

# Natural under TSO

This document describes the functionality of the Natural TSO interface (product code NTI) and the operation and individual components of Natural under TSO in the operating system z/OS.

The following topics are covered:

- General Information about the Natural TSO Interface
- Natural TSO Interface Generation Parameters
- Datasets Used by Natural under TSO
- Issuing TSO Commands from Natural under TSO

See also:

- *Installing the Natural TSO Interface* in the *Natural Installation* documentation.
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## General Information about the Natural TSO Interface

The Natural TSO interface (NATTSO) consists of a number of service routines interfacing with the z/OS operating system.

NATTSO is supplied as a source module and can be customized to meet your requirements; see also *Installing the Natural TSO Interface* in the *Natural Installation* documentation. You can either assemble and link NATTSO to the Natural nucleus or you can run it separately by connecting it with a shared nucleus.

NATTSO is fully reentrant and can run above the 16 MB line. Multiple Natural sessions can be started in parallel within one TSO region, and you can toggle between the sessions by means of a SWAPKEY (see below).

## Natural TSO Interface Generation Parameters

The NATTSO macro contains several generation parameters to change Natural TSO interface's internal defaults.

These parameters are:

ABEXIT | ALTSCRN | LBPNAME | LE370 | NDBFSRV | SUBPOOL | SWAPKEY | TIOBSZ | TTYTYPE

### ABEXIT - Abend Processing Mode

This parameter specifies the mode of abend processing within Natural.

Possible values are:

<b>Value:</b>	<b>Explanation:</b>
ESTAE	Natural intercepts all abends and issues the appropriate error messages.  This is the default value.
SPIE	Only program checks (SOCx abends) are intercepted as they used to be with Natural Version 2.1.
NONE	Natural does not intercept any abends or program checks at all. This value corresponds to the Natural profile parameter DU=FORCE.  The setting ABEXIT=NONE is not recommended because some functions which require the abend interception will not work any longer. The usage of profile parameter MT will cause an abend U0322 instead of error NAT0953 when the CPU time limit is reached.

## ALTSCRN - Session Screen Mode

This parameter specifies whether the 3270 alternate screen size is to be used. There are 2 sets of screen heights/widths from the VTAM LOGMODE definition for the terminal, default and alternate screen size. Usually, the default screen size is 24 lines and 80 columns. The alternate screen size depends on the 3270 terminal model (2, 3, 4 or 5).

Possible values are:

<b>Value:</b>	<b>Explanation:</b>
YES	The alternate screen size is to be used.  This is the default value.
NO	The default screen size is to be used.

With Natural profile parameter TMODEL, the screen size can be overwritten.

## LBPNAME - Sharing of Local Buffer Pools

This parameter controls the sharing of the local buffer pool when running multiple Natural sessions within the same TSO region. It defines the *name* of the shared buffer pool environment and is used to locate the shared local buffer pool.

Possible values are:

<b>Value:</b>	<b>Explanation:</b>
<i>name</i>	<i>name</i> can be 1-8 characters long.
LBPNAME=	The default value is none, that is, local buffer pools are not shared.

When running multiple Natural sessions in a z/OS batch or TSO environment concurrently, each session allocates storage for a separate local buffer pool. Except for the Natural z/OS batch server, the local buffer pools are not shared by default, that is, if the different sessions use the same Natural objects, these have to be loaded for each session separately. If *name* is specified, all Natural sessions will share the same local buffer pool.

## LE370 - Use of IBM Language Environment

This parameter specifies whether Natural is to run in the IBM Language Environment (LE).

Possible values are:

Value:	Explanation:
YES	You can call external subprograms according to the LE calling conventions.
NO	You can only call main programs of the language environment.  This is the default value. This means, that a new LE enclave is created and terminated for each CALL statement.
LE370=POSIX	You can call external subprograms according to the LE calling conventions with POSIX semantics, that is, the LE is initialized with runtime option <code>POSIX(ON)</code> .
LE370=AMODE24	Support of external subprograms linked in addressing mode 24. LE is initialized with options <code>ALL31=(OFF)</code> and <code>STACK=( , ,BELOW)</code> .
LE370=NOHDLR	No setting of an LE error handler is done by Natural during the call of LE subprograms. This means, if an unhandled error occurs during the execution of an LE subprogram, the LE enclave is terminated and so the Natural session is lost.

