the maclib must be 80.

The parameter card has the following format:

```
ATXT MEMBER=member,DESC='desc'
```

'member' This is the name of the text. The name has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

The XPSDAEM.V600.MACLIB must contain a member with the name specified as key.

Input for the name is required.

'desc' This field can be used for an optional description of the text with up to 20 characters.

AVPR – Create a VTAM printer

The 'AVPR' function can be used to create a VTAM printer.

The parameter card has the following format:

```
AVPR NAME=name,DESC='desc',STATE=state,DEST='dest'
```

'name' This is the key for the new printer definition. The key has to be unique, must not exceed a length of 8 characters and may contain only alphanumeric characters.

The printer name must be defined as an APPL-statement in the ACF/VTAM network.

Input for the VTAM-APPL name is required.

'desc' This option can be used for an optional printer description with up to 20 characters.

'state' This option can be used to specify the desired initial printer state.

If the default value 'A' is specified, the printer will be opened during each PrintEx startup. Afterwards the printer is ready to be acquired by sub-systems such as CICS or IMS.

If 'D' is specified the printer state will be drained. If the printer is currently open it will be closed. During a PrintEx startup no action will be undertaken for the printer.

If 'H' is specified the printer state will be hold. This means that the printer will be opened and will be ready for acquisition. However, incoming print data will be stored by PrintEx but will not be sent to the associated destination.

'dest' This option can be used to define up to 10 destinations or pool names for this printer.

Destinations can be defined using menu selection '3 Destinations' and pool names can be defined using menu selection '4 Pool Definitions'.

As soon as print data arrives for the printer, PrintEx will send the print data to each destination and/or to the first reachable destination from the pool.

BACK – Create a backup of XPSVFIL

It is suggested to regularly backup the PrintEx system file 'XPSVFIL'. Backups of 'XPSVFIL' on (virtual) tapes or cassettes can be created using the batch processor's operation code 'BACK'.

The parameter card has the following format:

```
BACK
```

CPAG – Load standard code pages

In the context of the processing of print data PrintEx needs to translate output data from the mainframe representation in EBCDIC to the network representation in ASCII. In order to do so, country specific code pages need to be available. Along with PrintEx come various standard code pages for the western countries. The PrintEx standard code pages can be reloaded if necessary using the operation code 'CPAG'.

The PrintEx standard code pages are by default stored in the maclib member 'CODEPAGE' in the PrintEx macro library XPSDAEM.V600.MACLIB.

The parameter card has the following format:

```
CPAG MEMBER=member
```

'member' This is the name of the member containing the standard code pages. The name must not exceed a length of 8 characters and may contain only alphanumeric characters.

The XPSDAEM.V600.MACLIB must contain a member with the name specified as key.

Input for the name is required.

DELU – Delete a user entry

The operation code 'DELU' can be used to delete a user entry from the PrintEx system file.

The parameter card has the following format:

```
DELU NAME=name
```

'name' The key of the user definition to delete (max. 20 characters long).

DDST – Delete a destination

The operation code 'DDST' can be used to delete a destination from the PrintEx system file.

The parameter card has the following format:

```
DDST NAME=name
```

'name' The key of the destination to delete (max. 8 characters long).

DJPR – Delete a JES printer

The operation code 'DJPR' can be used to delete a JES printer from the PrintEx system file.

The parameter card has the following format:

```
DJPR NAME=name
```

'name' The key of the JES printer to delete (max. 8 characters long).

DUMP – Print a formatted PrintEx dump

If PrintEx detects a program check or a program loop a storage dump will be written to the PrintEx dump file 'XPSVDMP'. In order to minimize the use of online resources the dump will be written unformatted to the PrintEx dump file. Later on, when the dump is printed using the batch processor operation code 'DUMP', the dump will be formatted.

Formatted PrintEx dumps can be created using the following parameter card:

```
DUMP
```

In order to print the formatted dumps, the PrintEx dump file 'XPSVDMP' must not be opened in the PrintEx online region.

DVPR – Delete a VTAM printer

The operation code 'DVPR' can be used to delete a VTAM printer from the PrintEx system file.

The parameter card has the following format:

```
DVPR NAME=name
```

'name' The key of the VTAM printer to delete (max. 8 characters long).

FREC – Determine the number of free blocks on XPSVFIL

The operation code 'FREC' can be used to determine the number of free (unused) blocks in the PrintEx system file 'XPSVFIL'. Every block in the PrintEx system file has a length of 1024 bytes.

The parameter card has the following format:

```
FREC
```

IMOD – Load standard models

PrintEx uses 'models' for the conversion of print data. Every destination must be connected with at least one model.

Models are used to define a number of options, e. g., the code page to be used for EBCDIC to ASCII translation, prefix data and suffix data to be inserted into the print data stream and transformation rules for control characters such as page feed, line feed, carriage return, back space and channel selection.

PrintEx comes with a number of predefined models for standard conversions like conversion of the print output to the PCL printer language, to PostScript and to Adobe PDF.

The standard models are loaded during the PrintEx installation. The operation code 'IMOD' can be used to restore the standard models to the initial state.

The standard models are stored in the PrintEx macro library XPSDAEM.V600.MACLIB.

The parameter card has the following format:

```
IMOD
```

INDU – Print a user index

The operation code 'INDU' can be used to print an index of the user entries defined in the PrintEx system file XPSVFIL. The index will be printed in ascending alphabetical order. Passwords will not be printed.

The parameter card has the following format:

```
INDU
```

INIT – Initialise PrintEx system file XPSVFIL

The operation code 'INIT' can be used to initialise the PrintEx system file XPSVFIL. In order to do so the PrintEx system file must be created using the MVS utility program 'IDCAMS'. All data contained in the current PrintEx system file will get lost during initialization.

The parameter card has the following format:

```
INIT
```

During initialisation all blocks in the PrintEx system will be once written and the administrator block containing the PrintEx system parameters will be newly created.

Special case:

```
INIT SYSTEM
```

If the 'SYSTEM' option is specified only the administrator block will be newly created.

LANG – Choose language for batch messages

The 'LANG' function can be used to choose the language for messages issued by the batch processor. The batch processor will try to load a message module named 'XPSV?HD'. The question mark will be replaced with the language identifier defined with this operation code.

The parameter card has the following format:

```
LANG langident
```

'langident' The language identifier used to complete the name of the module containing the PrintEx batch messages. Possible values are 'D' for German and 'E' for English.

LPAG – Define the number of lines per print page

The 'LPAG' function can be used to define the number of lines per print page printed by the PrintEx batch processor.

The parameter card has the following format:

```
LPAG linenumber
```

'linenumber' This is the designated number of lines per print page. The default value is 66. The maximum value is 99.

REST - Restore a backup of XPSVFIL

The 'REST" function can be used to restore a backup of the PrintEx system file 'XPSVFIL' previously created using the 'BACK' function.

The parameter card has the following format:

```
REST (SL) (REW) (SYSTEM) OPT=option
```

'SYSTEM' If the 'SYSTEM' option and 'OPT=REP' are specified only the PrintEx administrator block containing the PrintEx system parameters will be restored.

'option' This option can be used to decide if existing data is to be replaced (overwritten) during restore ('OPT=REP') or if only such data is to be restored that is not contained in the PrintEx system file 'XPSVFIL' ('OPT=MER' / default) at the time of restore.

SNUP – Open XPSVFIL in read only mode

The 'SNUP' function can be used to open the PrintEx system file in read only mode. This will be the only available open mode if the PrintEx system file is currently open in an online region.

If the PrintEx system file is opened in read only mode only batch processor functions not modifying the file can be executed.

By default, the PrintEx system file will be opened for update.

The parameter card has the following format:

```
SNUP
```

SUPD – Open XPSVFIL in update mode

By default, the batch processor will open the PrintEx system file in update mode. This can also be achieved using the batch processor function 'SUPD'. Specifying the 'SUPD' function will only be necessary if the PrintEx system file has been previously opened in read only mode using the batch processor function 'SNUP'.

The parameter card has the following format:

```
SUPD
```

TRAC – Print a formatted PrintEx trace

The 'TRAC' function can be used to print the contents of the PrintEx trace file 'XPSVTRA'. PrintEx can be termporarily instructed to write trace entries in order to record information about the sequence of processing. It is required to close the trace file in the PrintEx online region before the formatted trace can be printed.

The parameter card has the following format:

```
TRAC
```

TROF – Turn off file trace

The 'TROF' function can be used to turn off the file trace written by the batch processor previously turned on using the 'TRON' function.

The parameter card has the following format:

```
TROF
```

TRON – Turn on file trace

The 'TRON' function can be used to turn on the PrintEx batch processor file trace until this is turned off using the 'TROF' function.

The parameter card has the following format:

```
TRON
```

Chapter

6

Print Exit

Applications

PrintEx makes it possible at various points of execution to influence the processing sequence and to change the print output data. This is carried out using an installation specific print exit program.

Using the exit program print output data can be changed before and after conversion.

If data for a file destination will be processed, the print exit can be used to change the name of the target file about to be created.

Another exit point allows the selected destination to be changed.

During installation the source code of a print exit example program named 'XPSPRTEX' will be copied to the PrintEx maclib.

Exit Definition

If a print exit is to be used the name of the exit program has to be defined using the system parameter 'Print exit' as described on page 107.

Points of execution

The print exit program will receive control at the following points of execution:

'1' after data has been read from the JES spool or from VTAM
'2' before data is converted by PrintEx
'3' after data has been converted by PrintEx
'4' after generation of the file name – called only for file destination
'5' after destination selection

Parameter list

When the print exit program receives control at the defined points of execution, PrintEx will transfer a parameter list to the exit program. The parameter list contains runtime information to be evaluated by the exit program.

Furthermore the parameter list must be used by the exit program to return information to PrintEx.

The following table shows the fixed structure of the parameter list.

Postition	Description
01-01	Point of execution: '1' after data has been read from the JES spool or from VTAM '2' before data will be converted by PrintEx '3' after data has been converted by PrintEx '4' after generation of the file name – called only for file destination '5' after destination selection
02-04	Reserved.
05-12	Printer name.
13-20	VTAM printers: session name (VTAM application). JES printers: internal PrintEx printer name.
21-24 25-28	Points of execution '1' – '3' address of print data. Points of execution '1' – '3' length of print data.
21-24 25-28	Point of execution '4' address of original file name. Point of execution '4' address of new file name.
21-24 25-28	Point of execution '5' address of current destination. Point of execution '5' address of new destination.

Point of execution '1'

After data has been read from the JES spool or from VTAM positions 21-24 of the parameter list are used to transfer the address of the EBCDIC data and positions 25-28 are used to transfer the length of the EBCDIC data to the exit program.

If the transmitted print data is to be changed, the exit program has to allocate a new storage area for the changed data. Positions 21-24 of the parameter list must be used to make known the address of the newly allocated storage and positions 25-28 must be used to return the length of the newly allocated storage to PrintEx. Deallocation of the storage area containing the original print data will be carried out by PrintEx.

Point of execution '2'

If data is to be changed before it is converted by PrintEx, the procedure is the same as described for 'Point of execution '1".

Point of execution '3'

If data is to be changed after it has been converted by PrintEx, the procedure is the same as described for 'Point of execution '1".

One should bear in mind, however, that depending on the destination, the data being provided to the exit program may be encoded in ASCII/OEM/ANSI and no longer in EBCDIC. Additionally the data is already converted to the printer language required by the destination such as PCL, PostScript or PDF respectively.

Point of execution '4'

After the file name has been generated positions 21-24 of the parameter list are used to transfer the address of the file name generated by PrintEx and positions 25-28 are used to transfer the length of the generated file name to the exit program.

The storage area containing the generated file name can be used to return a changed file name to PrintEx.

Point of execution '5'

After the destination has been selected positions 21-24 of the parameter list are used to transfer the address of the selected PrintEx printer instance to the exit program. The structure of the transmitted printer instance data is defined in the member 'VTMPRTQ' in the PrintEx macro library XPSDAEM.V600.MACLIB.

Positions 25-28 contain the address of the selected PrintEx destination. The structure of the transmitted destination instance data is defined in the member 'VTMDST' in the PrintEx macro library XPSDAEM.V600.MACLIB. If the destination is to be changed, the address of the new or changed destination has to be returned to PrintEx at positions 25-28.

Chapter

7

Separator Pages

PrintEx makes it possible to add separator pages before and after printing spool files from JES2/JES3.

During installation five standard start separator pages texts and five standard end separator pages texts are copied to the PrintEx macro library XPSDAEM.V600.DATA.

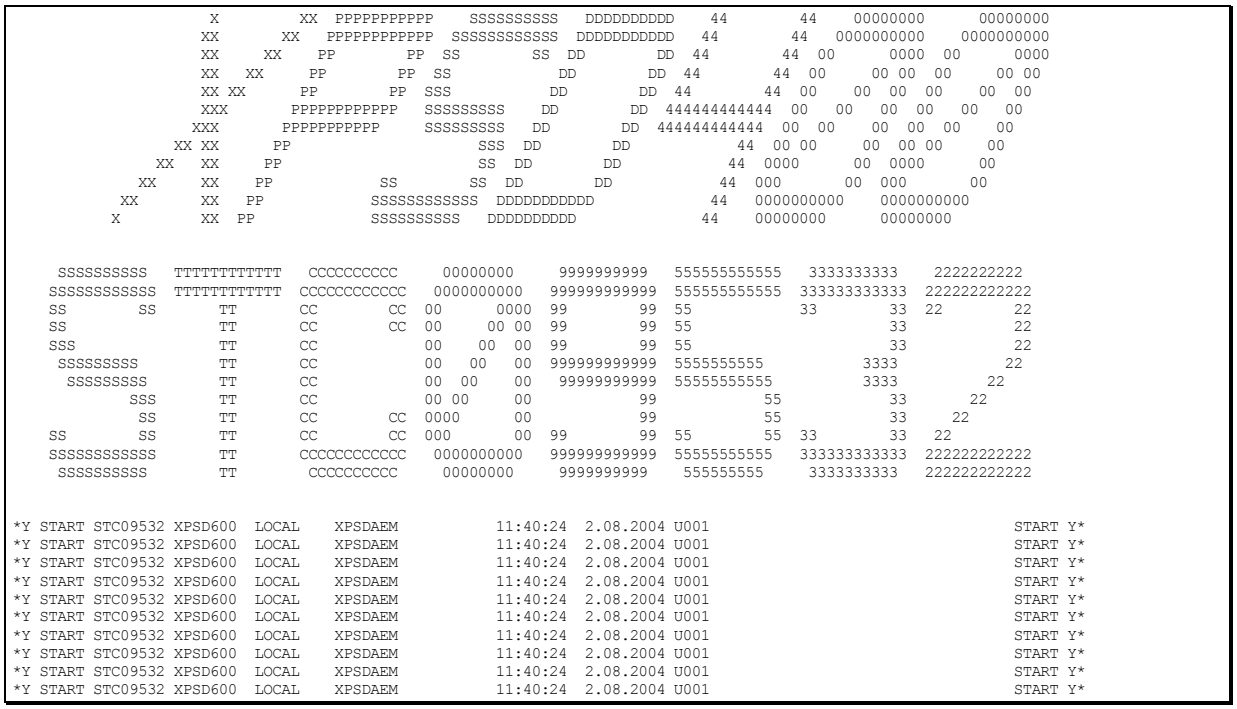
Furthermore it is possible to define individual separator pages using simple commands. Self defined separator pages must also be stored in the PrintEx macro library XPSDAEM.V600.DATA.

