

# PRINT - Print File Assignments

This Natural profile parameter is for mainframes only.

This Natural profile parameter allows you to define the print files to be used during the session. Within a session, up to 31 logical print files (numbered 1 to 31) and the hardcopy print file (number 0) can be used.

PRINT corresponds to the NTPRINT macro in the parameter module and can be used to specify dynamically the same keyword subparameters which you can specify statically with the NTPRINT macro. To provide different print file definitions, PRINT or NTPRINT can be specified multiple times.

<b>Possible settings</b>	See Keyword Subparameters below.	
<b>Default setting</b>	See below.	
<b>Dynamic specification</b>	YES	The parameter PRINT can only be specified dynamically. In NATPARM, the macro NTPRINT must be used.
<b>Specification within session</b>	NO	

The software components for accessing print files in different environments are called access methods. For the duration of a Natural session, each logical print file can be assigned to one access method only. The access method for a print file is determined by the keyword subparameter AM (see below).

Under OS/390 TSO and in batch mode, print files need not be predefined in the JCL. Provided they are defined by subparameter AM=STD, they can be allocated dynamically during the session by a Natural program using the DEFINE statement or user exit USR2021 in library SYSEXT.

This document covers the following topics:

- PRINT Parameter Syntax
- NTPRINT Macro Syntax
- Keyword Subparameters for All Environments
- Keyword Subparameters for AM=STD in All Environments
- Keyword Subparameters for AM=STD in OS/390 Environments
- Keyword Subparameters for AM=STD in VSE/ESA Environments
- Keyword Subparameters for AM=STD in BS2000/OSD Environments
- Keyword Subparameters for AM=CICS
- Keyword Subparameters for AM=COMP (Com-plete)
- Keyword Subparameters for AM=IMS
- Keyword Subparameters for DEFINE PRINTER Statement

## PRINT Parameter Syntax

With the PRINT parameter, you first specify one or more logical print file numbers, and then several keyword subparameters, which define the characteristics for these print files:

```
PRINT=((print-file-numbers),keyword-subparameters,...)
```

### ***print-file-numbers***

The file numbers must be specified first and enclosed in parentheses. The numbers can be from 1 to 31. They can be specified in any sequence. Multiple numbers must be separated from one another by commas or blanks. To specify a range of numbers, you can use a hyphen (-).

### ***keyword-subparameters***

The various types of keyword parameters are described below.

For print files with different characteristics, you specify different PRINT parameters. If any previous definition (or default) for the same print file exists, only the values for the specified keyword subparameters are overwritten, all other values remain unchanged.

#### **Examples:**

```
PRINT=( ( 2, 12, 18 ), AM=STD, DEST='PRINT**', OPEN=INITOBJ, CLOSE=CMD ), PRINT=( ( 1, 3, 6-11, 15 ), AM=NAF )
PRINT=( ( 0 ), AM=STD, DEST=HARDCOPX)
```

## **NTPRINT Macro Syntax**

With an NTPRINT macro, you first specify one or more logical print file numbers, and then several keyword subparameters which define the characteristics that are to apply to these print files:

NTPRINT (*print-file-numbers*),*keyword-subparameters*,...

### ***print-file-numbers***

The file numbers must be specified first and enclosed in parentheses. The numbers can be from 0 to 31. They can be specified in any sequence. Multiple numbers must be separated from one another by commas. To specify a range of numbers, you can use a hyphen (-).

### ***keyword-subparameters***

The various types of keyword subparameters are described below.

For print files with different characteristics, you specify different NTPRINT macros.

#### **Examples:**

```
NTPRINT ( 2, 12, 18 ), AM=STD, DEST='PRINT**', OPEN=INITOBJ, CLOSE=CMD
NTPRINT ( 1, 3, 6-11, 15 ), AM=NAF
```

```
NTPRINT ( 0 ), AM=STD, DEST=HARDCOPX
```

## **Keyword Subparameters for All Environments**

The following keyword subparameters are available: AM | DEST | OPEN | CLOSE | ROUTE

## AM - Type of Access Method

AM=xxx specifies the type of access method to be used.

