

SYSOBJH Utility

The following topics are covered below:

- General Information
 - Invoking SYSOBJH
 - Object Handler Objects
 - Object Handler Commands
 - Syntax of Object Handler Clauses
 - Batch or Direct Command Calls
-

General Information

The Object Handler is designed to process objects for distribution of applications. This is done by unloading the objects in the source environment to work files and loading them from work files in the target environment. The unloading and loading can be done in internal format (in the same way as the utility SYSPAUL) or in TRANSFER format (in the same way as the utility SYSTRANS).

Work files created with the utilities SYSPAUL and SYSTRANS can also be processed.

Work files created with the Object Handler in internal format can be processed by the utility SYSPAUL in Natural 5.1.1.1, but only those objects which SYSPAUL is able to process (Natural programming object, Resources, DDMs and Error Messages). Other objects such as Natural related objects, Natural Command processors, External objects and FDTs are ignored by SYSPAUL.

Work files created with the Object Handler in TRANSFER format can be processed by the utility SYSTRANS on all platforms.

Invoking SYSOBJH

To invoke SYSOBJH for interactive usage by entering NATURAL direct commands, do one of the following:

- enter the command SYSOBJH

The SYSOBJH welcome screen is displayed and offers the following functions:

- Load
- Unload
- Administration

You can select the desired function either by clicking the corresponding push button or by selecting the corresponding function under the 'Go' menu item.

If you do not want to use wizards for the load / unload select the 'Advanced user' check box, or select the 'Advanced user' submenu under the 'Options' menu item.

Load

You use the load function to load data from work file(s) into the Natural system environment. If the 'Advanced user' setting is 'OFF', SYSOBJH offers a load wizard, see Load Wizard. Otherwise you will get a dialog displaying the Natural environment, where you can activate the load, find and scan commands, see Advanced Users Load.

Load Wizard

If you did not select the 'Advanced User' option, SYSOBJH offers a wizard for the load sequence. The wizard dialogs offer the 'Next' button to continue, and the 'Back' button to go back one step. If you click the 'Cancel' button on the wizard dialog, you cancel the load sequence.

Step 1

The following items can be selected:

- Load Objects from Natural Work Files
- Start an Object Handler Command Procedure
- Load a SYSPAUL Application

Load Objects from Natural Work Files

Step 2

Determine the options that should be used for the load sequence. Decide whether you want to use an option workplan Types of Object Handler Workplans, or whether you want to use the global options.

If you decide to use an option workplan, enter the name of the option workplan. You can list it by clicking the 'List' button.

If you decide to use the global options, then name the transfer option and the load file. Click the 'Set' button to enter more options for the load sequence.

- Transfer:
Select this check box if you want to load transfer files, that means files that resulted from a SYSTRANS unload function, or from a SYSOBJH unload function if transfer was set to 'ON'.
- Load file:
Enter the name of the Natural work file containing the objects for the load.
Click the 'Set' button to enter the report and the restart setting, the replace option, FSEC and FDIC setting, and the XREF or transfer options. See Option-Settings for a description of the keywords and the valid values for the single items.

Step 3

If you want to use parameters for the load select the corresponding setting.

If you want to use a parameter workplan, enter the name of the workplan. You can list it by clicking the 'List' button.

If you want to use the global parameters click the 'Set' button, and enter the parameters according to your requirements. See Parameter-Settings for a description of the keywords and the valid values for the single items.

Step 4

If you want to load all objects from the work file, select the corresponding radio button.

If you want to specify objects, select the object type and enter the object selection on the following dialog. To give a more detailed specification, press the Details button.

- For a selection of Natural objects, see Natural-Objects-Selection for a description of the keywords and the valid values for the single items.
- For a selection of Natural error messages, see Natural-System-Errors-Selection for a description of the keywords and the valid values for the single items.
- For a selection of Natural command processor sources, see Natural-Command-Processors-Selection for a description of the keywords and the valid values for the single items.
- For a selection of Natural related objects, see Natural-related-objects-selection for a description of the keywords and the valid values for the single items.
- For a selection of External files, see External-Objects-Selection for a description of the keywords and the valid values for the single items.
- For a selection of FDTs, see FDT-Selection for a description of the keywords and the valid values for the single items.