The following standard separator pages are available:

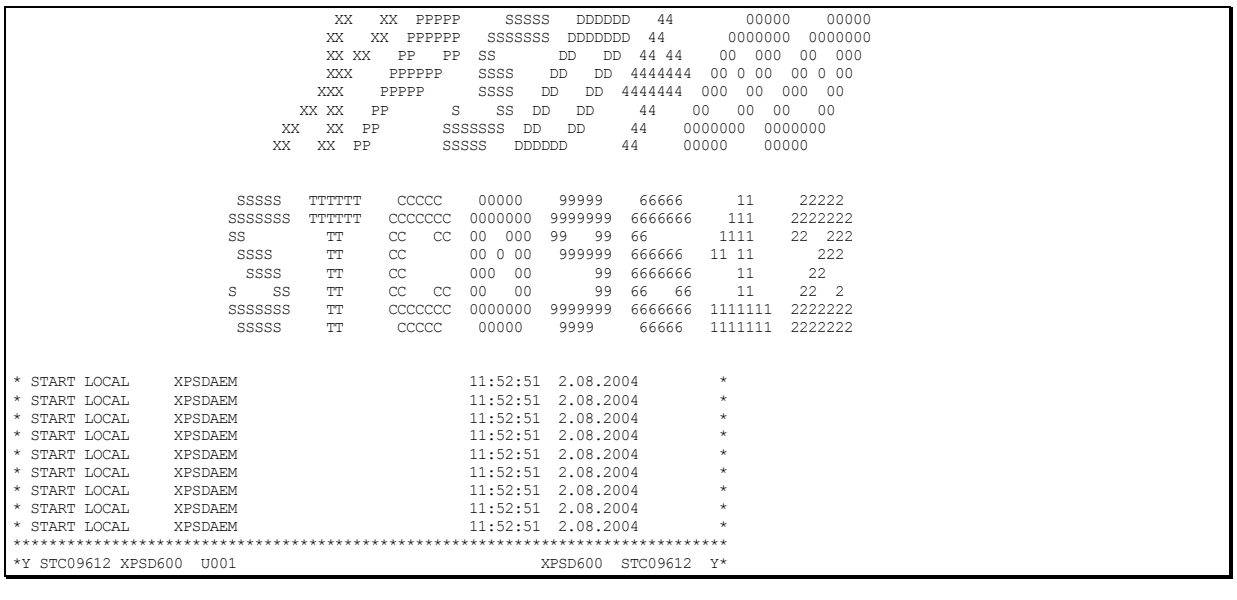
Start separator page 'SEP#S01':

```
**START*****START*****START*****START*****START*****START*****START*****START*****START*****START***
*                                                                                                   *
* JOBID:         STC09530                                                                           *
* JOB NAME:      XPSD600                                                                            *
* USER ID:       XPSDAEM                                                                            *
* SYSOUT CLASS:  Y                                                                                  *
* OUTPUT GROUP:  2.1.1                                                                              *
* TITLE:                                                                                            *
*                                                                                                   *
* NAME:                                                                                             *
* ROOM:                                                                                             *
* BUILDING:                                                                                         *
* DEPARTMENT:                                                                                       *
* ADDRESS:                                                                                          *
*                                                                                                   *
*                                                                                                   *
*                                                                                                   *
* PRINT TIME:    11:39:36                                                                           *
* PRINT DATE:     2.08.2004                                                                         *
* PRINTER NAME:  U001                                                                               *
* SYSTEM:        SYS1                                                                               *
*                                                                                                   *
**START*****START*****START*****START*****START*****START*****START*****START*****START*****START***


          X         XX  PPPPPPPPPPP    SSSSSSSSSS   DDDDDDDDD    44        44    00000000      00000000
          XX       XX   PPPPPPPPPPPP  SSSSSSSSSSS  DDDDDDDDDD   44        44   0000000000    0000000000
           XX     XX    PP        PP  SS        SS  DD        DD  44        44  00      0000  00      0000
            XX   XX     PP        PP  SS            DD        DD  44        44  00     00 00  00     00 00
             XX XX      PP        PP  SSS           DD        DD  44        44  00    00  00  00    00  00
              XXX       PPPPPPPPPPP   SSSSSSSS     DD        DD  444444444444  00   00   00  00   00   00
              XXX       PPPPPPPPPP     SSSSSSSS    DD        DD  444444444444  00  00    00  00  00    00
             XX XX      PP                   SSS  DD        DD            44  00 00     00  00 00     00
            XX   XX     PP                    SS  DD        DD            44  0000      00  0000      00
           XX     XX    PP            SS      SS  DD        DD            44  000       00  000       00
          XX       XX   PP            SSSSSSSSSSS  DDDDDDDDDD             44   0000000000    0000000000
          X         XX  PP             SSSSSSSSS   DDDDDDDDD              44    00000000      00000000

    SSSSSSSSSS   TTTTTTTTTTT   CCCCCCCCCC     00000000     9999999999   5555555555   3333333333     00000000
   SSSSSSSSSSS  TTTTTTTTTTT  CCCCCCCCCCCC   0000000000   9999999999  5555555555  333333333333   0000000000
   SS        SS       TT      CC        CC  00      0000  99        99  55             33        33  00      0000
   SS                 TT      CC        CC  00     00 00  99        99  55                       33  00     00 00
   SSS                TT      CC            00    00  00  99        99  55                       33  00    00  00
    SSSSSSSS          TT      CC            00   00   00  999999999999  5555555555           3333   00   00   00
     SSSSSSSS         TT      CC            00  00    00   99999999999  55555555555          3333   00  00    00
         SSS          TT      CC            00 00     00            99           55           33  00 00     00
          SS          TT      CC        CC  0000      00            99           55           33  0000      00
   SS        SS       TT      CC        CC  000       00  99        99  55        55  33        33  000       00
   SSSSSSSSSSS        TT      CCCCCCCCCCCC   0000000000   9999999999  55555555555  333333333333   0000000000
    SSSSSSSSS         TT       CCCCCCCCCC     00000000     9999999999   555555555    3333333333     00000000
```

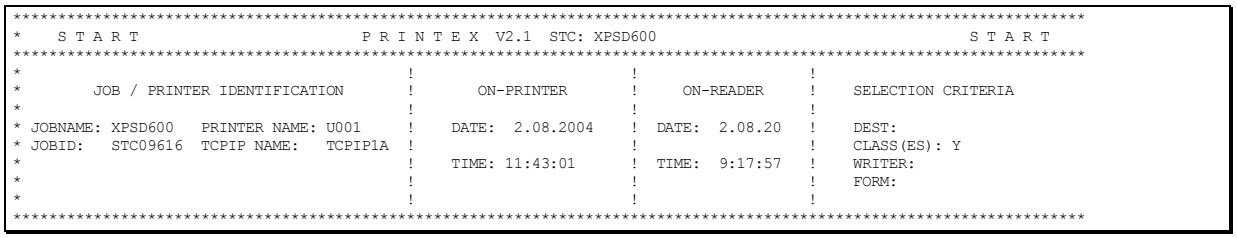
Start separator page 'SEP#S02':



Start separator page 'SEP#S03':



Start separator page 'SEP#S04':



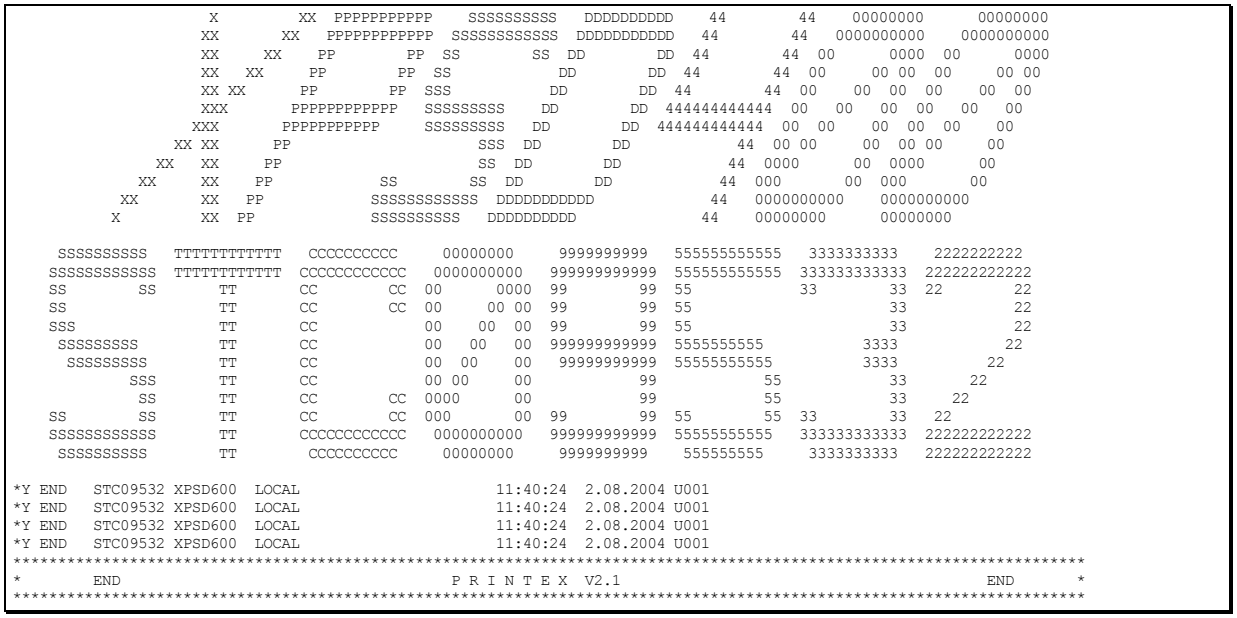
Start separator page 'SEP#S05':

```
*******************************************************************************
*                        !                  !             !
*     JOB/PRINTER ID     !    ON-PRINTER    ! ON-READER   !    SELECTION
*                        !                  !             !     CRITERIA
*                        !                  !             !
* JOBNAME:       XPSD600  ! DATE:  2.08.2004 !  2.08.20    ! DEST:
* JOBID:         STC09609 !                  !             ! CLASS(ES): Y
* PRINTER NAME:  U001     ! TIME: 11:43:20   !  8:43:15    ! WRITER:
* TCPIP NAME:    TCPIP1A  !                  !             ! FORM:
*                        !                  !             !
*******************************************************************************
```

End separator page 'SEP#E01':

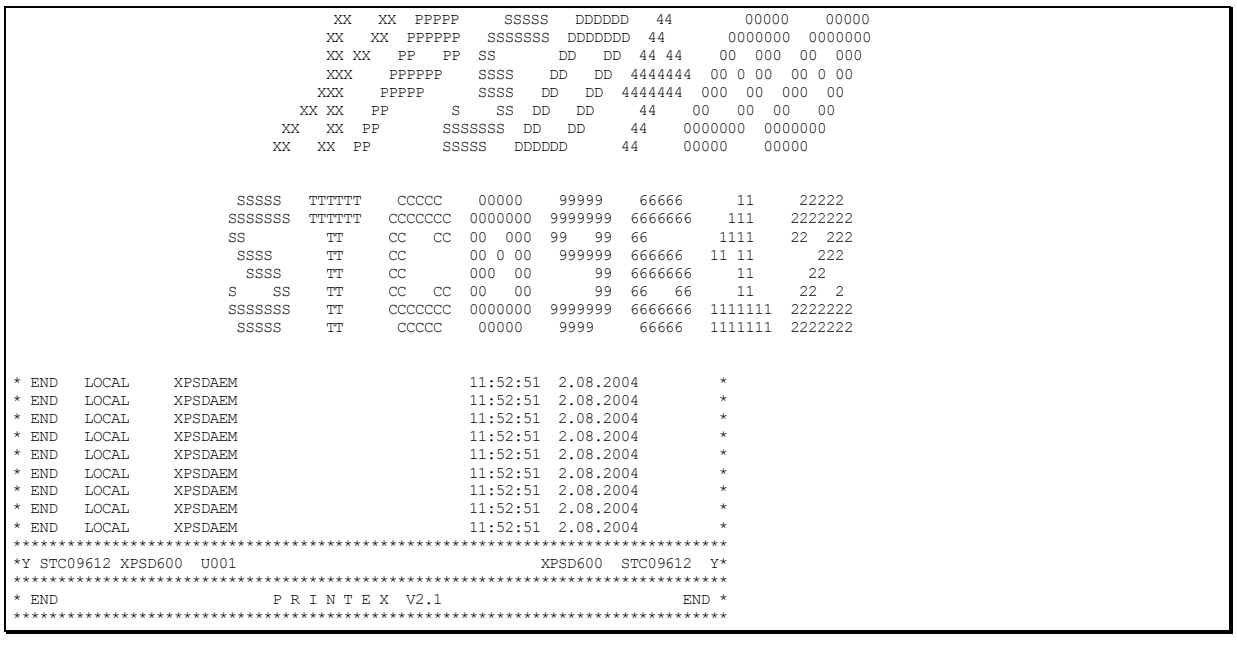
```
***END*******END*******END*******END*******END*******END*******END*******END*******END*******END****
*                                                                                                    *
* JOBID:         STC09530                                                                            *
* JOB NAME:      XPSD600                                                                             *
* USER ID:       XPSDAEM                                                                             *
* SYSOUT CLASS:  Y                                                                                   *
* OUTPUT GROUP:  2.1.1                                                                               *
* TITLE:                                                                                             *
*                                                                                                    *
* NAME:                                                                                              *
* ROOM:                                                                                              *
* BUILDING:                                                                                          *
* DEPARTMENT:                                                                                        *
* ADDRESS:                                                                                           *
*                                                                                                    *
*                                                                                                    *
*                                                                                                    *
* PRINT TIME:    11:39:36                                                                            *
* PRINT DATE:     2.08.2004                                                                          *
* PRINTER NAME:  U001                                                                                *
* SYSTEM:        SYS1                                                                                *
*                                                                                                    *
***END*******END*******END*******END*******END*******END*******END*******END*******END*******END****

          X         XX  PPPPPPPPPPP    SSSSSSSSSS   DDDDDDDDDD    44        44    00000000      00000000
          XX       XX   PPPPPPPPPPPP  SSSSSSSSSSS  DDDDDDDDDDD   44        44   0000000000    0000000000
           XX     XX    PP        PP  SS        SS  DD        DD  44        44  00      0000  00      0000
            XX   XX     PP        PP  SS            DD        DD  44        44  00     00 00  00     00 00
             XX XX      PP        PP  SSS           DD        DD  44        44  00    00  00  00    00  00
              XXX       PPPPPPPPPPP   SSSSSSSS     DD        DD  444444444444  00   00   00  00   00   00
              XXX       PPPPPPPPPP     SSSSSSSS   DD        DD  444444444444  00  00    00  00  00    00
             XX XX      PP                   SSS  DD        DD            44  00 00     00  00 00     00
            XX   XX     PP                    SS  DD        DD            44  0000      00  0000      00
           XX     XX    PP            SS      SS  DD        DD            44  000       00  000       00
          XX       XX   PP            SSSSSSSSSS  DDDDDDDDDD             44   0000000000    0000000000
          X         XX  PP             SSSSSSSSS  DDDDDDDDD              44    00000000      00000000

    SSSSSSSSSS   TTTTTTTTTTT   CCCCCCCCCC     00000000     9999999999   555555555555   3333333333     00000000
   SSSSSSSSSSS  TTTTTTTTTTT  CCCCCCCCCCCC   0000000000   999999999999  555555555555  333333333333   0000000000
   SS        SS      TT      CC        CC  00      0000  99        99  55            33        33  00      0000
   SS                TT      CC        CC  00     00 00  99        99  55                      33  00     00 00
   SSS               TT      CC            00    00  00  99        99  55                      33  00    00  00
    SSSSSSSSS        TT      CC            00   00   00  999999999999  5555555555           3333   00   00   00
     SSSSSSSSS       TT      CC            00  00    00   99999999999  55555555555          3333   00  00    00
         SSS         TT      CC            00 00     00            99            55            33  00 00     00
          SS         TT      CC        CC  0000      00            99            55            33  0000      00
   SS        SS      TT      CC        CC  000       00  99        99  55        55  33        33  000       00
   SSSSSSSSSSS       TT      CCCCCCCCCCCC   0000000000   999999999999  55555555555  333333333333   0000000000
    SSSSSSSSS        TT       CCCCCCCCCC     00000000     9999999999    555555555    3333333333     00000000E
```