For an online session, all print files to be used have to be assigned to a specific access method.

For a batch session, any print files not assigned to a specific access method will be automatically detected and assigned by the standard batch access method (AM=STD), provided that they have been predefined in the JCL. See also FAMSTD - Overwriting of Print and Work File Access Method Assignments.

<b>STD</b>	Standard sequential batch files (batch, TSO, TIAM, VM/CMS OS simulation).
<b>CMS</b>	CMS disk and SFS files.
<b>COMP</b>	Com-plete print files.
<b>CICS</b>	CICS transient data or temporary storage.
<b>NAF</b>	Natural Advanced Facilities.
<b>IMS</b>	IMS/TM destinations.
<b>PC</b>	Entire Connection.
<b>USER</b>	Third-party vendor print interface.
<b>SMARTS</b>	SMARTS print file.
<b>ESS</b>	Entire System Server.
<b>OFF</b>	Unassigned. No automatic assignments if FAMSTD=OFF is set.
<b>0</b>	Unassigned. Automatic assignments if FAMSTD=OFF is set. This is the default value.

**Note:**

PRINT=OFF is equivalent to: PRINT=((1-31)), AM=OFF).

It does not affect any of the other keyword subparameter specifications.

PRINT= ( ( 0 ) , AM=xxx) or NTPRINT ( 0 ) , AM=xxx determines the hardcopy print access method and is equivalent to profile parameter HCAM=xxx.

## DEST - External Dataset Name

DEST=name specifies the print destination (1 - 8 characters).

This corresponds to the OUTPUT value of the DEFINE PRINTER statement (and can be overwritten by a DEFINE PRINTER OUTPUT specification).

The meaning of this keyword subparameter depends on the access method.

<b>AM=STD</b>	<p>DEST is the logical dataset name (DDNAME, LINK name, DTF name).</p> <p>If the destination is to be for multiple files, two asterisks (**) have to be specified for the file number. These will be replaced by the corresponding logical file number for each print file. A DEST value including two asterisks must be enclosed in apostrophes when it is used as a dynamic parameter.</p> <p>The default value is DEST='CMPRT**' for IBM and DEST='P**' for SIEMENS environments.</p>
<b>Under CICS</b>	There is no default value for print files under CICS. Here, the DEST subparameter is mandatory, that is, CICS print files defined without a valid DEST specification are ignored.
<b>Under CMS</b>	For usage of DEST under CMS, refer to Natural under VM/CMS (in the Natural Operations for Mainframes documentation).
<b>Under VSE/ESA</b>	Only 7-character names are supported.
<b>Under IMS/TM</b>	Specifies the IMS/TM destination.

**Note:**

PRINT=( ( 0 ) , DEST=xxx) or NTPRINT ( 0 ) , DEST=xxx determines the hardcopy print destination and is equivalent to the Natural profile parameter HCDEST=xxx.

## OPEN - Time of File Opening

OPEN=xxx determines when the file is to be opened:

Value	The file is opened
<b>INIT</b>	for output at session initialization.
<b>OBF</b>	according to the default OPEN value for the different environments (Batch, CICS, Com-plete, TSO).
<b>OBJ</b>	when the execution of the first object which accesses the file starts. This is the general default, besides for AM=COMP and AM=IMS.
<b>OBJ1</b>	when the execution of the first object on level 1 which accesses the file starts. Otherwise, it is opened when it is first accessed.
<b>ACC</b>	when it is first accessed by a statement. This is the default for AM=COMP and AM=IMS.
<b>INITOBF</b>	for output at session initialization. Any subsequent re-opening of the file sets the default OPEN value for the different environments (Batch, CICS, Com-plete, TSO).
<b>INITOBJ</b>	for output at session initialization. Any subsequent re-opening of the file will be performed when the execution of the first object which accesses the file starts.
<b>INITOBJ1</b>	when the execution of the first object on level 1 which accesses the file starts. Otherwise, it is opened when it is first accessed.
<b>INITACC</b>	for output at session initialization. Any subsequent re-opening of the file will be performed when it is first accessed by a statement.