Multiple parameter values are enclosed in brackets, for example:

`LE370=(YES,POSIX,AMODE24)`

For more information about Natural running with the IBM Language Environment, refer to *LE Subprograms* in the *Natural Operations* documentation.

## NDBFSRV - Natural for DB2 File Server

This parameter specifies whether the Natural for DB2 file server is to be used.

Possible values are:

Value:	Explanation:
NO	The Natural for DB2 file server will not be used.  This is the default value.
YES	The Natural for DB2 file server is invoked at each terminal I/O.

## SUBPOOL - Storage Subpool for GETMAIN Requests

This parameter defines the storage subpool for GETMAIN requests.

Possible values are:

Value:	Explanation:
0 - 127	Specifies the z/OS subpool number for the GETMAIN request. Any valid z/OS task-related subpool number for a problem state program (0-127) can be used.
0	This is the default value.

## SWAPKEY - TSO/ISPF Split Screen Feature Support

This parameter defines the TSO/ISPF split screen swap key for Natural, which is assigned to PF9 on most of the panels of Software AG product Natural ISPF (Integrated Structured Programming Facility).

Possible values are:

Value:	Explanation:
PF $nn$  PA $nn$	Defines the PF- or PA-key which shall be used to swap to the next TSO/ISPF session. Valid keys are PF1 to PF24 and PA1 to PA3.  <b>Note:</b> The specified key cannot be used by Natural applications. Usually, the SWAP command in TSO/ISPF is assigned to the PF9 key on most TSO/ISPF panels. Split screen support requires the TSO/ISPF interface module ISPLINK from the ISPF load library to be included in the link step for NATTSO.
SWAPKEY=	By default, no swap key is defined, that is, no split screen feature support is generated.

## TIOBSZ – Size of the Terminal I/O Buffer

This parameter specifies the size of the terminal I/O buffer. It will be allocated below the 16 MB line.

TIOBSZ= $nnnn$	$nnnn$ is the size of the terminal I/O buffer in bytes. Possible values: 4096 – 16777216. The default value is 8192.
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See also generation parameters TIOBSZ1 and TIOBSZ2 in *Natural z/OS Generation Parameters* in the *Operations* documentation.

## TTYTYPE - Default Device Type for TTY Terminals

This parameter defines the default device type for teletype terminals (TTY or TWX).

Possible values are:

Value:	Explanation:
$name$	Defines the default device type for teletype terminals. The specified type must be defined in the NATCONFIG (Natural configuration) module.
TTY	This is the default value.

TTYTYPE can be overwritten by the profile parameter TTYPE or by the terminal command %T= during the session.

## Datasets Used by Natural under TSO

The following datasets are required if certain functions are used during a Natural TSO session:

CMEDIT	Software AG Editor Work File
CMHCOPY	Hardcopy Print Output
CMPLDG	Dynamic Profile Parameter Report Output
CMPRMIN	Dynamic Profile Parameter Input
CMPTnn	Additional Reports 01-31
CMTRACE	External Trace Output
NATRJE	Job Submit Output
STEPLIB	Load Library for External Modules
CMWKFnn	Work Files 01-32

These datasets are described below.

Unless otherwise stated below, the default DCB RECFM/LRECL information is as follows:

RECFM=FB and LRECL=80 for sequential input datasets

RECFM=FBA and LRECL=133 for sequential output datasets

### CMEDIT - Software AG Editor Work File

The Software AG editor work file VSAM dataset is required if a local or global Software AG editor buffer pool is to be used. If not defined in the JCL or by TSO command ALLOC, the name of the Editor work file specified by subparameter DSNAME of profile parameter EDBP or parameter macro NTEDBP is used by Natural to do the dynamic allocation for the Editor work file.