End separator page 'SEP#E02':



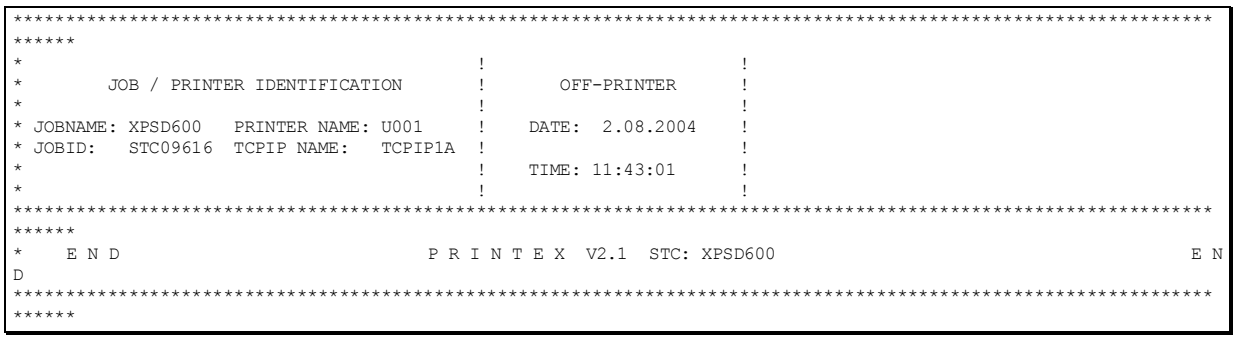
```
                    X         XX  PPPPPPPPPP    SSSSSSSSSS   DDDDDDDDD    44        44    00000000      00000000
                   XX       XX   PPPPPPPPPPP  SSSSSSSSSSS  DDDDDDDDDD   44        44   0000000000    0000000000
                   XX     XX    PP        PP  SS        SS  DD        DD  44        44  00      0000  00      0000
                   XX   XX     PP        PP  SS            DD        DD  44        44  00     00 00  00     00 00
                   XX XX       PP        PP  SSS           DD        DD  44        44  00     00  00  00     00  00
                   XXX         PPPPPPPPPPP   SSSSSSSSS     DD        DD  444444444444  00   00   00  00   00   00
                  XXX          PPPPPPPPPP    SSSSSSSSS     DD        DD  444444444444  00  00    00  00  00    00
                 XX XX         PP                  SSS  DD        DD           44  00 00     00  00 00     00
               XX   XX         PP                   SS  DD        DD           44  0000      00  0000      00
             XX     XX        PP             SS        SS  DD        DD           44  000       00  000       00
           XX       XX        PP             SSSSSSSSSSS  DDDDDDDDDD            44   0000000000    0000000000
          X         XX  PP     PP             SSSSSSSSSS   DDDDDDDDDD            44    00000000      00000000

     SSSSSSSSSS   TTTTTTTTTTT   CCCCCCCCCC     00000000     9999999999   555555555555   3333333333    2222222222
    SSSSSSSSSSS  TTTTTTTTTTT  CCCCCCCCCCCC   0000000000   999999999999  555555555555  333333333333  222222222222
    SS        SS       TT       CC         CC  00      0000  99        99  55             33        33  22        22
    SS                 TT       CC         CC  00      00 00  99        99  55                       33            22
    SSS                TT       CC             00    00  00  99        99  55                       33            22
     SSSSSSSSS         TT       CC             00   00   00  999999999999  5555555555           3333           22
       SSSSSSSS        TT       CC             00  00    00   99999999999  55555555555          3333         22
            SSS        TT       CC             00 00     00             99           55            33       22
              SS       TT       CC         CC  0000      00             99           55            33     22
    SS        SS       TT       CC         CC  000       00  99        99  55        55  33        33   22
    SSSSSSSSSSS        TT       CCCCCCCCCCCC   0000000000   999999999999  55555555555   333333333333  222222222222
     SSSSSSSSS         TT        CCCCCCCCCC     00000000     9999999999    555555555     3333333333   222222222222

*Y END   STC09532 XPSD600  LOCAL                    11:40:24  2.08.2004 U001
*Y END   STC09532 XPSD600  LOCAL                    11:40:24  2.08.2004 U001
*Y END   STC09532 XPSD600  LOCAL                    11:40:24  2.08.2004 U001
*Y END   STC09532 XPSD600  LOCAL                    11:40:24  2.08.2004 U001
*****************************************************************************************************************
*        END                                  P R I N T E X  V2.1                                          END      *
*****************************************************************************************************************
```

End separator page 'SEP#E03':



```
                                XX   XX  PPPPP     SSSSS   DDDDDD   44        00000    00000
                               XX   XX  PPPPPP   SSSSSSS  DDDDDDD  44       0000000  0000000
                               XX XX   PP   PP  SS       DD   DD  44 44    00  000  00  000
                               XXX     PPPPPP    SSSS    DD   DD  4444444  00 0 00  00 0 00
                              XXX      PPPPP       SSSS   DD   DD  4444444  000  00  000  00
                             XX XX   PP       S     SS  DD   DD     44    00   00  00   00
                            XX   XX  PP       SSSSSSS  DD   DD     44    0000000  0000000
                           XX   XX  PP        SSSSS   DDDDDD      44     00000    00000


                        SSSSS   TTTTTT    CCCCC    00000    99999    66666      11     22222
                       SSSSSSS  TTTTTT   CCCCCCC  0000000  9999999  6666666    111    2222222
                       SS         TT     CC   CC  00  000  99   99  66        1111    22  222
                        SSSS      TT     CC       00 0 00   999999  666666   11 11       222
                          SSSS    TT     CC       000  00       99  6666666     11      22
                       S    SS    TT     CC   CC  00   00       99  66   66     11     22  2
                       SSSSSSS    TT     CCCCCCC  0000000  9999999  6666666  1111111  2222222
                        SSSSS     TT      CCCCC    00000    9999     66666   1111111  2222222


* END   LOCAL     XPSDAEM                         11:52:51  2.08.2004        *
* END   LOCAL     XPSDAEM                         11:52:51  2.08.2004        *
* END   LOCAL     XPSDAEM                         11:52:51  2.08.2004        *
* END   LOCAL     XPSDAEM                         11:52:51  2.08.2004        *
* END   LOCAL     XPSDAEM                         11:52:51  2.08.2004        *
* END   LOCAL     XPSDAEM                         11:52:51  2.08.2004        *
* END   LOCAL     XPSDAEM                         11:52:51  2.08.2004        *
* END   LOCAL     XPSDAEM                         11:52:51  2.08.2004        *
* END   LOCAL     XPSDAEM                         11:52:51  2.08.2004        *
*****************************************************************************
*Y STC09612 XPSD600  U001                                XPSD600  STC09612  Y*
*****************************************************************************
* END                      P R I N T E X  V2.1                            END *
*****************************************************************************
```

End separator page 'SEP#E04':



```
*****************************************************************************************************************
******
*                                        !                        !
*        JOB / PRINTER IDENTIFICATION    !       OFF-PRINTER      !
*                                        !                        !
* JOBNAME: XPSD600   PRINTER NAME: U001  !    DATE:  2.08.2004    !
* JOBID:   STC09616  TCPIP NAME:   TCPIP1A  !                      !
*                                        !    TIME: 11:43:01      !
*                                        !                        !
*****************************************************************************************************************
******
*    E N D                           P R I N T E X  V2.1  STC: XPSD600                                      E N
D
*****************************************************************************************************************
******
```

End separator page 'SEP#E05':

```
*******************************************************************************
*                        !                  !
*     JOB/PRINTER ID     !    OFF-PRINTER   !
*                        !                  !
* JOBNAME:       XPSD600  ! DATE:  2.08.2004 !
* JOBID:         STC09609 !                  !
* PRINTER NAME:  U001     ! TIME: 11:43:20   !
* TCPIP NAME:    TCPIP1A  !                  !
*                        !                  !
*******************************************************************************
*  E N D             P R I N T E X  V2.1  STC: XPSD600               E N D  *
*******************************************************************************
```

The standard separator pages can be modified in order to meet installation dependent requirements.

Additionally it is possible to create any number of new separator pages. The following table contains the variables that can be used in order to design new separator pages.

Variable	Description
#BIG	12-line capital letters
#BIGITALIC	12-line capital letters italic
#SMALL	8-line letters
#SMALLITALIC	8-line letters italic
#HALF	6-line letters
#HALFITALIC	6-line letters italic
&NP	New page
&NL	New line
&2L	2 new lines
&3L	3 new lines
&JOBID	Job id
&JOBNAME	Job name
&USERID	User id
&CLASS	Sysout class
&GROUP	Sysout group
&DEST	Destination
&WRITER	External writer
&FORM	Form
&FCB	FCB
&STEP	Step name
&PROG	Program name
&SYSTEM	Sub system name
The next 4 variables refer to the output statement **`ADDRESS=('ZIP', 'CITY', 'STREET', 'HOUSE NUMBER')`**	

&ADDR#1	Zip	
&ADDR#2	City	
&ADDR#3	Street	
&ADDR#4	Street number	
&BUILD	Value of output statement	**BUILDING='BUILDING'**
&DEPT	Value of output statement	**DEPT='DEPARTMENT'**
&NAME	Value of output statement	**NAME='NAME'**
&ROOM	Value of output statement	**ROOM='ROOM'**
&TITLE	Value of output statement	**TITLE='TITLE'**
&UDATA	Value of output statement	**USERDATA='DATA'**
&TIME	Printing time	
&DATE	Printing date	
&PRINTER	PrintEx printer name	
&SDEST	PrintEx selection destination	
&SCLASS	PrintEx selection class	
&SWRITER	PrintEx selection writer	
&SFORM	PrintEx slection form	
&STCNAME	Started task name	
&JOBTIME	Job time	
&JOBDATE	Job date	
&TCPIP	TCP/IP name	
&LINES	Number of lines	
&PAGES	Number of pages	
<n>	Position on column n	
(n)	Repeat the following string n times	

Comment lines can be inserted into a separator page text by entering the asterisk character '*' in the first column. If a definition is longer than one line the continuation character 'X' has to be entered in column 72.

The following figure shows an example of a simple separator page.

```
&NP,(10)'***END****'
&NL,'*'<100>'*'
&3L,#BIG.&JOBNAME
&3L,#BIGITALIC.'TEST'
&2L,#SMALL.&JOBID
&NL,'*'<100>'*'
&NL,(10)'***END****'
```

Fig. 57: Separator page example

This will result in the following separator page:

```
***END*******END*******END*******END*******END*******END*******END*******END*******END*******END****
*                                                                                                     *


    X         XX  PPPPPPPPPPP    SSSSSSSSSS    SSSSSSSSSS   DDDDDDDDD    IIIIIIIIIII  RRRRRRRRRR   MM         MM
    XX       XX   PPPPPPPPPPPP  SSSSSSSSSSS  SSSSSSSSSSS  DDDDDDDDDD   IIIIIIIIIII  RRRRRRRRRRR  MMM       MMM
     XX     XX    PP         PP SS         SS SS         SS DD        DD       II       RR        RR  MMMM    MMMM
      XX   XX     PP         PP SS            SS         SS DD        DD       II       RR        RR  MM MM  MM MM
       XX XX      PP         PP SSS           SSS        SS DD        DD       II       RR        RR  MM  MMMM  MM
        XXX       PPPPPPPPPPPP   SSSSSSSSS     SSSSSSSSS   DD        DD       II       RRRRRRRRRRR  MM   MM   MM
        XXX       PPPPPPPPPPP     SSSSSSSSS     SSSSSSSSS  DD        DD       II       RRRRRRRRRR   MM         MM
       XX XX      PP                    SSS          SSS  DD        DD       II       RR    RR     MM         MM
      XX   XX     PP                     SS           SS  DD        DD       II       RR     RR    MM         MM
     XX     XX    PP            SS       SS  SS        SS  DD        DD       II       RR      RR   MM         MM
    XX       XX   PP           SSSSSSSSSSS  SSSSSSSSSSS  DDDDDDDDDD   IIIIIIIIIII  RR       RR  MM         MM
    X         XX  PP            SSSSSSSSS    SSSSSSSSS   DDDDDDDDD    IIIIIIIIIII  RR        RR MM         MM


                                      TTTTTTTTTTT  EEEEEEEEEEE   SSSSSSSSS   TTTTTTTTTTT
                                     TTTTTTTTTTT  EEEEEEEEEEE  SSSSSSSSSS  TTTTTTTTTTT
                                        TT       EE           SS        SS       TT
                                       TT       EE           SS                 TT
                                      TT       EE           SSS                TT
                                     TT       EEEEEEEEEE    SSSSSSSS          TT
                                    TT       EEEEEEEEEE     SSSSSSSS         TT
                                   TT       EE                    SSS       TT
                                  TT       EE                     SS       TT
                                 TT       EE           SS        SS       TT
                                TT       EEEEEEEEEE  SSSSSSSSSS       TT
                               TT       EEEEEEEEEE   SSSSSSSSS        TT

                     JJJJJJJ   OOOOO   BBBBBB    00000    99999    00000   5555555     11
                     JJJJJJJ  OOOOOOO  BBBBBBB  0000000  9999999  0000000  5555555    111
                        JJ    OO   OO  BB   BB  00  000  99   99  00  000  55        1111
                        JJ    OO   OO  BBBBBB   00 0 00   999999  00 0 00  555555   11 11
                        JJ    OO   OO  BBBBBB   000  00       99  000  00  5555555     11
                     JJ JJ    OO   OO  BB   BB  00   00       99  00   00       55     11
                     JJJJJ    OOOOOOO  BBBBBBB  0000000  9999999  0000000  5555555  1111111
                      JJJ      OOOOO   BBBBBB    00000    9999     00000   555555   1111111
*                                                                                                     *
***END*******END*******END*******END*******END*******END*******END*******END*******END*******END****
```

Chapter

8

Control instructions in the print data stream

While processing print output from JES as well as from VTAM, PrintEx searches the data stream for special control instructions. Control instructions can be used, e. g., to split an output list into multiple partial lists.