## CLOSE - Time of File Closure

CLOSE=xxx determines when the file is to be closed:

Value	The file is closed
<b>OBJ</b>	either when processing of the object in which it was first accessed is finished or when command mode, NEXT mode or MAINMENU is reached.
<b>CMD</b>	when command mode, NEXT mode or MAINMENU is reached. This is the default for AM=NAF, AM=COMP and AM=IMS.
<b>FIN</b>	at session end (this is the default for AM=STD). With CLOSE=FIN, a DEFINE PRINTER PRINTER statement causes an error if the printer was opened already. A CLOSE PRINTER statement for the printer is ignored.
<b>CLOSE=USER</b>	This value specifies that a print file is closed only if the file is open and one of the following conditions is true: <ul style="list-style-type: none"> <li>● a CLOSE PRINTER statement is issued,</li> <li>● a DEFINE PRINTER statement is issued,</li> <li>● at session termination.</li> </ul>

## ROUTE - Logical Print File Routing

Route=xxx determines whether logical print file routing is done according to the OUTPUT clause of the DEFINE PRINTER statement.

<b>ON</b>	Print file routing is done. This is the default value.
<b>OFF</b>	No print file routing is done.

Print file routing means that, if the name defined in the OUTPUT clause of a DEFINE PRINTER statement denotes a print file destination which is defined by a different logical printer, all print output is routed to this print file.

## NTPRINT Keyword Subparameters for AM=STD in All Environments

The following keyword subparameters are available: RECFM | BLKSIZE | LRECL | TRUNC | PAD | PADCHRO | ASA

### RECFM - Default Record Format of Dataset

RECFM=xxxx determines the default record format of the dataset.

The following formats are supported:

<b>F</b>	Fixed
<b>V</b>	Variable
<b>U</b>	Undefined
<b>B</b>	Blocked
<b>S</b>	Spanned
<b>A</b>	ASA
<b>M</b>	Machine control characters

The following values and also combinations of values are possible:

<b>Possible value:</b>	F, FA, FM, FB, FBA, FBM, V, VA, VM, VB, VBA, VBM, VBS, VBSA, VBSM, U, UA, UM.
<b>Default value:</b>	RECFM=VBA (variable blocked with ASA).

The RECFM specification only applies if no record format is predefined in the JCL or in the dataset DCB (OS/390 only).

## BLKSIZE - Default Block Size of Dataset

BLKSIZE=*nnnn* determines the default block size (in bytes) of the dataset.

<b>Possible values:</b>	0, or 8 to 32767.
<b>Default value:</b>	1016.

The BLKSIZE specification only applies if no block size is predefined in the JCL or in the dataset DCB (OS/390 only).

## LRECL - Default Record Length of Dataset

LRECL=*nnn* determines the default record length (in bytes) of the dataset.

<b>Possible values:</b>	0, or 5 - 254.
<b>Default value:</b>	0

This subparameter is used particularly to check for truncation and padding.

- For RECFM=V (B) the LRECL value includes a 4-byte record descriptor word.
- If LRECL = 0 is defined, the following applies:
- With RECFM = V (B), LRECL defaults to the minimum of BLKSIZE-4 and 254.
- With RECFM = U, LRECL defaults to BLKSIZE.
- With RECFM = F (B), the maximum record length in the Natural program being executed is taken when the file is opened. If no record length from a program is available when the file is opened, for example with OPEN=INIT, a record length of 132 is taken (plus 1 for ASA or a machine control character and/or plus 4 for a record-descriptor word if the record format is variable).