If you want to select a work plan to use, enter the name of this work plan in the next dialog. You can list it by clicking the 'List' button.

Step 5

The wizard displays the load command. Confirm the setting with 'Next' to start transferring files. If you selected the wrong command, click 'Back' to modify the corresponding setting.

Step 6

The object handler performs the load command and displays the result.

Step 7

The object handler asks whether you want to continue the load. If you answer with 'Yes', you can choose where you want to continue the load. If you answer with 'No', the welcome screen will be displayed from where you can start another function or leave the object handler.

Start an Object Handler Command Procedure

Step 2

Enter the name of the object handler procedure that should be started for transferring files, see Types of Object Handler Workplans To see the content of the workplan, click 'List'.

Step 3

The content of the procedure workplan is displayed. Click 'Next' to execute the procedure, click 'Back' to choose another procedure.

Step 4

The object handler executes the procedure and displays the result.

Step 5

The object handler asks whether you want to continue the load. If you answer with 'Yes', you can continue the load from Step 1. If you answer with 'No', the welcome screen will be displayed from where you can start another function or leave the object handler.

Load a SYSPAUL Application

Step 2

Select the location and the name of the 'applinfo.txt' of the application. It is located in the first directory of the SYSPAUL application.

Step 3

The name of the application is displayed. Click 'Next' to load the application files and to copy the non-Natural files to their destination, click 'Back' to choose another application.

Step 4

The object handler loads the application and displays the result. You will find the report file 'sysload.log' in the temporary directory of Natural.

Step 5

The object handler asks if you want to continue the load. If you answer with 'Yes', you can continue the load from Step 1. If you answer with 'No', the welcome screen will be displayed from where you can start another function or leave the object handler.

Advanced Users Load

If you start the Load function of the object handler with the 'Advanced user' checkbox active, you can process the advanced users load sequence.

- At first you are asked for the option and parameter settings of the load.
- If you decided to use the global options, select the transfer option and the load file. Click the 'Set' button to enter more options. If you want to use an option workplan, enter the name. You cannot perform a load or scan function without options. At least the load file must be selected. See Option-Setting for a description of the keywords and the valid values for the single items.
- If you want to use parameters for the load function, you can use either a workplan or the global parameters. If you want to use the global parameters, click the 'Set' button, and enter the parameters according to your requirements. See Parameter-Settings for a description of the keywords and the valid values for the single items.

Now a table view is displayed that shows your Natural environment. To navigate in the table use the menu item 'Go' - submenu 'Back', or submenu 'Next'.

To change the option or parameter settings during the load session, use the menu item 'Options' - submenu 'Settings'.

To load objects from the Natural work file (load file) into the Natural environment use the menu item 'Go' - submenu 'Load'.

To find objects in the Natural environment use the menu item 'Go' - submenu 'Find'.

To scan the Natural work file (load file) for specified objects, or to list all objects contained in the load file use the menu item 'Go' - submenu 'Scan Work File for'.

To call the administration function of the object handler use the menu item 'Go' - submenu 'Administrate'.

The Natural load files do not contain delete instructions. You can delete objects from your Natural environment by selecting the objects in the table, and clicking menu item 'Object' - submenu 'Delete'.

To create a new workplan use the menu item 'Object' - submenu 'New'.

To open an existing workplan use the menu item 'Object' - submenu 'Open'.

To leave the load select menu item 'Object' - submenu 'Close', or close the window of the load.

Note:

If the setting of the work plan library is not valid, use the Tools/Change Workplan Library menu item to change it.

Unload

You use the unload function to unload data from the Natural system environment into Natural work file(s). If the 'Advanced user' setting is 'OFF', SYSOBJH offers an unload wizard, see Unload Wizard. Otherwise you will get a dialog displaying the Natural environment, where you can activate the unload, find and scan commands, see Advanced Users Unload.

Unload Wizard

If you did not select the 'Advanced user' option, SYSOBJH offers a wizard for the unload sequence. The wizard dialogs offer the 'Next' button to continue, and the 'Back' button to go back one step. If you click the 'Cancel' button on the wizard dialogs, you cancel the unload sequence.