If, for example, is is required to send an output list to different e-mail recipients page by page, PrintEx control instructions can be inserted into the output list in order to split the output list into single pages.

Another application for control instructions would be the requirement to assign different parts of an output list to different overlays.

In order to detect control instructions, PrintEx scans the print output for the special control instructions opener string '*$PRINTEX-START'. All data following the opener string will be interpreted as control instructions until the special control instructions terminator string '*$PRINTEX-END' is detected.

All control instructions including the opener and the terminator will only be interpreted by PrintEx and will not appear in the resulting print output.

Description of the control instructions

***$PRINTEX-START** This control instruction denotes the beginning of the control instructions.

DEST= This control instruction can be used to specify a destination for the currently processed print output. The destination specified in the system definition will be ignored.

Mailfrom= If an output list is sent as an e-mail attachment this instruction can be used to specify the sender of the e-mail.

Mailto= If an output list is sent as an e-mail attachment this instruction can be used to specify the receiver of the e-mail.

Mailcc= If an output list is sent as an e-mail attachment this instruction can be used to specify additional receivers of the e-mail.

Prefixdata= This instruction can be used to overwrite the prefix text for the printer. This makes it possible to insert different prefix texts at various positions in the print output enabling, e. g., the use of different virtual overlays.

Suffixdata= This instruction can be used to overwrite the suffix text for the printer.

Formsdata= This instruction can be used to insert a second prefix text for special parts of the output list. Thus it is possible, e. g., to define common parameters for the output list in the standard prefix text and special parameters, for example, the paper tray selection, using this PrintEx control instruction.

Codepage= This instruction can be used to change the code page to be used by PrintEx to translate output data from EBCDIC to ASCII. This option can be useful, e. g., if parts of an output list must be translated into different languages.

***$PRINTEX-END** This control instruction denotes the end of the control instructions.

The following figure shows an example for a simple text containing PrintEx control instructions.

```
*$PRINTEX-START mailto=user1@xps-software.de *$PRINTEX-END
list-1 line-1
list-1 line-2
list-1 line-3
*$PRINTEX-START
mailto=user2a@xps-software.de
mailcc=user2b@xps-software.de
*$PRINTEX-END
list-2 line-1
list-2 line-2
list-2 line-3
*$PRINTEX-START mailto=user3@xps-software.de *$PRINTEX-END
list-3 line-1
list-3 line-2
list-3 line-3
```

Fig. 58: Control instructions example

Chapter

9

Bar codes

Overview

PrintEx makes it possible to embed numerous standard bar codes in the print output. This option is available for generating print output for HP-PCL, PostScript and PDF.

The specification of the bar code data can be made in any PrintEx text file as well as in an application program generating print data. Options are available to specify the size, direction and representation of the diverse bar codes.

Some bar codes make use of check digits. These check digits can be calculated and added either by the application program or automatically by PrintEx.

In order to use bar codes the special PrintEx license code 'BARCODE' must be available.

Integration

In order to embed a bar code in the print data an application program has to insert an eye-chatcher string followed by arbitrary bar code data. The chosen eye-catcher string must be defined in the context of the model definition in the screen map 'Printer character replacement' in the 'Hostdata' column as shown on page 73 and in the screen maps shown below. The call to the barcode generator program along with the required parameters for the program call must be specified in the 'replace with' column.

```
Print data from application program (line from a JES list, control character in '()'):
```

```
(+)%%BARCODE:Count 0123456789 !
```

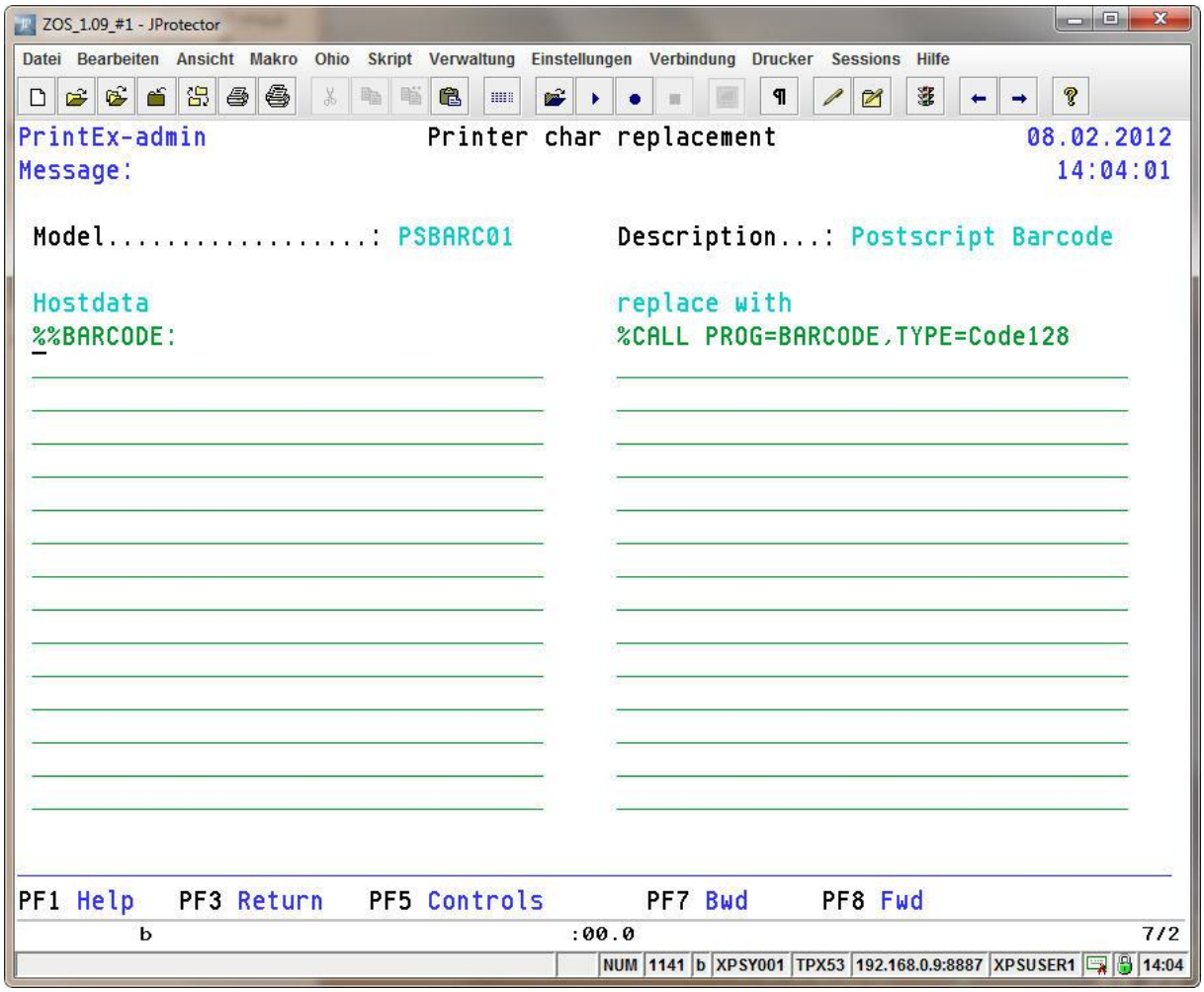


Fig. 59: Define BARCODE via model data

Since the 'replace with' column has only space for a maximum of 35 characters, a reference to a text containing the call to the bar code generator program can be made instead of specifying the program call directly. An example is as shown below:

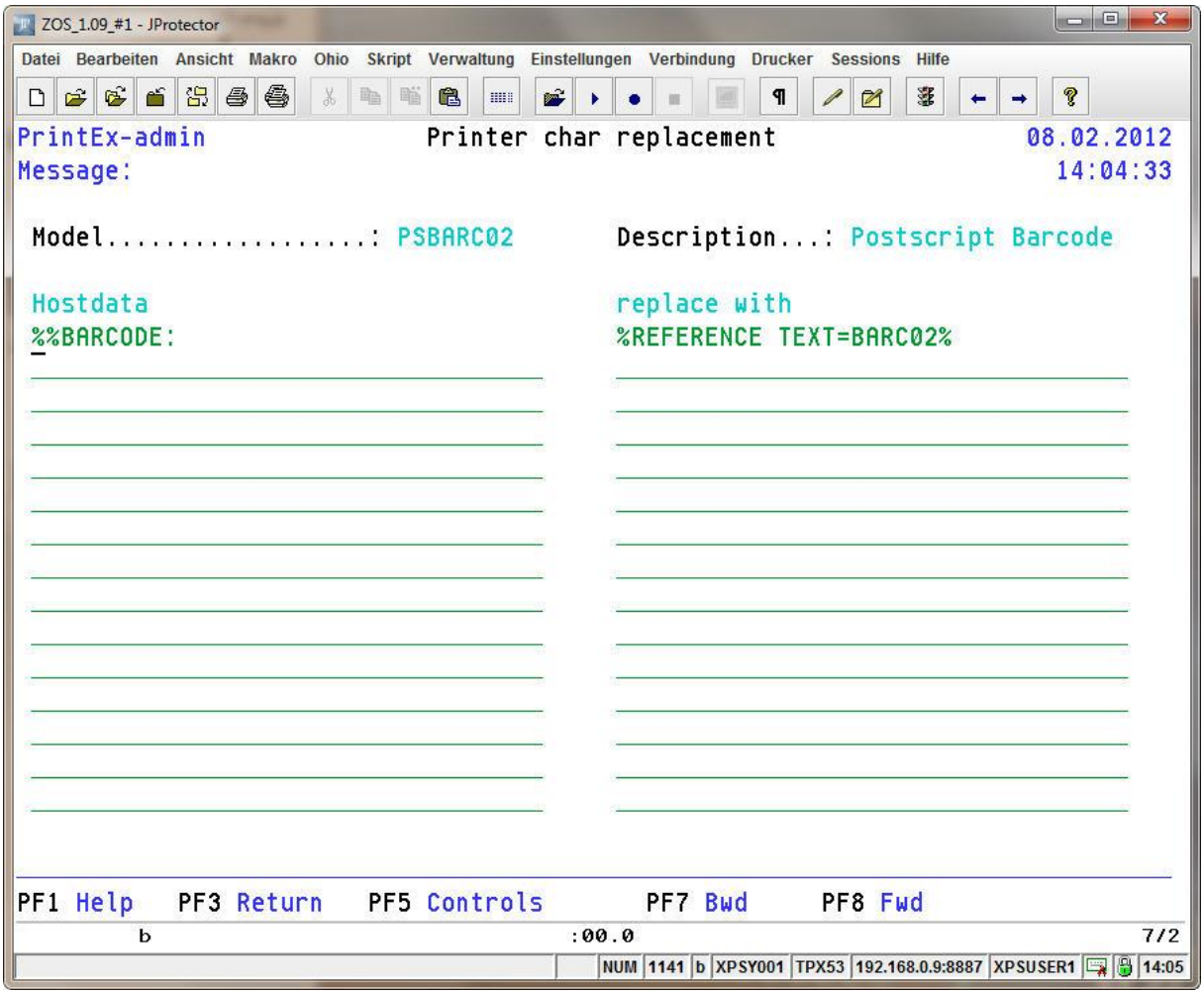


Fig. 60: Define BARCODE via text in model data

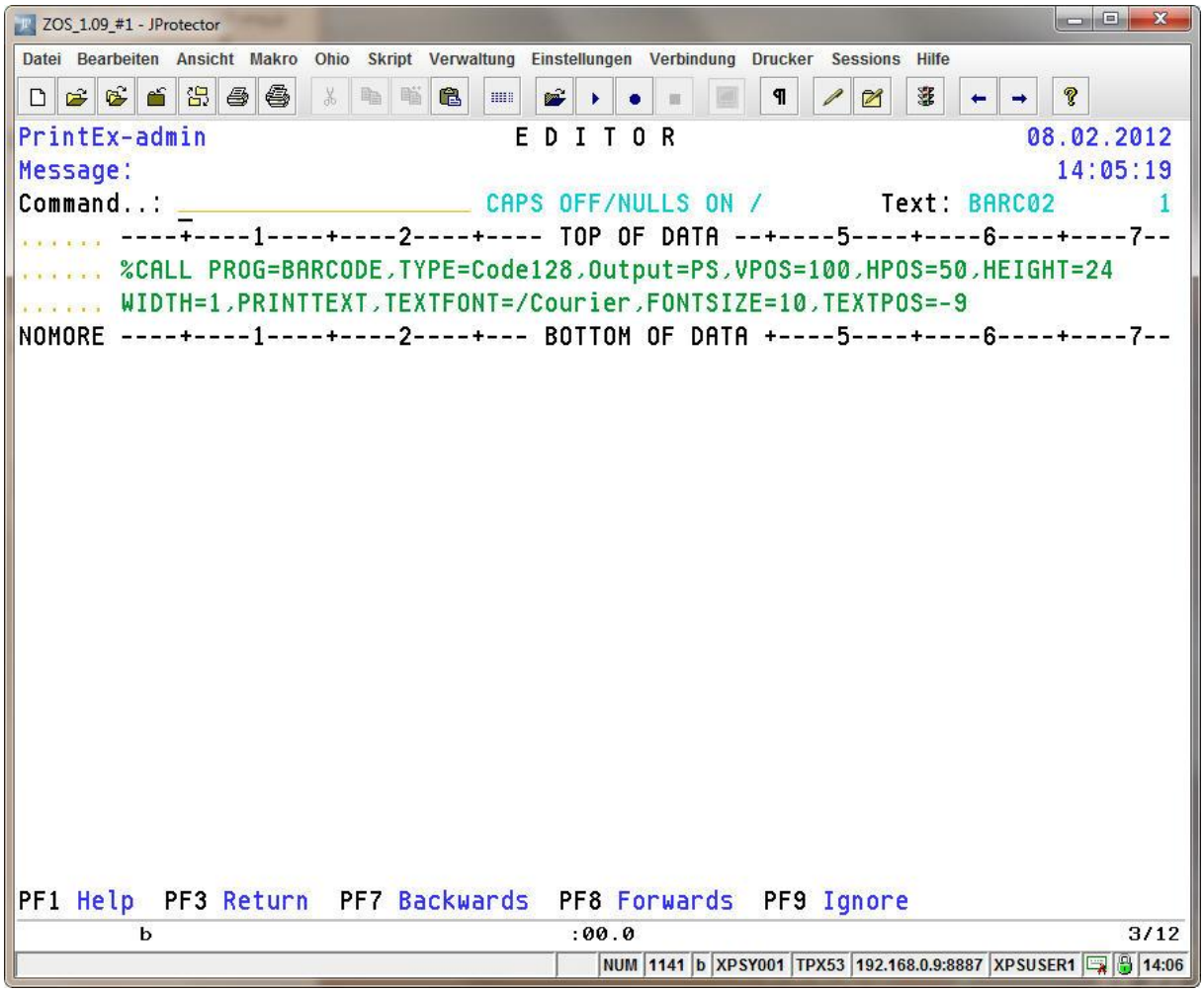


Fig. 61: Define BARCODE via text

Alternatively the required parameters for the call of the bar code generator program can be specified directly in the JES or SNA print data stream created by the application program.