The LRECL specification only applies if no record length is predefined in the JCL or in the dataset DCB (OS/390 only).

## TRUNC - Truncation of Output Records

TRUNC=*xxx* determines whether the output records are truncated:

<b>ON</b>	Output records that are longer than the record length (LRECL) of the dataset will be truncated. This is the default value.
<b>OFF</b>	Error NAT1512 will be issued if an output record is longer than the dataset record length.

## PAD - Padding of Output Records

PAD=*xxx* determines whether the output records are padded with blanks (applies only to datasets of fixed record length):

<b>ON</b>	Output records that are shorter than the record length (LRECL) of the dataset will be padded with blanks. This is the default value.
<b>OFF</b>	Error NAT1510 will be issued if an output record is shorter than the dataset record length.

## Keyword Subparameters for AM=STD in OS/390 Environments

The following keyword subparameters are available: REREAD | FREE | BUFNO | DISP | VMAX

### REREAD - Closing of Tape Datasets

REREAD=*xxx* sets the REREAD option for the closing of the tape file:

<b>ON</b>	The REREAD option is set for the CLOSE SVC. This causes the volume to be repositioned to reprocess the dataset (this is the default).
<b>OFF</b>	The REREAD option is not set for the CLOSE SVC.

### FREE - Dataset De-allocation at File Closure

FREE=*xxx* determines whether the dataset is de-allocated when the file is closed:

<b>ON</b>	The FREE option is set for the CLOSE SVC, which means that the dataset is de-allocated when it is closed (and not at step termination).
<b>OFF</b>	The FREE option is not set for the CLOSE SVC (this is the default).

### BUFNO - Default Number of OS/390 I/O Buffers of Dataset

BUFNO=*nnn* defines the default number of OS/390 I/O buffers of the dataset.

<b>Possible values</b>	0 - 255.
<b>Default value</b>	0. In this case, OS/390 allocates five I/O buffers per default.

The number of I/O buffers can improve the performance of print file access dramatically. Note that the storage for I/O buffers is allocated below the 16 MB line.

The BUFNO specification applies only if the BUFNO value is predefined in the JCL.

### DISP - Open Print File for Modification

DISP=*xxx* determines whether the print file is opened for modification.

This corresponds to the JCL DD statement subparameter DISP=MOD.

<b>MOD</b>	New records are added at the end of the file.
<b>NOMOD</b>	The print file is rewritten from the start. This is the default value.

### VMAX - Control LRECL for Variable Record Format

VMAX=xxx controls the LRECL setting for an output file with variable record format (RECFM=V).

<b>ON</b>	Providing a nonzero BLKSIZE value exists for the file, VMAX=ON sets LRECL=BLKSIZE-4 for variable record format, regardless of the LRECL setting in the DCB or the LRECL subparameter.
<b>NAT</b>	LRECL is set to the length +4 of the largest record in the application program if this value is less than LRECL in the DCB for the dataset.
<b>OFF</b>	LRECL from the DCB for the dataset is used. This is the default value.

## PRINT Keyword Subparameters for AM=STD in VSE/ESA Environments

The following keyword subparameters are available: SYSNR | LABEL | REWIND

### SYSNR - Logical VSE SYS Number

SYSNR=nn determines the logical VSE SYS number.

<b>Possible values:</b>	1 - 99.
<b>Default value:</b>	By default, the SYS number is print file number plus 40 for print files 1 - 31; for print file 0, that is the hardcopy printer, the default is SYSLST. <b>Example:</b> The VSE default SYS number for print file 11 is 11 + 40 => SYS051.

### LABEL - Tape Label Processing

LABEL=xxx determines the tape label processing:

<b>ON</b>	The tape is in standard label format (this is the default).
<b>OFF</b>	The tape is unlabeled with front tape mark.
<b>NOTM</b>	The tape is unlabeled without front tape mark.