Step 1

The following items can be selected:

- Unload Objects into Natural Work Files
- Start an Object Handler Command Procedure

Unload Objects into Natural Work Files

Step 2

Determine the options that should be used for the unload sequence.

Decide whether you want to use an option workplan Types of Object Handler Workplans, or whether you want to use the global options.

If you decide to use an option workplan, enter the name of the option workplan. You can list it by clicking the 'List' button.

If you decide to use the global options, then name the transfer option and the unload file. Click the 'Set' button to enter more options for the unload sequence.

- Transfer:
Work file results from a transfer unload can be loaded on each platform. They contain Natural sources and Natural error messages only.
- Unload file:
Enter the name of the target Natural work file.
Click the 'Set' button to enter the report, FSEC and FDIC setting, and the XREF or transfer options. See Option-Settings for a description of the keywords and the valid values for the single items.

Step 3

If you want to use parameters for the unload, select the corresponding setting.

If you want to use a parameter workplan, enter the name of the workplan. You can list it by clicking the 'List' button.

If you want to use the global parameters, click the 'Set' button, and enter the parameters according to your requirements. See Parameter-Settings for a description of the keywords and the valid values for the single items.

Step 4

Specify the objects according to your selection in the previous step.

To give a more detailed specification, press the Details button.

- For a selection of Natural objects, see [Natural-Objects-Selection](#) for a description of the keywords and the valid values for the single items.
- For a selection of Natural error messages, see [Natural-System-Errors-Selection](#) for a description of the keywords and the valid values for the single items.
- For a selection of Natural command processor sources, see [Natural-Command-Processors-Selection](#) for a description of the keywords and the valid values for the single items.
- For a selection of Natural related objects, see [Natural-related-objects-selection](#) for a description of the keywords and the valid values for the single items.
- For a selection of External files, see [External-Objects-Selection](#) for a description of the keywords and the valid values for the single items.
- For a selection of FDTs, see [FDT-Selection](#) for a description of the keywords and the valid values for the single items.

If you want to select a work plan to use, enter the name of this work plan in the next dialog. You can list it by clicking the 'List' button.

Step 5

The wizard displays the unload command. Confirm the setting with 'Next' to start transferring files. If you selected the wrong command, click 'Back' to modify the corresponding setting.

Step 6

The object handler performs the unload command and displays the result.

Step 7

The object handler asks whether you want to continue the unload. If you answer with 'Yes', you can choose where you want to continue the unload. If you answer with 'No', the welcome screen will be displayed from where you can start another function or leave the object handler.

Advanced Users Unload

If you start the Unload function of the object handler with the 'Advanced user' checkbox active, you can process the advanced users unload sequence.

- At first you are asked for the option and parameter settings of the unload
- If you decided to use the global options, select the transfer option and the unload file. Click the 'Set' button to enter more options. If you want to use an option workplan, enter the name. You cannot perform a unload or scan function without options. At least the unload file must be selected. See Option-Setting for a description of the keywords and the valid values for the single items.
- If you want to use parameters for the unload function, you can use either a workplan or the global parameters. If you want to use the global parameters, click the 'Set' button, and enter the parameters according to your requirements. See Parameter-Settings for a description of the keywords and the valid values for the single items.

Now a table view is displayed that shows your Natural environment. To navigate in the table, use the menu item 'Go' - submenu 'Back', or submenu 'Next'.

To change the option or parameter settings during the unload session, use the menu item 'Options' - submenu 'Settings'.

To unload objects from the Natural environment into the unload file, use the menu item 'Go' - submenu 'Unload'.

To find objects in the Natural environment, use the menu item 'Go' - submenu 'Find'.

To scan the Natural work file (unload file) for specified objects, or to list all objects contained in the unload file, use the menu item 'Go' - submenu 'Scan Work File for'.

You cannot scan a work file until an unload is still active. To end the current unload, click menu item 'Go' - submenu 'End current unload'. The next unload will write into a new work file, so if you do not change the work file name, the existing file will be overwritten.