For this the option 'DPARAMEND=' has to be specified in combination with the call to the bar code generator program in the model definition or in the referenced text respectively.

The explicit listing of the bar code parameters must be inserted directly subsequent to the bar code eye-catcher string and must be terminated with the string defined with the 'DPARAMEND=' option. Any bar code data must follow.

```
Print data from application program (line from a JES list, control character in '()'):
```

```
(x'01')%%BARCODE:TYPE=Code128,OUTPUT=PS,VPOS=50,HPOS=400,PRINTTEXT,TEXTFONT=/Courier,
(X'5A')!FONTSIZE=10,TEXTPOS=-9.5,INKSPREAD=0.125,%ENDP:Count 0123456789 !
```

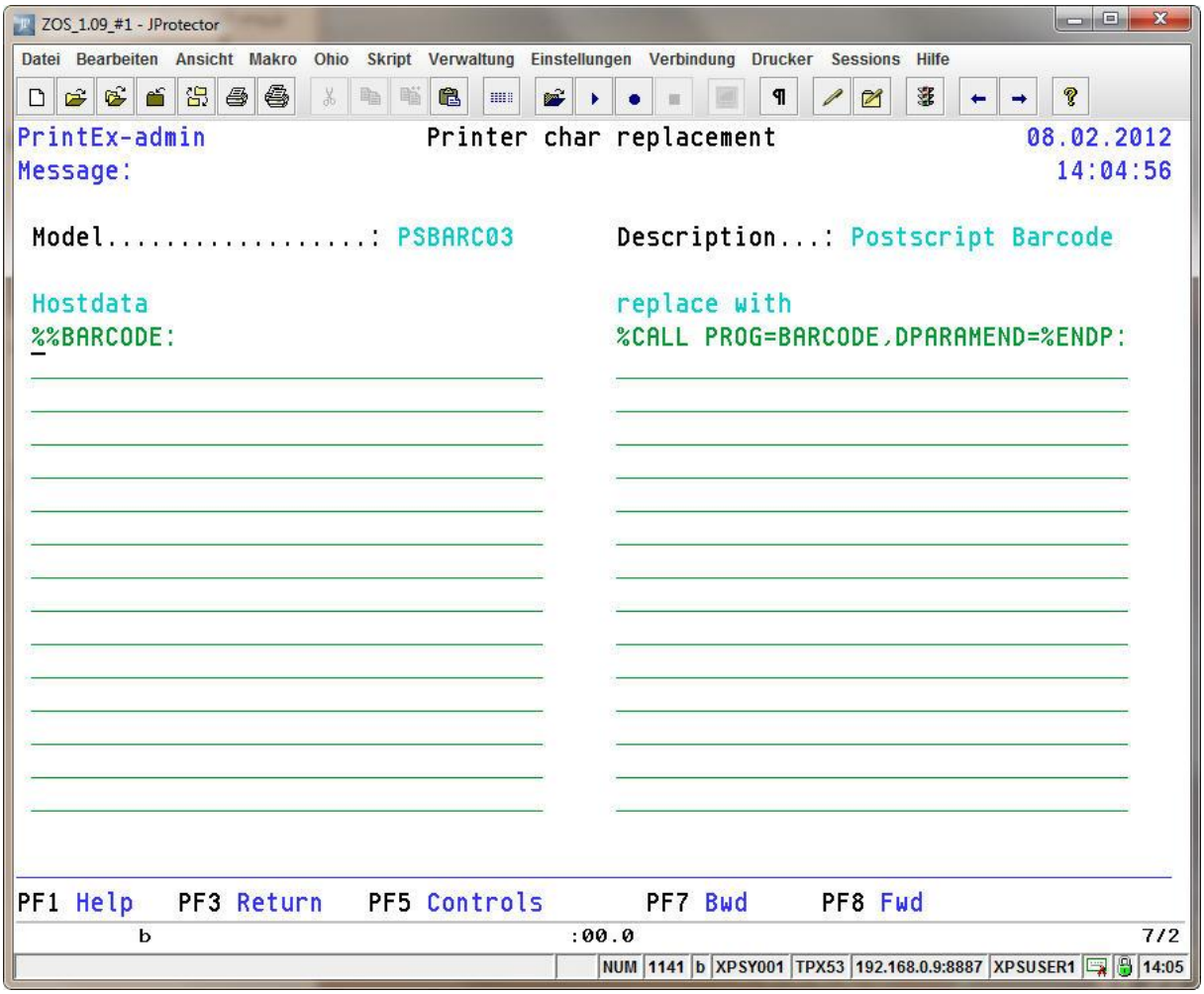


Fig. 62: Define BARCODE – via parameter in print data

Notes:

If bar code control information is specified in a referenced text and in the print data generated by the application program, information generated by the application program will take precedence over information specified in a text.

If print output is generated via JES and the bar code information will be longer than one list line, continuation lines have to be indicated using the control character X'5A' (= char '!') in column 1.

If SNA output is used (e. g. from CICS) the termination of the bar code data has to be indicated using any control character such as X'0D' (carriage return) or X'0A' (new line).

Positioning and rotating bar codes

Since inserting bar code information in a print page will result in a change of the current text position and possibly in a font change, it is suggested to insert bar code information at the end of a print page. In any case it is possible to change the current text position as well as the currently used font to the desired values using the 'RESET=' parameter.

Using the 'ROTATE=' parameter the output direction of the bar code can be defined. This is done by specifying a number of degrees for the rotation. The following values are supported:

Parameter value	Description
0	Bar code will be printed from left to right. This is the default.
90	Bar code will be printed from bottom to top.
180	Bar code will be printed mirrored from right to left.
270	Bar code will be printed from top to bottom.

All positioning information for bar codes relates to the first bar's lower left corner. Furthermore the various coordinate systems as well as the effects of the diverse rotations (parameter 'OUTPUT=') are to be taken input account

PCL:

The origin of the PCL coordinate system is the upper left corner of the page. Rotations will be carried out counterclockwise and the coordinate system will be rotated simultaneously. This makes it necessary to take into account that the page height and the page width will be exchanged for rotations of 90 and 270 degrees. After the bar code has been printed the rotation will be reset to 0 (default).

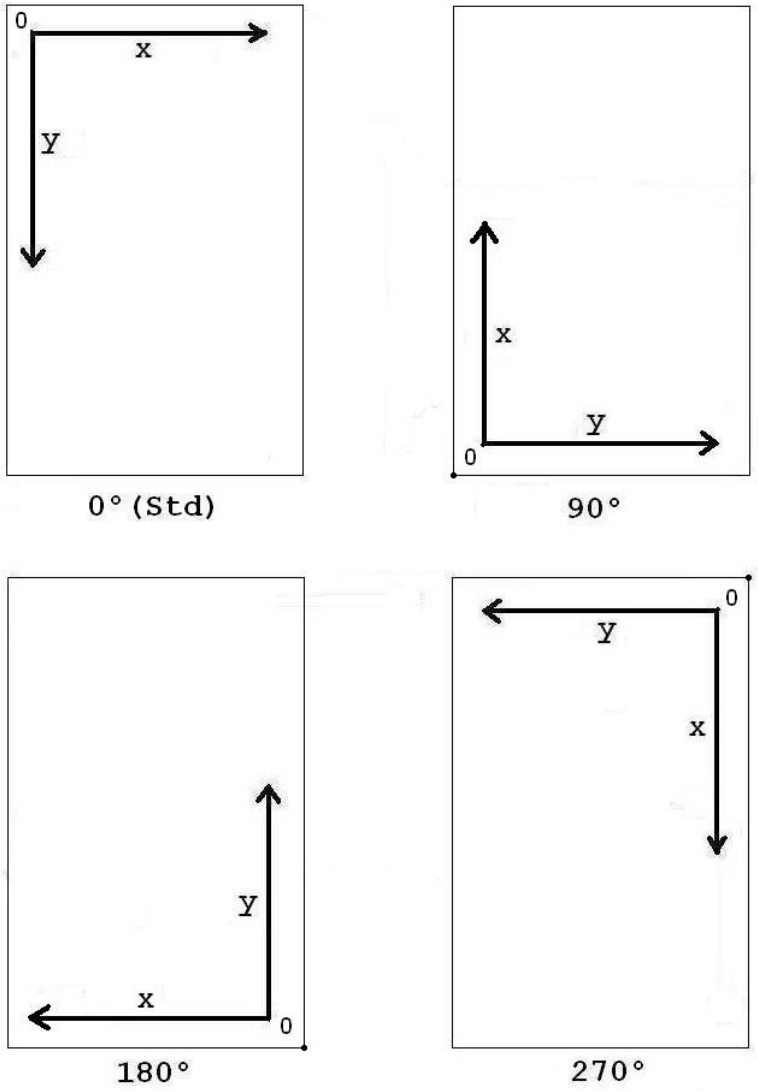


Fig. 63: BARCODE rotation PCL

PS:

The origin of the PostScript coordinate system is the lower left corner of the page. Rotations will be carried out clockwise using a translation matrix. While changing the translation matrix the coordinate system remains unchanged. This has the effect that a rotation of 90 degrees will lead to a positive horizontal position and to a negative vertical position. After a rotation of 180 degress both, the horizontal and the vertical positions will be negative. A rotation of 270 degrees will lead to a negative horizontal position and to a positive vertical position.

Furthermore the page boundaries will be affected. The page height and the page width will be exchanged for rotations of 90 and 270 degrees.

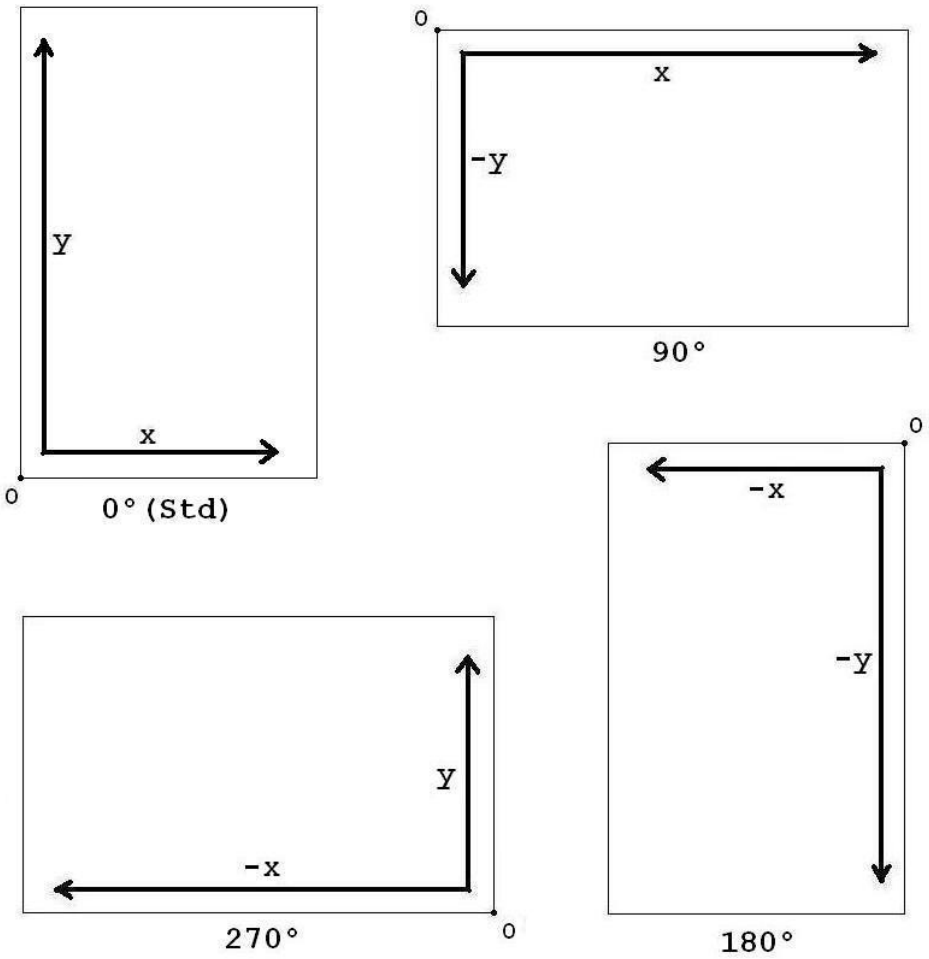


Fig. 64: BARCODE rotation PostScript

PDF:

The origin of the PDF coordinate system is the lower left corner of the page. Rotations can be carried out using the PDF command 'rotate'. The coordinate system remains unchanged. Only the output direction for text output will be affected by rotations of the coordinate system.