### REWIND - Action at File Closure

REWIND=xxx determines the action to be taken when a tape file is closed:

<b>ON</b>	The tape is rewound when the file is closed (this is the default).
<b>OFF</b>	The tape is not rewound when the file is closed.
<b>UNLOAD</b>	The tape is unloaded when the file is closed.

## PRINT Keyword Subparameters for AM=STD in BS2000/OSD Environments

The following keyword subparameter is available: DISP

### DISP - File Open Mode

DISP=*xxx* determines the open mode of the file:

<b>EXT</b>	The open mode is set to EXTEND.
<b>NOEXT</b>	The open mode is set to the default value OUTPUT.

## PRINT Keyword Subparameters for AM=CICS

The following keyword subparameters are available: TYPE | DISP

### TYPE - Type of CICS Storage Medium

TYPE=*xxxx* specifies the type of CICS storage medium to be used:

<b>MAIN</b>	Temporary main storage.
<b>AUX</b>	Temporary auxiliary storage.
<b>TD</b>	Transient data.

The TYPE default value used depends on the DEST parameter setting. If the DEST subparameter value matches a valid CICS transient data queue, the TYPE keyword subparameter defaults to TD, otherwise MAIN will be taken as the default value.

### DISP - CICS Storage Queue Disposition

DISP=(*xxx,xxx*) specifies the CICS storage queue disposition.

Possible value pairs are:

<b>(NEW,KEEP)</b>	The storage queue is deleted when the file is opened (this is the default)
<b>(NEW,DELETE)</b>	The storage queue is deleted when the file is opened and when it is closed.
<b>(OLD,DELETE)</b>	The storage queue is deleted when the file is closed.
<b>(OLD,KEEP)</b>	The storage queue is not deleted.

**Note:**

The DISP specification does not apply to CICS extra-partition transient data queues.

## PRINT Keyword Subparameters for AM=COMP (Com-plete)

The following keyword subparameter is available: DRIVER

### **DRIVER - Name of Com-plete Print Driver**

DRIVER=*name* specifies the *name* of the Com-plete print driver to be used.

## **PRINT Keyword Subparameters for AM=IMS**

The following keyword subparameters are available: BLKSIZE | DRIVER

### **BLKSIZE - Size of the Print Buffer**

BLKSIZE=*nnnnn* specifies the size of the print buffer sent to the IMS/TM destination.

### **DRIVER - Name of Natural IMS Print Driver**

DRIVER=*name* specifies the *name* of the Natural IMS print driver to be used.

For possible values, see NIMPARM Macro Parameters and Support of the Natural WRITE (*n*) Statement in the section Natural under IMS/TM in the Natural TP Monitor Interfaces documentation.

## **PRINT Keyword Subparameters for DEFINE PRINTER Statement**

With the following keyword subparameters, you can set default values for the DEFINE PRINTER statement options of the same names (see the Natural Statements documentation). When a printer is closed, all DEFINE PRINTER statement options are reset to their default values.

The following keyword subparameters are available: PROFILE | NAME | FORMS | DISP | COPIES | CLASS | PRTY

### **PROFILE - Name of Printer Control Characters Table**

PROFILE=*name* specifies the *name* of printer control characters table (NTCCTAB macro).

### **NAME - Name of Listing**

NAME=*name* specifies the listing *name*.

### **FORMS - Name of Listing Forms**

FORMS=*name* specifies the listing forms *name*.

### **DISP - Listing Disposition**

DISP=*disposition* specifies the listing *disposition* (HOLD, KEEP, DELETE or LEAVE).

### **COPIES - Number of Copies**

COPIES=*nnn* specifies the number of copies to be printed (1 - 255).

## **CLASS - Spool Class**

CLASS=*class* specifies the spool class (1 byte).

## **PRTY - Listing Priority**

PRTY=*nnn* specifies the listing priority (1 - 255).