To call the administration function of the object handler, use the menu item 'Go' - submenu 'Administrate'.

You can delete objects from your Natural environment by selecting the objects in the table, and clicking menu item 'Object' - submenu 'Delete'.

To create a new workplan, use the menu item 'Object' - submenu 'New'.

To open an existing workplan, use the menu item 'Object' - submenu 'Open'.

To leave the unload, select menu item 'Object' - submenu 'Close', or close the window of the unload.

Note:

If the setting of the work plan library is not valid, use the Tools/Change Workplan Library menu item to change it.

Administration

You use the administration function to manage the objects of the object handler (workplans).

Workplans are simple Natural text objects, located in a library called workplan library. The default library for workplans is the library WORKPLAN located in the current Fuser system file. See Object Handler Objects for information about workplans.

The administration function of the object handler shows all existing workplans in the workplan library in a table view. If the workplan library does not contain any workplan, the table is empty.

To sort objects in the table, doubleclick the corresponding column, or use menu item 'Options' - submenu 'Sort table by'.

To change the workplan library, click menu item 'Tools' - submenu 'Change Workplan Library'.

To create a new workplan, use menu item 'Object' - submenu 'New'.

For option, parameter and selection workplans you will get dialogs with input fields, until the option 'Free Format Editing' is off. If the option 'Free Format Editing' is on, or you create a workplan of another type, you will get a dialog with an edit area. Enter the content of the workplan, for a procedure see the syntax in Object Handler Commands, for other types of workplans see the Syntax of Object Handler Clauses.

To open a workplan, use menu item 'Object' - submenu 'Open'.

You will get a dialog with an edit area. Modify the content of the workplan, for a procedure see the syntax in Object Handler Commands, for other types of workplans see the Syntax of Object Handler Clauses.

To import a workplan from the file system, use the menu item 'Object' - submenu 'Import'. To export workplan(s) to the file system, select them in the table, and use the menu-item 'Object' - submenu 'Export'.

To delete workplans from the workplan library, use the menu item 'Object' - submenu 'Delete'.

To check the syntax of workplan(s), select them in the table, and use the menu-item 'Object' - submenu 'Check'.

To execute procedure workplan(s), select them in the table, and use the menu-item 'Object' - submenu 'Execute'.

To exit the administration function, select menu item 'Object' - submenu 'Close', or close the window.

Object Handler Objects

With the Object Handler, objects can be loaded and unloaded 'on-the-fly'. One can also automate the load / unload function if the Object Handler procedures have been created and saved.

To achieve a flexible usage of these procedures, there are different kinds of object handler objects, called 'Workplans'. These Workplans are stored in a Natural library as Natural objects of type TEXT. If no library is specified when a workplan is referenced, the library 'WORKPLAN' on the Natural FUSER system file is used.

A workplan consists of a header and the corresponding information. In addition, comments and comment lines (identified by '/'*) can be inserted.

- Types of Object Handler Workplans
- Referencing Object Handler Workplans

Types of Object Handler Workplans

The type of a workplan is identified by a workplan header.

Procedure

Header: TYPE PROCEDURE

A "procedure" contains a sequence of fully specified commands separated by semicolons. The object handler can be started in batch mode to perform such a "procedure". A "procedure" may contain any kind of command (except EXECUTE) in any combination.

Selection

Header: TYPE SELECTION

A "selection" contains a selection criterion for objects. It can be used in object handler commands.

List

Header: TYPE LIST

A "list" contains a list of objects. It can be used in object handler commands.

Parameter

Header: TYPE PARAMETER

A "parameter" contains LOAD / UNLOAD parameters, for example, old and new name. It can be used in object handler commands.

Option

Header: TYPE OPTION

An "option" contains LOAD / UNLOAD options, for example, report settings. It can be used in object handler commands.