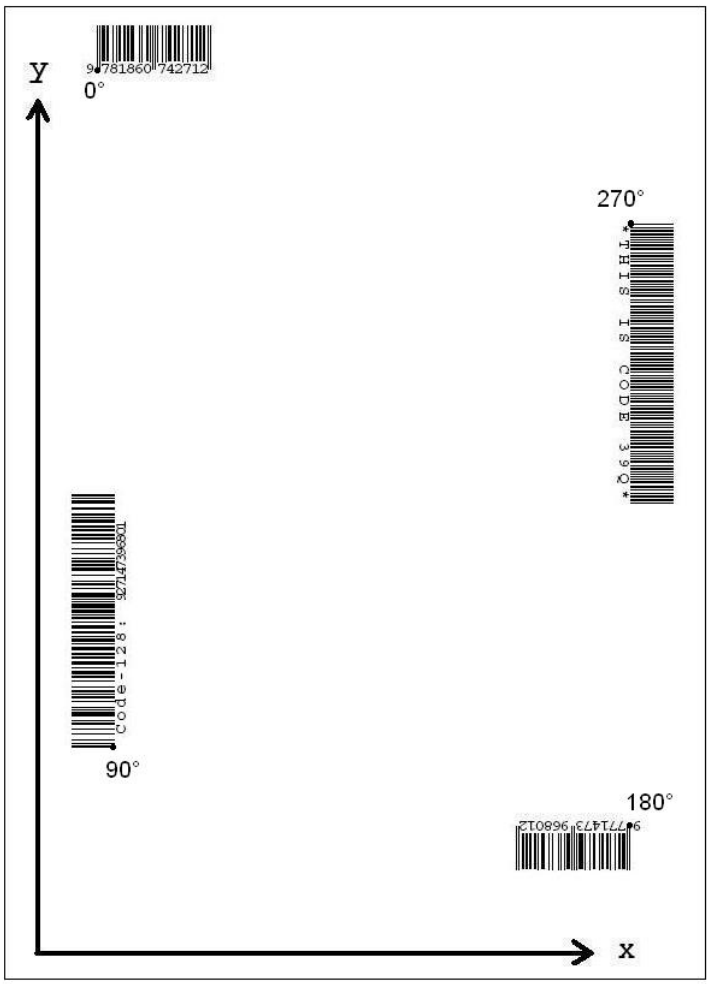


Fig. 65: BARCODE rotation PDF

Global parameters

The representation and the size of the bar code symbol can be controlled using parameters. Multiple parameters are to be separated using a comma or a blank. The following parameters are available for all supported bar code symbols:

Parameter	Default	Description
DPARAMEND=		The value defined with this parameter is used to designate the end of the list of the bar code parameters in the print data stream.
TYPE=		This is the name of the bar code. PrintEx supports all the different bar codes listed below. The notation must be specified exactly as shown: Code128 EAN-13

		EAN-8 EAN-5 EAN-2 ISBN UPC-A UPC-E Standard2of5 Interleaved2of5 MSI Code11 Postnet Codabar Code39 Code93 Plessey Royalmail
OUTPUT=	PS	This is the format of the output. The value specified here must conform to the output format specified for the PrintEx output. PS = PostScript PCL = HP Printer Control Language PDF = Adobe PDF Format
HPOS=		This is the horizontal distance of the the bar code from the left margin in points (= 1/72 inch).
VPOS=		This is the vertical distance of the the bar code from the lower margin in points (= 1/72 inch).
ROTATE=		This is the value for the rotation of the bar code. Valid values are 0, 90, 180 and 270.
HEIGHT=	24	This is the height of the bar code in points (= 1/72 inch).
WIDTH=	1	This is the width of the smallest bar code entity in points (= 1/72 inch).
INKSPREAD=	0.125	This value will be subtracted from the width of the single bar code bars in order to take into account the diffusion of ink jet printers.
PRINTTEXT		This option is to specify if the printable bar code characters are to be printed.
TEXTFONT=		This is the name of the font to be used to print the bar code characters (maximum of 64 characters). If 'OUTPUT=PCL' is chosen, all other font information such as size and character pitch must be specified here. Escape character sequences can be used in the same way as in prefix and suffix texts and in the context of

		character replacement. Examples: PCL '\e(s3T\e(s0P\e(s18H\e(s9V' PS '/Courier' PDF '/F1' (Name of a font previously defined in a prefix text).
FONTSIZE=	8	This is the font size to be used to print out the bar code symbols. Will be ignored for 'OUTPUT=PCL'.
TEXTPOS=		This is the vertical position of the bar code data relative to the lower edge of the bar code (= 1/72 inch).

Bar code symbols

The 'TYPE=' parameter must be used to choose one of the supported bar codes. The notation of the chosen bar code must be exactly as shown.

Code128

Bar code data: Code128 consists of 3 character sets or character types respectively. The chosen start code determines the character set (subset) to be used. The character set (subset) can be changed in the space of the bar code. The data length is variable.

Check digit: Modulo 103.

Parameter	Default	Description
CHECKDIGIT		The check digit will be calculated and will be appended to the bar code.

Character table: If a subset column consists of two columns, the first column contains the desired output that will be generated by specifying the content of the second column.

Value	Subset A	Subset B	Subset C
0	SP	SP	00
1	!	!	01
2	“	“	02
3	#	#	03
4	$	$	04
5	%	%	05
6	&	&	06
7	’	’	07
8	(	(	08
9	)	)	09
10	*	*	10
11	+	+	11
12	,	,	12

Value	Subset A	Subset B	Subset C
13	-	-	13
14	.	.	14
15	/	/	15
16	0	0	16
17	1	1	17
18	2	2	18
19	3	3	19
20	4	4	20
21	5	5	21
22	6	6	22
23	7	7	23
24	8	8	24
25	9	9	25

Value	Subset A	Subset B	Subset C
26	:	:	26
27	;	;	27
28	<	<	28
29	=	=	29
30	>	>	30
31	?	?	31
32	@	@	32
33	A	A	33
34	B	B	34
35	C	C	35
36	D	D	36
37	E	E	37
38	F	F	38
39	G	G	39
40	H	H	40
41	I	I	41
42	J	J	42
43	K	K	43
44	L	L	44
45	M	M	45
46	N	N	46
47	O	O	47
48	P	P	48
49	Q	Q	49
50	R	R	50
51	S	S	51
52	T	T	52
53	U	U	53
54	V	V	54
55	W	W	55
56	X	X	56
57	Y	Y	57
58	Z	Z	58
59	[	[	59
60	\	\	60
61	]	]	61
62	^	^	62
63	_	_	63
64	NUL >SP	, >SP	64
65	SOH >!	a >!	65
66	STX >“	b >“	66

Value	Subset A	Subset B	Subset C
67	ETX >#	c >#	67
68	EOT >$	d >$	68
69	ENQ >%	e >%	69
70	ACK >&	f >&	70
71	BEL >’	g >’	71
72	BS >(	h >(	72
73	HT >)	i >)	73
74	LF >*	j >*	74
75	VT >+	k >+	75
76	FF >,	l >,	76
77	CR >-	m >-	77
78	SO >.	n >.	78
79	SI >/	o >/	79
80	DLE >0	p >0	80
81	DC1 >1	q >1	81
82	DC2 >2	r >2	82
83	DC3 >3	s >3	83
84	DC4 >4	t >4	84
85	NAK >5	u >5	85
86	SYN >6	v >6	86
87	ETB >7	w >7	87
88	CAN >8	x >8	88
89	EM >9	y >9	89
90	SUB >:	z >:	90
91	ESC >;	{ >;	91
92	FS ><	| ><	92
93	GS >=	} >=	93
94	RS >>	~ >>	94
95	US >?	DEL >?	95
96	FNC3 >@	FNC3 >@	96
97	FNC2 >A	FNC2 >A	97
98	SHIFT >B	SHIFT >B	98
99	Subset C >C	Subset C >C	99
100	Subset B >D	FNC4 >D	Subset B >D
101	FNC4 >E	Subset A >E	Subset A >E
102	FNC1 >F	FNC1 >F	FNC1 >F
103	SUBSET A START CODE >G		
104	SUBSET B START CODE >H		
105	SUBSET C START CODE >I		

Code128 example:

Parameter:

```
TYPE=Code128,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,
PRINTTEXT,TEXTPOS=-9.5,TEXTFONT=/Courier,FONTSIZE=12
```

Data:

```
>HCode 128:>C927147396801
```

Result:

EAN-13

Bar code data: 13 digits from '0' to '9'. Only 12 digits if the check digit of the BARCODE is to be calculated (see parameter 'CHECKDIGIT').

Check digit: Modulo 10.

Additional parameters:

Parameter	Default	Description
TEXTHEIGHT=	9.0	Height of the bar code digits. This parameter is required if the parameter 'PRINTTEXT' is used.
GUARDCHAR		If this parameter is set, the guard character '>' will be printed at the right bar code margin.
GUARDPOS=	TEXTPOS=	This is the vertical position of the guard character relative to the vertical text position.
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.

EAN-13 example:

Parameter:

```
TYPE=EAN-13,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,PRINTTEXT,
TEXTPOS=-4.5,TEXTFONT=/Courier,FONTSIZE=11,GUARDCHAR,GUARDPOS=4.5
```

Data:

```
9771473968012
```

Result:

EAN-8

Bar code data: 8 digits from '0' to '9'. Only 7 digits if the check digit of the BARCODE is to be calculated (see parameter 'CHECKDIGIT').

Check digit: Modulo 10.

Additional parameters:

Parameter	Default	Description
TEXTHEIGHT=	9.0	Height of the bar code digits. This parameter is required if the parameter 'PRINTTEXT' is used.
GUARDCHAR		If this parameter is set, the guard characters '<' and '>' will be printed at the left and at the right bar code margin.
GUARDPOS=	TEXTPOS=	This is the vertical position of the guard characters relative to the vertical text position.
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.

EAN-8 example:

Parameter:

```
TYPE=EAN-8,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,PRINTTEXT,
TEXTPOS=-5.0,TEXTHEIGHT=10,TEXTFONT=/Courier,FONTSIZE=14,GUARDCHAR,GUARDPOS=4.5
```

Data:

```
01335583
```

Result:

EAN-5

This bar code is used as an additional bar code printed right of the main bar code which is of one of the types UPC-A, UPC-E, EAN-13 or EAN-8.

Bar code data: 5 digits from '0' to '9'.

Check digit: Not available.

Additional parameters:

Parameter	Default	Description
GUARDCHAR		If this parameter is set, the guard character '>' will be printed at the right bar code margin.
GUARDPOS=	TEXTPOS=	This is the vertical position of the guard character relative to the vertical text position.

EAN-5 example:

Parameter:

```
TYPE=EAN-5,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=24,WIDTH=1.0,PRINTTEXT,
TEXTPOS=25,TEXTFONT=/Courier,FONTSIZE=12,GUARDCHAR,GUARDPOS=-13,INKSPREAD=0.125
```

Data:

```
90200
```

Result:

EAN-2

This bar code is used as an additional bar code printed right of the main bar code which is of one of the types UPC-A, UPC-E, EAN-13 or EAN-8.

Bar code data: 2 digits from '0' to '9'.

Check digit: Not available.

Additional parameters:

Parameter	Default	Description
GUARDCHAR		If this parameter is set, the guard character '>' will be printed at the right bar code margin.
GUARDPOS=	TEXTPOS=	This is the vertical position of the guard character relative to the vertical text position.

EAN-2 example:

Parameter:

```
TYPE=EAN-2,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=24,WIDTH=1.0,PRINTTEXT,
TEXTPOS=25,TEXTFONT=/Courier,FONTSIZE=12,GUARDCHAR,INKSPREAD=0.125
```

Data:

```
05
```

Result:

UPC-A

Bar code data: 12 digits from '0' to '9'. Only 11 digits if the check digit of the BARCODE is to be calculated (see parameter 'CHECKDIGIT').

Check digit: Modulo 10.

Additional parameters:

Parameter	Default	Description
TEXTHEIGHT=	0	Height of the bar code digits. This parameter is required if the parameter 'PRINTTEXT' is used.
GUARDCHAR		If this parameter is set, the guard character '>' will be printed at the right bar code margin.
GUARDPOS=	TEXTPOS=	This is the vertical position of the guard character relative to the bar code position.
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.

UPC-A example:

Parameter:

```
TYPE=UPC-A,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,PRINTTEXT,CHECKDIGIT,
TEXTPOS=-4.0,TEXTHEIGHT=9.5,TEXTFONT=/Courier,FONTSIZE=12,INKSPREAD=0.125
```

Data:

```
78858101497
```

Result:

UPC-E

Bar code data: 8 digits from '0' to '9'. Only 7 digits if the check digit of the BARCODE is to be calculated (see parameter 'CHECKDIGIT').

Check digit: Modulo 10.

Additional parameters:

Parameter	Default	Description
TEXTHEIGHT=	0	Height of the bar code digits. This parameter is required if the parameter 'PRINTTEXT' is used.
GUARDCHAR		If this parameter is set, the guard character '>' will be printed at the right bar code margin.
GUARDPOS=	TEXTPOS=	This is the vertical position of the guard character relative to the bar code position.
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.

UPC-E example:

Parameter:

```
TYPE=UPC-E,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=24,WIDTH=1.0,PRINTTEXT,CHECKDIGIT,
TEXTPOS=-4.0,TEXTHEIGHT=9.5,TEXTFONT=/Courier,FONTSIZE=12,INKSPREAD=0.125
```

Data:

```
0123456
```

Result:

ISBN

Bar code data: 10 digits from '0' to '9'. Only 9 digits if the check digit of the BARCODE is to be calculated (see parameter 'CHECKDIGIT'). The digits can be separated arbitrarily with the '-' character.

Check digit: Modulo 11.

Additional parameters:

Parameter	Default	Description

TEXTHEIGHT=	0	Height of the bar code digits. This parameter is required if the parameter 'PRINTTEXT' is used.
GUARDCHAR		If this parameter is set, the guard character '>' will be printed at the right bar code margin.
GUARDPOS=	TEXTPOS=	This is the vertical position of the guard character relative to the bar code position.
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the ISBN bar code.
ISBNPOS=		Position of the ISBN description (default = above the bar code symbols).
ISBNFONT=		This is the name of the font to be used to print the ISBN bar code (maximum of 64 characters). If 'OUTPUT=PCL' is chosen, all other font information such as size and character pitch must be specified here. Escape character sequences can be used in the same way as in prefix and suffix texts and in the context of character replacement. Examples: PCL '\e(s4118T\e(s1P\e(s10H\e(s12V' PS '/Courier' PDF '/F2' (Name of a font previously defined in a prefix text).
ISBNFONTSZ=	8	This is the font size to be used to print out the ISBN code. Will be ignored for 'OUTPUT=PCL'.
ISBNPREFIX=	978	The ISBN bar code is based on the EAN-13 bar code. In order to build the bar code the constant value '978' as well as the digits of the ISBN bar code without any check digit will be used. This parameter can be used to change the prefix for the EAN-13 bar code.