Alternatively, profile parameter EDPSIZE can be used to run with an auxiliary editor buffer pool, which does not require an editor work file. For more information about the installation of the Software AG editor, refer to *Installing the Software AG Editor* in the *Natural Installation* documentation.

### CMHCOPY - Hardcopy Print Output

The default name of the hardcopy print output dataset is CMHCOPY. It can be changed by one of the following:

- the DEST subparameter of profile parameter PRINT for Print File 0,
- the profile parameter HCDEST, which is an equivalent of PRINT= ( ( 0 ) , DEST= . . . ),

- the setting of the system variable \*HARDCOPY during the session,
- the terminal command %H during the session.

The subparameters of the PRINT profile parameter for Print File 0 can be used to change the default values for the hardcopy dataset. The default dataset name CMHCOPY implies CLOSE=FIN for the hardcopy print dataset, that is, after the dataset is opened for output, any subsequent change of the hardcopy print output dataset name is not honored. If a different name is defined at open time, the hardcopy dataset will be closed upon the next terminal I/O.

During the session, the hardcopy dataset can be released and reallocated (before open or after close) by the by dynamic allocation (see Natural Application Programming Interface USR2021N).

## **CMPLOG - Dynamic Profile Parameter Report Output**

If profile parameter PLOG=ON is set and dataset CMPLOG is available, the evaluated dynamic profile parameters are written to this dataset during session initialization. If dataset CMPLOG is not available, the evaluated dynamic profile parameters are written to the TSO terminal in line mode.

## **CMPRMIN - Dynamic Profile Parameter Input**

If available, this dataset is read during session initialization to get dynamic profile parameters. Only the first 72 positions of each record are used to build a dynamic profile parameter string.

Any other profile parameters which are passed directly for the start of the Natural nucleus, for example, by the TSO CALL command, are concatenated at the end of the parameter string which is build from the input of CMPRMIN, that is, these can be used to overwrite the parameters from CMPRMIN.

## **CMPR $T_{nn}$ - Additional Reports 01-31**

These datasets can be used by Natural print file statements like WRITE (*nn*). If no DCB information (for example, RECFM, LRECL, BLKSIZE) is available, the defaults are defined by the profile parameter PRINT or by the macro NTPRINT in the Natural parameter module. The print file dataset names can be overwritten by subparameter DEST.

## **CMTRACE - External Trace Output**

If profile parameter ETRACE=ON is set or the equivalent terminal command %TRE+ was issued, any Natural trace output during the session is written to the CMTRACE dataset. To define the Natural components that shall be traced, the profile parameter TRACE is required.

If dataset CMTRACE is not available, it will be allocated dynamically as

```
//CMTRACE DD SYSOUT=*
```

when the first trace record is to be written.

## **NATRJE - Job Submit Output**

This dataset is used for the Natural job submitting utility. If it is not defined, it will be allocated dynamically as

```
//NATRJE DD SYSOUT=(A,INTRDR)
```

when the first job is submitted.

## **STEPLIB - Load Library for External Modules**

STEPLIB is the default load library name for loading external modules, for example, the shared nucleus (profile parameter NUCNAME), a separate Adabas link routine module (profile parameter ADANAME), the session back-end program (profile parameter PROGRAM) and any external subprograms not linked to the Natural parameter module.

The load library name can be overwritten by profile parameter LIBNAM. The specified load library name must be defined in the TSO job control or by an ALLOC statement, for example, in the CLIST which starts the Natural session.

## **CMWKFnn - Work Files 01-32**

These datasets can be used by Natural work file statements like READ WORKnn and WRITE WORKnn. If no DCB information (RECFM, LRECL, BLKSIZE, etc.) is available in the JCL or in the VTOC entry for the dataset, the defaults are defined by the WORK profile parameter or by the NETWORK macro in the Natural parameter module. The work file dataset names can be overwritten by subparameter DEST.

## **Issuing TSO Commands from Natural under TSO**

You can use the Natural example program TSO in library SYSEXTP to issue TSO commands; for example:

```
TSO LISTALC STATUS
```

If you enter TSO without parameters, a menu prompts you for a TSO command. To exit from the menu enter a period (.) in the first position, or press PF3.