Referencing Object Handler Workplans

Whenever an Object Handler workplan is referenced, the following syntax is used:

```
( workplan-name
  [LIBRARY library-name] [DBID dbid [FNR fnr] ] [NAME vsam-name]
  [CIPHER cipher]
  [{PASSWORD/PSW} password]]
)
```

Description of the keywords and the valid values for the single items:

Keyword	Values	Default Value
workplan-name	valid Natural object name	No default
LIBRARY	valid Natural library name where the workplan is located	'WORKPLAN'
DBID	valid DBID	0 (Current FNAT/FUSER)
FNR	valid FNR	0 (Current FNAT/FUSER)
NAME	valid VSAM name (used on mainframes only)	' ' (Current FNAT/FUSER)
CIPHER	8-character cipher code (used on mainframes only)	' ' (Current FNAT/FUSER)
PASSWORD	8-character Adabas password (used on mainframes only)	' ' (Current FNAT/FUSER)

Object Handler Commands

Available Commands

The following object handler commands are available

DIRECT

The DIRECT clause may contain all possible NATLOAD, NATUNLD, SYSTRANS commands in the original format of these commands. If more than one direct command is given, they must be separated with a ';'.

EXECUTE - procedure-workplan

Executes a workplan of type 'PROCEDURE'.

UNLOAD select-clause [parameter-setting] [option-setting]

Unload the objects given in the select clause with the parameters given in the parameter setting with the options given in the option setting.

LOAD select-clause [parameter-setting] [option-setting]

Load the objects given in the select clause with the parameters given in the parameter setting with the options given in the option setting.

LOADALL [parameter-setting] [option-setting]

Load all objects from the work file with the parameters given in the parameter setting with the options given in the option setting.

SCAN select-clause [parameter-setting] [option-setting]

Scan the work file for the objects given in the select clause with the parameters given in the parameter setting with the options given in the option setting.

SCANALL [parameter-setting] [option-setting]

Scan the work file for all objects with the parameters given in the parameter setting with the options given in the option setting.

DELETE select-clause [option-setting]

Delete the objects given in the select clause with the options given in the option setting.

Restrictions:

Delete FDT is not possible.

FIND select-clause [option-setting]

Find the objects given in the select clause and write into Work File 3 or to the specified file name. In addition, a report of the found objects can be written into Work File 4 or the specified report file.

FINDLIB select-clause [option-setting]

Find the libraries for Natural objects or Command Processor sources given in the select clause and write into Work file 3 or to the specified file name. In addition, a report of the found objects can be written into Work file 4 or the specified report file.

RESTART [file-name]

Continues an interrupted load function. This is only possible when during the aborted load restart information had been written into a restart file (see parameter in option setting).

Syntax of Object Handler Clauses

- Select-Clause
- Parameter-Setting
- Option-Setting
- Object List

Notes:

- Partial underlining indicates an abbreviated form.
- Elements contained within braces { } indicate that one of the elements must be specified. The elements are separated by '/'
- Elements contained within square brackets [] are optional.
- Uppercase letters in boldface indicate keywords

Select-Clause

A select-clause consists of one of the following items:

```
{ Selection-workplan  
/ Natural-objects-selection  
/ Natural-related-objects-selection  
/ Natural-System-Errors-selection  
/ Natural-Command-processors-selection  
/ External-objects-selection  
/ FDT-selection  
}
```

Selection-workplan

A selection workplan is a workplan of type SELECTION. It contains a Natural object selection, a Natural related objects selection, a Natural System Errors selection, a Natural Command processors selection, an external objects selection, a FDT selection or an object list. An object list can be used for the FIND and UNLOAD command only.

Natural-objects-selection

Syntax:

```

object-name
LIBRARY library-name

[DBID dbid [FNR fnr] [NAME vsam-name] [CIPHER cipher] [{PASSWORD/PSW} password]]

[OBJTYPE resource-type]

[NATYPE object-type]

[SCKIND object-kind]

[MODE object-mode]

[FMNUM error-number-from] [TONUM error-number-to]

[SLKIND message-type]

[LANGUAGE languages]

[DDMDBID dbid] [DDMFNR fnr]

[NATVERS natural-version]

[{DATE date / [FMDATE date-from] [TODATE date-to]}]

[{SIZE size / [FMSIZE size-from] [TOSIZE size-to]}]

[USERID userid]

[TID terminalid]

[EXCEPT (
object-name

[LIBRARY library-name]

[OBJTYPE resource-type]

[NATYPE object-type]

[SLKIND message-type]

[LANGUAGE languages]

[DDMDBID dbid] [DDMFNR fnr]

[NATVERS natural-version]

[{DATE date / [FMDATE date-from] [TODATE date-to]}]

[{SIZE size / [FMSIZE size-from] [TOSIZE size-to]}]

[USERID userid]

[TID terminalid]

)
]