ISBN example:

Parameter:

```
TYPE=ISBN,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,PRINTTEXT,
TEXTPOS=-5.0,TEXTHEIGHT=9.5,TEXTFONT=/Courier,FONTSIZE=13,INKSPREAD=0.125,
ISBNFONT=/Courier,ISBNFONTSZ=8
```

Data:

```
1-86074-271-8
```

Result:

Code2of5

This bar code is also known as Code 25 Industrial or as Standard2of25.

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Check digit: Modulo 10 (optional).

Additional parameters:

Parameter	Default	Description
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.
CHECKINTEXT		If this parameter is set the check digit will be printed together with the bar code characters.

Code2of5 example:

Parameter:

```
TYPE=Code2of5,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,CHECKDIGIT,CHECKINTEXT,
PRINTTEXT,TEXTPOS=-9.0,TEXTFONT=/Courier,FONTSIZE=14,INKSPREAD=0.125
```

Data:

```
0123456789
```

Result:

Interleaved2of5

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Note: The resulting number of digits inclusive the optional check digit must be even!

Check digit: Modulo 10 (optional).

Additional parameters:

Parameter	Default	Description
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.
CHECKINTEXT		If this parameter is set the check digit will be printed together with the bar code characters.

Interleaved2of5 example:

Parameter:

```
TYPE=Interleaved2of5,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,CHECKDIGIT,
CHECKINTEXT,PRINTTEXT,TEXTPOS=-9.0,TEXTFONT=/Courier,FONTSIZE=14,INKSPREAD=0.125
```

Data:

```
00123456789
```

Result:

MSI

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Check digit: optional: modulo 10, modulo 11, 2 modulo 10 or modulo 11/modulo 10.

Additional parameters:

Parameter	Default	Description
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.
CHECKINTEXT		If this parameter is set the check digit will be printed together with the bar code characters.
CHECKMTHD=		Method to choose for the calculation of the check digit(s). Mod10 Mod11 2Mod10 Mod11/10 NO

MSI example:

Parameter:

```
TYPE=MSI,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,CHECKDIGIT,
CHECKINTEXT,PRINTTEXT,CHECKMTHD=Mod11/10,
TEXTPOS=-9.0,TEXTFONT=/Courier,FONTSIZE=14,INKSPREAD=0.125
```

Data:

```
00123456789
```

Result:

Plessey

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Check digit: CRC (cyclic redundancy check code) – one or more check digits.

Additional parameters:

Parameter	Default	Description
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.
CHECKINTEXT		If this parameter is set the check digit will be printed together with the bar code characters.

Plessey example:

Parameter:

```
TYPE=Plessey,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,CHECKDIGIT,
PRINTTEXT,TEXTPOS=-9.0,TEXTFONT=/Courier,FONTSIZE=14,INKSPREAD=0.125
```

Data:

```
1234567890
```

Result:

Code11

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Check digit: If there are less than 10 bar code characters, type 'C' (modulo 47) should be used. If 10 or more bar code characters are specified, type 'C' (modulo 47) and type 'K' (modulo 47) should be used.

Additional parameters:

Parameter	Default	Description
CHECKDIGIT		If this parameter is set the check digit will be calculated according to the chosen method and will be appended to the bar code.
CHECKINTEXT		If this parameter is set the check digit will be printed together with the bar code characters.
CHECKMTHD=		Method to choose for the calculation of the check digit(s). C type 'C' check digit C/K type 'C' and type 'K' check digits (10 or more bar code characters) NO no check digit If no input for this parameter is made and the parameter 'CHECKDIGIT' has been set, method 'C' and method 'C/K' for 10 or more characters will be used by default.

Code11 example:

Parameter:

```
TYPE=Code11,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,
CHECKDIGIT,CHECKMTHD=C/K,PRINTTEXT,TXTPOS=-9.0,
TEXTFONT=/Courier,FONTSIZE=14,INKSPREAD=0.125
```

Data:

```
12345678901
```

Result:

Postnet

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Check digit: Modulo 10.

Additional parameters:

Parameter	Defaul	Description
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.
CHECKINTEXT		If this parameter is set the check digit will be printed together with the bar code characters.

Postnet example:

Parameter:

```
TYPE=Postnet,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=18,WIDTH=1.0,CHECKDIGIT,
PRINTTEXT,TEXTFONT=/Courier,FONTSIZE=12,INKSPREAD=0.125
```

Data:

```
12345
```

Result:

Codabar

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Check digitt: Not available.

There are no additional parameters.

Codabar example:

Parameter:

```
TYPE=Codabar,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,PRINTTEXT,
TEXTPOS=-0.8,TEXTFONT=/Courier,FONTSIZE=12,INKSPREAD=0.125
```

Data:

```
A40156B
```

Result:

Code39

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Check digit: Modulo 43 (optional).

Additional parameters:

Parameter	Default	Description
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.
CHECKINTEXT		If this parameter is set the check digit will be printed together with the bar code characters.

Code39 example:

Parameter:

```
TYPE=Code39,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,CHECKDIGIT,
PRINTTEXT,TEXTPOS=-0.8,TEXTFONT=/Courier,FONTSIZE=12,INKSPREAD=0.125
```

Data:

```
Code39-012345
```

Result:

Code93

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Check digit: Type 'C' check digit (modulo 47) and type 'K' check digit (modulo 47).

Additional parameters:

Parameter	Default	Description
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.
CHECKINTEXT		If this parameter is set the check digit will be printed together with the bar code characters.

Code93 example:

Parameter:

```
TYPE=Code93,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=36,WIDTH=1.0,CHECKDIGIT,
PRINTTEXT,TEXTPOS=-0.8,TEXTFONT=/Courier,FONTSIZE=12,INKSPREAD=0.125
```

Data:

```
Code93-Test
```

Result:

Royalmail

Bar code data: Variable number of digits from '0' to '9'. At most 127 characters are supported.

Check digit: Modulo 6 (row/column).

Additional parameters:

Parameter	Default	Description
CHECKDIGIT		If this parameter is set the check digit will be calculated and will be appended to the bar code.
CHECKINTEXT		If this parameter is set the check digit will be printed together with the bar code characters.

Royalmail example:

Parameter:

```
TYPE=Royalmail,OUTPUT=PS,HPOS=50,VPOS=600,HEIGHT=24,WIDTH=2.0,CHECKDIGIT,
PRINTTEXT,TEXTPOS=-0.8,TEXTFONT=/Courier,FONTSIZE=12,INKSPREAD=0.125
```

Data:

```
LE28HS9Z
```

Result:

Chapter

10

PrinTaurus

AKI GmbH, Würzburg, offers an intelligent network output management solution named PrinTaurus. In the context of a cooperation between AKI and XPS, PrintEx from XPS completes the PrinTaurus enterprise suite providing an output management solution for IBM z/OS and IBM z/VSE. This makes AKI available to offer PrinTaurus components for all relevant operating systems.

Integrating PrintEx into the PrinTaurus enterprise suite means a number of advantages for the administrator.

Espescially to mention in this context is the central management of the heterogeneous printer devices environment. The following screenshot shows an excerpt from the PrinTaurus administration GUI:

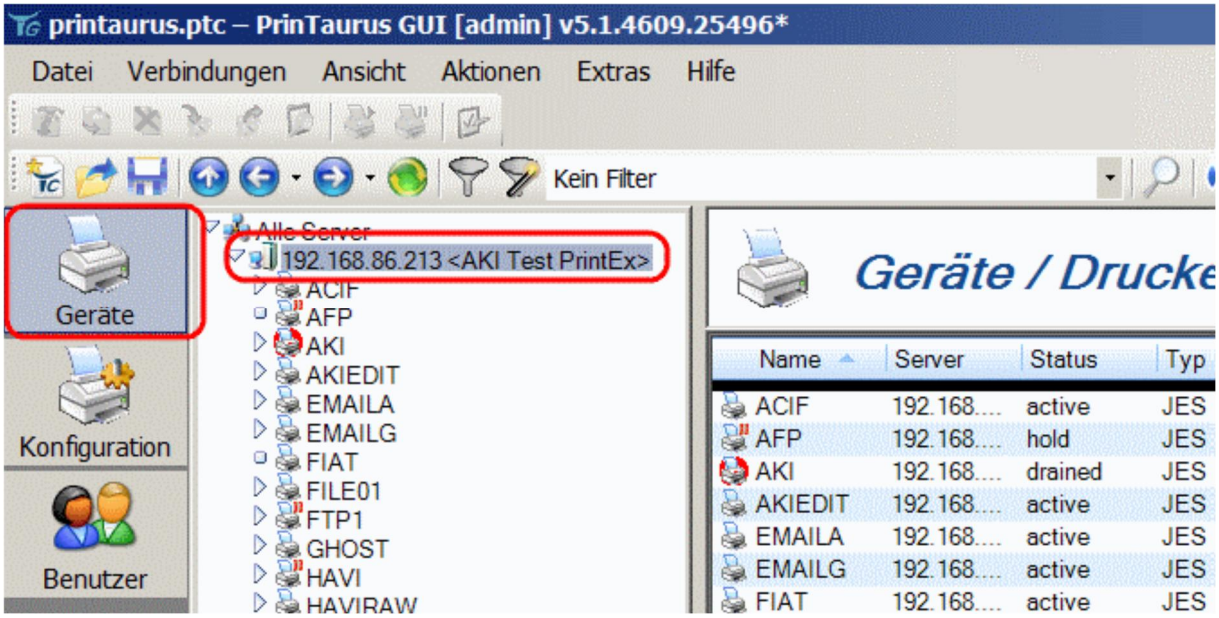


Fig. 66: PrinTaurus – PrintEx GUI Administration

As the figure shows PrintEx can be administered remotely using the PrinTaurus administration GUI. This has the advantage that no direct host access is necessary via a 3270 terminal in order to administer the PrintEx z/OS resources.

Another advantage is the fact that the runtime state of the mainframe printer resources can be monitored centrally from the PrinTaurus GUI. Thus the mainframe printers defined under PrintEx seamlessly join the group of all other printers that are centrally and consistently administered using the PrinTaurus GUI.

Appendix A

Messages

BBIE **MISSING PARAMETERS**

Description: Parameter cards are missing for the function being called.

Action: Correct the entries in the parameter card and rerun XPSVTMNT.

BB01 **FUNCTION #### NOT KNOWN**

Description: A parameter card selects a function, which is not known.

Action: Correct the entries in the parameter card and rerun XPSVTMNT.

BB02 **NUMBER OF LINES MISSING OR NOT NUMERIC**

Description: The number specified in the parameter LPAG is incorrect. The default value of 66 lines is used.

Action: If a line number other than the default 66 is desired, then correct the entries in the LPAG parameter card and rerun XPSVTMNT.

BB03 **PARAMETER INFORMATION TOO LONG**

Description: The information entered for the parameter exceeds the maximum length.

Action: Correct the entries in the parameter card and rerun XPSVTMNT.

BB04 **PARAMETER NOT KNOWN**

Description: A selected parameter is not known.

Action: Correct the parameter and rerun XPSVTMNT.

BB10 **NUMBER HAS MORE THAN 7 DIGITS**

Description: The number has too many digits.

Action: Correct the number entered and rerun XPSVTMNT.

BB11 **PARAMETER IS NOT A NUMBER**

Description: A numeric parameter is expected.

Action: Correct the parameter and rerun XPSVTMNT.

BB12 **TOO MANY PARAMETERS SPECIFIED**

Description: Too many parameters have been entered.

Action: Correct the parameters and rerun XPSVTMNT.

BB16 **INVALID OPTION SPECIFIED**

Description: The option specified is not valid for the parameter.

Action: Correct the parameter option and rerun XPSVTMNT.

BI01 **FILE TOO SMALL (LESS THAN 10 RECORDS)**

Description: The file to be created is too small.

Action: Make the file larger and rerun XPSVTMNT.

BI02 **FILE TOO LARGE FOR STORAGE CONTROL**

Description: The new file to be created is too large.

Action: Make the file smaller and rerun XPSVTMNT.

BK01 **TAPE HAS AN INVALID BACKUP FORMAT**

Description: The tape or cassette entered has an invalid format.

Action: Use a valid PrintEx backup tape and rerun the Restore operation.

CV01 **INVALID PARTITION ID POS=########**

Description: The data stream specifies an invalid implicit partition ID.

Action: Check that the print data is valid and correct at the specified position in the data stream.

CV02 **WSF SCS DATA: INV. READ PARTITION OPER. POS=########**

Description: The data stream uses an invalid operation code.

Action: Check that the print data is valid and correct at the specified position in the data stream.

CV03 **WSF SCS DATA: INV. BEGIN EOF FLAG POS=########**

Description: The data stream uses the command 'Begin EOF' with an unknown flag.

Action: Check that the print data is valid and correct at the specified position in the data stream.

CV04 **WSF: INVALID STRUCTURED FIELD ID POS=########**

Description: The data stream uses a wrong identifier within a 'WRITE STRUCTURED FIELD' command.

Action: Check that the print data is valid and correct at the specified position in the data stream.

CV05 **SCS COMMAND: INVALID DATA LENGTH POS=########**

Description: The data stream has an incorrect length field. The length is larger than the available data.

Action: Check that the print data is valid and correct at the specified position in the data stream.

CV06 **SCS COMMAND: INVALID CHARACTER DISTANCE POS=########**

Description: The data stream has a SCS command 'SCD – Set Character Distance' which uses an invalid entry for the character distance.

Action: Check that the print data is valid and correct at the specified position in the data stream.

CV07 **SCS COMMAND: INVALID LINE DISTANCE POS=########**

Description: The data stream has a SCS command 'SLD – Set Line Distance' which uses an invalid entry for the line distance.

Action: Check that the print data is valid and correct at the specified position in the data stream.

CV08 **DATA DECOMPRESSION ERROR POS=########**

Description: An error occurred when decompressing compressed print data from JES.

Action: Check that the print data is valid and correct at the specified position in the data stream.

CV11 **JES OUTPUT: INVALID CTL CHARACTER POS=######## CC=##**

Description: The print line passed from JES uses an unknown control characters.

Action: Correct the print data to deliver.

CV20 **INVALID INPUT TYPE**

Description: An invalid data type has been passed for the data to convert.

Action: Internal failure. Please notify your XPS sales representative.

CV21 **INVALID OUTPUT TYPE**

Description: An invalid data type has been passed for the data to convert.

Action: Internal failure. Please notify your XPS sales representative.

CV22 **INVALID PDF VARIABLE**

Description: An unknown variable name was used in the controls for the PDF data to print.

Action: Check the data of the model and the text used as suffix data.