```

Note:

For the command **FINDLIB** only the following items are processed: **LIBRARY, DBID, FNR, NAME, CIPHER** and { **PASSWORD/PSW** }

Description of the keywords and the valid values for the single items:

Keyword	Values	Default Value
Object-name	valid Natural object name, ranges ('*', '>', '<') and wildcard ('?') in the usual Natural meaning are allowed.	No default
LIBRARY	valid Natural library name, ranges ('*', '>', '<') and wildcard ('?') in the usual Natural meaning are allowed.	No default
DBID	valid DBID	0 (Current FNAT/FUSER)
FNR	valid FNR	0 (Current FNAT/FUSER)
NAME	valid VSAM name (used on mainframes only)	' ' (Current FNAT/FUSER)
CIPHER	8-character cipher code (used on mainframes only)	' ' (Current FNAT/FUSER)
PASSWORD	8-character Adabas password (used on mainframes only)	' ' (Current FNAT/FUSER)
OBJTYPE	Type of objects to be processed: 'N' (Natural programming objects), 'E' (Error Messages), 'R' (Shared resources), any combination of 'N', 'E' and 'R', '*' (all)	'*' (all)
NATTYPE	Type of Natural objects to be processed: Up to 15 valid external Natural object types (e.g. 'P' for Program), including 'V' for DDMs	'*' (all)
SCKIND	Kind of Natural programming objects to be processed: 'S' (source object), 'C' (cataloged object), 'A' (all saved and/or cataloged objects), 'W' (source and cataloged object if both have the same date and time (stowed)), 'B' (source and cataloged object if both exist) Note: 'W' (stowed) and 'B' (both) are valid for UNLOAD and FIND only, for LOAD or SCAN they are handled in the same way as 'A' (all objects)	'A' (all saved and/or cataloged objects)
MODE	Type of programming mode of the Natural programming objects to be processed: 'R' Reporting mode objects only, 'S' Structured mode objects only, 'A' Any	A' Any
FMNUM	Start number of error messages to be processed: valid error message number from 1 to 9999	1
TONUM	End number of error messages to be processed: valid error message number from 1 to 9999, value must be greater/equal the value of FMNUM	9999 or value of FMNUM (if specified)

Keyword	Values	Default Value
SLKIND	Kind of error messages to be processed: 'S' (short error messages), 'L' (long error messages), 'A' (short and/or long error messages), 'B' (short and long error messages if both exist), Note: 'S' is not possible for the delete function	'A' (short and/or long error messages)
LANGUAGE	Language code(s) of the error messages to be processed: up to 8 valid Natural language codes, '*' (all Natural language codes)	'*' (all Natural language codes)
DDMDBID	DBID of the DDMs to be processed: valid DBID (1 to 65535), 0 (all DBIDs)	0 (No check)
DDMFNR	FNR of the DDMs to be processed: valid FNR (1 to 65535), 0 (all FNRs)	0 (No check)
NATVERS	Natural version of the Natural programming objects to be processed: valid Natural version in the format 'V.R.SM' where V=1-digit version, R=1-digit release, SM=2-digit system maintenance level. Ranges ('*', '>', '<') and wildcard ('?') in the usual Natural meaning are allowed	' ' (No check)
DATE	Save/catalog date of the Natural programming objects and the shared resources to be processed: Date in the format 'YYYY-MM-DD', can be followed (separated by a blank) by a time in the format 'HH:II:SS', special terms for date are allowed: YESTERDAY use the date of the day before the current date TODAY use the current date; can be followed by '+' or '-xxxx', where xxxx is a max. 4-digit number, the date is calculated in days from current date plus or minus this number	' ' (No check)
FMDATE	Start value for the save/catalog date of the Natural programming objects and the shared resources to be processed: Format same as DATE , special terms are allowed here: YEAR start with beginning of current year, MONTH start with beginning of current month, YESTERDAY start with the date of the day before the current date, TODAY start with the current date; can be followed by '+' or '-xxxx', where xxxx is a max. 4-digit number, the start date is calculated in days from current date plus or minus the number	' ' (No check)

Keyword	Values	Default Value
TODATE	End value for the save/catalog date of the Natural programming objects and the shared resources to be processed: Format same as DATE , special terms are allowed here: YEAR end with end of current year, MONTH end with end of current month, YESTERDAY end with the date of the day before the current date, TODAY end with the current date; can be followed by '+' or '-xxxx', where xxxx is a max. 4-digit number, the end date is calculated in days from current date plus or minus the number	' ' (No check) or if (FMDATE specified) high value
SIZE	Size of the Natural programming objects and the shared resources to be processed: max. 7-digit number	0 (No check)
FMSIZE	Start value for the size of the Natural programming objects and the shared resources to be processed: max. 7-digit number	0 (No check)
TOSIZE	End value for the size of the Natural programming objects and the shared resources to be processed: max. 7-digit number	0 (No check) or if (FMSIZE specified) high value
USERID	User ID of the user, who saved/cataloged the Natural programming objects to be processed: 8-digit Natural user ID, ranges ('*', '>', '<') and wildcard ('?') in the usual Natural meaning are allowed.	' ' (No check)
TID	Terminal ID of the terminal, where the Natural programming objects to be processed were saved/cataloged: 8-digit Natural terminal ID as provided by the system variable *INIT-ID, ranges ('*', '>', '<') and wildcard ('?') in the usual Natural meaning are allowed (used on mainframes only)	' ' (No check)
EXCEPT	Has no value. All objects which fulfill the selection criteria before EXCEPT are checked against all parameters between the open and the close brackets following the keyword EXCEPT . If they fulfill these parameters too, they are not processed.	

Notes:

- meaningless parameters are ignored, e.g. date, size and userid have no meaning for error messages.
- **DBID**, **FNR**, **NAME**, **CIPHER** and **PASSWORD/PSW** are not used (ignored) for the **LOAD/SCAN** commands.
They must be specified in the Object Handler parameters (see **LOADFNAT** and **LOADFUSER**).

Natural-related-objects-selection

This selection is used to select Natural related objects, Natural system error messages and Natural command processors.

Syntax:

```
object-name
NATPATH natural-path-name
[{SIZE size / [FMSIZE size-from] [TOSIZE size-to}}]
[{DATE date / [FMDATE date-from] [TODATE date-to}}]
[EXCEPT (
    object-name
    [{SIZE size / [FMSIZE size-from] [TOSIZE size-to}}]
    [{DATE date / [FMDATE date-from] [TODATE date-to}}]
    )
]
```

Description of the keywords and the valid values for the single items:

Keyword	Values	Default Value
Object-name	Name of the related object to be processed.	No default
NATPATH	NATDIR NATGUI_BMP TMP_PATH NATBIN PROFILE_PATH PARM_PATH NATERR	No default
DATE	Save/catalog date of the Natural related objects to be processed: Date in the format 'YYYY-MM-DD', can be followed (separated by a blank) by a time in the format 'HH:II:SS', special terms for date are allowed: YESTERDAY use the date of the day before the current date TODAY use the current date; can be followed by '+' or '-xxxx', where xxxx is a max. 4-digit number, the date is calculated in days from current date plus or minus this number	' ' (No check)
FMDATE	Start value for the date of the Natural related objects to be processed: Format same as DATE , special terms are allowed here: YEAR start with beginning of current year, MONTH start with beginning of current month, YESTERDAY start with the date of the day before the current date, TODAY start with the current date; can be followed by '+' or '-xxxx', where xxxx is a max. 4-digit number, the start date is calculated in days from current date plus or minus the number	' ' (No check)
TODATE	End value for the date of the Natural related objects to be processed: Format same as DATE , special terms are allowed here: YEAR end with end of current year, MONTH end with end of current month, YESTERDAY end with the date of the day before the current date, TODAY end with the current date; can be followed by '+' or '-xxxx', where xxxx is a max. 4-digit number, the end date is calculated in days from current date plus or minus the number	' ' (No check) or if (FMDATE specified) high value
SIZE	Size of the Natural related objects to be processed: max. 7-digit number	0 (No check)
FMSIZE	Start value for the size of the Natural related objects to be processed: max. 7-digit number	0 (No check)
TOSIZE	End value for the size of the Natural related objects to be processed: max. 7-digit number	0 (No check) or if (FMSIZE specified) high value
EXCEPT	Has no value. All objects which fulfill the selection criteria before EXCEPT are checked against all parameters between the open and the close brackets following the keyword EXCEPT . If they fulfill these parameters too, they are not processed.	