CV23 **INVALID PDF OBJECT NR**

Description: In the definition of PDF objects in the prefix data an invalid object number was specified (not numeric).

Action: Check the text of the prefix data.

CV24 **INVALID PDF DEFINITON**

Description: In the definition of PDF objects an object was not correctly closed: 'endobj' was not found.

Action: Correct the error in the prefix data.

CV25 **INVALID PDF OBJECT ENTRY**

Description: In the definition of PDF objects, an error was detected (for example, the beginning of a datastream 'stream' has no corresponding end 'endstream').

Action: Correct the error in the prefix data.

CV26 **OBLIGATE OBJECT MISSING**

Description: In the prefix data for output to a PDF file, an entry is missing for a required PDF object. A required object is of type '/Catalog', '/Page' or '/Pages'.

Action: Check and add the entries for the missing PDF object in the prefix data.

H999 **INFORMATION #### NOT IN BATCH MESSAGE TABLE**

Description: An error occurred, for which a message cannot be found in the PrintEx message table.

Action: Please note the error number and notify your XPS sales representative.

MA01 **Field is not numeric**

Description: A numeric entry is expected.

Action: Correct the entry and rerun the function.

MA02 **Field is not hexadecimal**

Description: A hexadecimal entry is expected.

Action: Correct the entry and rerun the function.

MA03 **Language does not exist**

Description: There is no message module available for the language code entered.

Action: Correct the entry and rerun the function. The default message module installed is XPSVDSG.

MS01 **The logon data is not correct => A signon is rejected!**

Description: The data entered in the PrintEx logon panel is not correct. If the PrintEx security mechanism uses an external system the message pair BVS1/BVS2 will be printed to the system console.

Action: Retry to logon with correct logon data.

MS03 **The new and the old passwords are identical!**

Description: Both entries for the new and the old password are identical.

Action: Repeat the logon to PrintEx specifying a new password not identical to the old password.

MS04 **Confirmation of the new password is missing!**

Description: A confirmation of the new password by the user is missing.

Action: Repeat the logon to PrintEx.

MS05 **The new password and the confirmation are not identical!**

Description: The new password and the confirmation are not identical.

Action: Repeat the logon to PrintEx specifying the confirmation password identical to the new password..

MS07 **A password must be entered for logon**

Description: A user must enter a password to log on to PrintEx. This message is issued when the logon is performed using the option 'USERID' in the logon parameter 'DATA'. It is not possible to specify a password when logging on with the option 'USERID'.

Action: Retry to log on by using the PrintEx logon panel. If the logon is required by using the option 'USERID', then change the user definition to require no password.

MS10 **An entry for a new password is missing**

Description: When logging on to PrintEx, the user did not enter a new password, although the system has notified that the currenct password is no longer valid.

Action: Enter a new password and confirm the entry in the PrintEx logon panel.

MS12 **The password is no longer valid**

Description: When logging on to PrintEx, the system detects that the password has expired.

Action: Enter a new password and confirm the entry in the PrintEx logon panel.

MS13 **The new password is not valid**

Description: The user password entered when logging on to PrintEx has been rejected as invalid by an external security system.

Action: Enter the password conforming to the rules of the installation and repeat the logon.

M602 **Please enter the new name**

Description: PrintEx expects a new name in order to rename the entry.

Action: Enter the new name.

M603 **Confirm the delete by pressing ENTER**

Description: An attempt has been made to delete an entry.

Action: Confirm the delete action by pressing ENTER or cancel the action by pressing any other function key.

M606 **Paging forward is no longer possible**

Description: The end of the list has been reached.

Action: No other action is required.

M607 **Paging backward is no longer possible**

Description: The top of the list has been reached.

Action: No other action is required.

M702 **The user name entered is incorrect**

Description: An attempt has been made to create a new entry for a user. The new name entered for the user is incorrect.

Action: Repeat the action using a valid user name.

M703 **The password entered is incorrect**

Description: The password entered is incorrect.

Action: Repeat the action using a valid password.

M705 **No message module available for the language code**

Description: For the language code entered, no message module can be found.

Action: Change the entry for the language code and repeat the last action.

M710 **Incorrect entry**

Description: The entry made is incorrect.

Action: Correct the entry and repeat the function.

M713 **Confirmation of the password is missing**

Description: The password must be repeated in the field 'Confirmation'.

Action: Enter the password in both required fields and repeat the function.

M714 **Password and Confirmation are not identical**

Description: The password and its confirmation are not identical.

Action: Enter the same password in both fields and repeat the function.

M785 **The entry is incorrect, only 'X' is valid**

Description: A field to set a flag has an entry other than 'X'. 'X' is the only valid entry for a flag.

Action: Correct the input and repeat the function.

M862 **The entry has blank characters**

Description: The data entered has blank characters.

Action: Remove the blanks and repeat the function.

M870 **Slot length is already defined**

Description: When defining slot lengths of the PrintEx working storage, a value (rounded up to a multiple of 8) is specified more than once.

Action: Correct the entry.

M871 **Slot lengths are not in ascending sequence**

Description: When defining slot lengths of the PrintEx working storage, a value exists, which is less than the value of at least one slot with a lower slot number in the slot pool.

Action: Correct the entry.

M872 **Slot length 0 is not valid**

Description: In the definition of slot lengths for the PrintEx working storage, the value 0 has been entered.

Action: Correct the entry.

M873 **Percentage total exceeds 100**

Description: The percentages of the individual subpools of the PrintEx working storage sum up to a total of more than 100.

Action: Correct the entries for percentages to reach the total of 100.

M874 **Value entered is too large: the maximum value = 101376**

Description: In the definition of the working storage size, an entry was made for the size in kilobyte, which exceeds the maximum value 101376K (99M).

Action: Correct the entry.

M875 **Value entered is too large: the maximum value = 65528**

Description: In the definition of the working storage size, an entry was made for the size of a slot, which exceeds the maximum value 65528.

Action: Correct the entry.

M876 **The total of percentages is not 100**

Description: The percentages entered for individual subpools of the PrintEx working storage sum up to a total of less than 100.

Action: Corrent the percentages to reach the total of 100.

M878 **Storage definitions are saved**

Description: The current settings for the internal PrintEx storage control has been saved in the system file XPSVFIL. The current settings will be effective and used to initialize the storage management the next time PrintEx is started.

Action: No action is required.

NODC **Wrong entry for the decimal sign**

Description: The decimal sign is missing in a field that expects a decimal number.

Action: Enter the decimal sign and repeat the action.

NOHX **Wrong entry for hexadecimal characters**

Description: An entry, which is not a valid hexadecimal character, has been made in a field that expects hexadecimal characters.

Action: Enter valid hexadecimal characters and repeat the action.

VREA **Error when reading the file**

Description: When reading the file, an error occurred.

Action: Open the file.

VREU **Error when reading for update**

Description: When reading the file, an error occurred.

Action: Open the file.

VRWR **Error when writing back to file**

Description: When writing to the file, an error occurred.

Action: Open the file.

VUPD **Error on Update**

Description: When updating the file, an error occurred.

Action: Open the file.

V001 **PARAMETER INFORMATION '####' INVALID**

Description: The entry for the PrintEx startup parameter is invalid.

Action: Correct the parameter and repeat the PrintEx startup.

V002 **OPTION '####' FOR PARAMETER '####' UNKNOWN**

Description: An entry for a PrintEx startup option is not valid.

Action: Correct the parameter and repeat the PrintEx startup.

V003 **PARAMETER '####' UNKNOWN**

Description: The PrintEx startup parameter entered is not known.

Action: Correct the parameter and repeat the PrintEx startup.

V004 **XPSDaemon OPEN ERROR: '########' RC=####**

Description: The XPSDaemon application cannot be opened.

Action: Activate the XPSDaemon application (V NET,ACT,ID=XPSDaemon).

V006 **XPSDaemon START ERROR: R15=## FB=######**

Description: The XPSDaemon server cannot be started.

Action: Internal failure. Please notify your XPS sales representative.

V007 **XPSDaemon RC00 RPL ERROR: FB=###### SNS=#########**

Description: An error occurred when performing a VTAM command.

Action: Internal failure. Please notify your XPS sales representative.

V008 **XPSDaemon GENCB ERROR: R15=## R0=##**

Description: An error occurred when creating a control block.

Action: Internal failure. Please notify your XPS sales representative.

V009 **GETMAIN ERROR: R15=## RTE=#########**

Description: An error occurred when requesting dynamic storage.

Action: Increase the size of the PrintEx region.

V010 **FREEMAIN ERROR: R15=##**

Description: An error occurred when releasing dynamic storage.

Action: Internal failure. Please notify your XPS sales representative.

V011 **XPSDaemon VSAM ERROR RC=###### FILE=#########**

Description: An error occurred when performing a VSAM command.

Action: Internal failure. Please notify your XPS sales representative.

V029 **XPSDaemon STORAGE PARAMETER = 0**

Description: The PrintEx storage control program has been called without parameter list.

Action: Internal failure. Please notify your XPS sales representative.

XPSDaemon DUMPFILE FULL ==> DUMP TERMINATED

Description: When writing the PrintEx dump, the end of the dump file has been reached.

Action: Close the PrintEx dump file and, if the existing dumps need to be saved, print the data. Then reopen the dump file again. If the terminated dump will be needed, try to repeat the dump.

V057 **XPSDaemon NOT APF-AUTHORIZED**

Description: XPSDaemon needs APF authorization. This requires all load libraries used by XPSDaemon to be APF authorized.

Action: APF-authorize all used load libs and restart XPSDaemon.

V060 **XPSDaemon KCPENQ: RESOURCE ALREADY LOCKED**

Description: An attempt has beed made to lock a resource which was already locked.

Action: Internal failure. Please notify your XPS sales representative.

V061 **XPSDaemon KCPDEQ: TASK IS NOT THE OWNER OF THE RESOURCE**

Description: A task attempted to release a resource which it has not been previously locked.

Action: Internal failure. Please notify your XPS sales representative.

V062 **XPSDaemon KCPDEQ: RESOURCE NOT LOCKED**

Description: An attempt is made to release a resource which is not locked.

Action: Internal failure. Please notify your XPS sales representative.

V092 **XPSDaemon release expires in ## days**

Description: The expiration date of XPSDaemon will be reached in the specified number of days. The system will not be able to start from this date on.

Action: Ask your XPS sales representative for a new XPSDaemon license file.

V093 **XPSDaemon release is expired**

Description: XPSDaemon cannot be started because the expiration date has been reached.

Action: Ask your XPS sales representative for a new XPSDaemon license file.

V094 **XPSDaemon expiry information is not correct**

Description: The expitation date entered in the installation is invalid. The system cannot be started.

Action: Check the expiration information. If necessary, ask your XPS sales representative for a new XPSDaemon license file.

X001 **NO SUBTASK AVAILABLE**

Description: An error occurred when trying to create a new subtask.

Action: Internal failure. Please notify your XPS sales representative.

X015 **THERE IS NO DATA FOR THE USER INSTANCE**

Description: The data transferred to the XPSDaemon client is not valid.

Action: The connection is terminated.

X016 **TCPIP IS STOPPED**

Description: The TCP/IP system on the host is stopped.

Action: Restart XPSDaemon after TCP/IP has been made available.

X020 **TCPIP Error: R15=## RTE=########**

Description: An error occurred in a TCP/IP call.

Action: Internal failure. Please notify your XPS sales representative.

X023 **STORAGE ERROR: R15=## RTE=########**

Description: An error occurred when requesting dynamic storage.

Action: Internal failure. Please notify your XPS sales representative.

X030 **START APPLICATION ######## NOT AVAILABLE**

Description: The specified start application is not available at the time of the request.

Action: The connection is terminated and the VTAM error message is written to the XPSDaemon log.

X045 **INVALID EVENT: ########## IP=################**

Description: An unexpected event occurred.

Action: Internal failure. Please notify your XPS sales representative.

X046 **A CONNECTION CANNOT BE ESTABLISHED SERVICE=########**

Description: The attempt has been made to connect to the specified network printer. The connection defined for the destination is, however, not available at this time. Possible causes may be that the printer is switched off or another application is currently using this printer.

Action: PrintEx attempts to connect to this printer after waiting for the specified recovery time.

X053 **NUMBER OF VALID PRINTERS EXCEEDED**

Description: The number of valid printers exceeds the maximum allowed.

Action: Ask your XPS sales representative for a new license.

X056 **LICENSE NOT VALID**

Description: An attempt was made to start XPSDaemon with a non-valid or expired license.

Action: Ask your XPS sales representative for a new license.

Y001 **The printer ######## has no model ########**

Description: An attempt was made to convert a print job. The model defined for the destination, however, does not exist.

Action: Define the model.

Y002 **For the printer ########, the code page ######## is missing**

Description: An attempt was made to convert a print job. The code page defined for the model, however, does not exist.

Action: Define the code page.

Y003 **For the printer ########, the prefix data ######## is missing**

Description: An attempt was made to convert a print job. The prefix data defined for the model, however, does not exist

Action: Define the prefix data.

Y004 **For the printer ########, the suffix data ######## is missing**

Description: An attempt was made to convert a print job. The suffix data defined for the model, however, does not exist.

Action: Define the suffix data

Y006 **A JES printer with the same criteria already exists**

Description: An attempt is made to define a JES printer. There is, however, another definition with the same critieria used for the printer selection.

Action: Define different criteria.

Y010 **SMTP RETURN CODE ### NOT SUPPORTED.**

Description: An attempt has been made to send print data via SMTP as e-mail. The SMTP Server, however, detected an error.

Action: Internal failure. Please notify your XPS sales representative.

Y011 **SMTP: UNKNOWN AUTH PARAMETER.**

Description: PrintEx attempted to log on to the SMTP Server, using an AUTH parameter which is not supported.

Action: Internal failure. Please notify your XPS sales representative.

Y012 **SMTP: PASSWORD MISSING.**

Description: When PrintEx attempted to log on to the SMTP server, the server required a password. In PrintEx, however, this password is not defined in the e-mail destination.

Action: Define the password in the e-mail destination.

Y013 **Destination ######## does not exist.**

Description: An attempt has been made to convert a print job. The destination defined for the printer, however, does not exist.

Action: Define the destination.

Y014 **Separator page ######## does not exist.**

Description: At attempt has been made to convert a print job. The separator page defined for the printer, however, does not exist.

Action: Create the separator page in XPSDAEM.V600.DATA.

Y024 **The printer ######## has no destination defined.**

Description: After converting the print job, the destination no longer exists.

Action: Define the destination.

Y025 **Error when creating the JES printer ########.**

Description: When creating the definition of the JES printer, an error occurred.

Action: Internal failure. Please notify your XPS sales representative.

Y026 **Spool file error - RC########.**

Description: An error occurred when processing a spool file.

Action: Internal failure. Please notify your XPS sales representative.

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