Natural-System-Errors-selection

This selection is used to select Natural System error messages.

Syntax:

```

ERROR NATERROR
[[DBID dbid [FNR fnr [[NAME vsam-name] [[CIPHER cipher] [{PASSWORD/PSW} password]]
[[FMNUM error-number-from] [[TONUM error-number-to]
[SLKIND message-type]
[LANGUAGE languages]
[EXCEPT (
    [[FMNUM error-number-from] [[TONUM error-number-to]
    [SLKIND message-type]
    [LANGUAGE languages]
    )
]
```

Description of the keywords and the valid values for the single items:

Keyword	Values	Default Value
DBID	valid DBID (used on mainframes only)	0 (Current FNAT/FUSER)
FNR	valid FNR (used on mainframes only)	0 (Current FNAT/FUSER)
NAME	valid VSAM name (used on mainframes only)	' ' (Current FNAT/FUSER)
CIPHER	8-character cipher code (used on mainframes only)	' ' (Current FNAT/FUSER)
PASSWORD	8-character Adabas password (used on mainframes only)	' ' (Current FNAT/FUSER)
FMNUM	Start number of error messages to be processed: valid error message number from 1 to 9999	1
TONUM	End number of error messages to be processed: valid error message number from 1 to 9999, value must be greater/equal the value of FMNUM	9999 or value of FMNUM (if specified)
SLKIND	Kind of error messages to be processed: 'S' (short error messages), 'L' (long error messages), 'A' (short and/or long error messages), 'B' (short and long error messages if both exist), Note: 'S' is not possible for the delete function	'A' (short and/or long error messages)
LANGUAGE	Language code(s) of the error messages to be processed: up to 8 valid Natural language codes, '*' (all Natural language codes)	'*' (all Natural language codes)
EXCEPT	Has no value. All objects which fulfill the selection criteria before EXCEPT are checked against all parameters between the open and the close brackets following the keyword EXCEPT . If they fulfill these parameters too, they are not processed.	

Note:

DBID, FNR, NAME, CIPHER and **PASSWORD/PSW** are not used (ignored) for the **LOAD/SCAN** commands. They must be specified in the Object Handler parameters (see **LOADFNAT...**)

Natural-Command-Processors-selection

This selection is used to select Natural Command processors.

Syntax:

```

object-name
PROCESSOR ncp-library-name
[DBID ncpdbid FNR ncpfnr [NAME ncpvsam-name] [CIPHER ncpcipher]
[{PASSWORD/PSW} ncppassword]]
[EXCEPT (
    object-name
    [LIBRARY ncp-library-name]
)
]
    
```

Note:

For the command **FINDLIB** only the following items are processed:
PROCESSOR, **DBID**, **FNR**, **NAME**, **CIPHER** and **{PASSWORD/PSW}**

Description of the keywords and the valid values for the single items:

Keyword	Values	Default Value
Object-name	valid Natural command processor name, ranges (*', '>', '<') and wildcard ('?') in the usual Natural meaning are allowed.	No default
PROCESSOR	valid Natural library name, ranges (*', '>', '<') and wildcard ('?') in the usual Natural meaning are allowed.	No default
DBID	valid DBID of the Adabas file where the command processors are located	Value of Lfile 190
FNR	valid FNR of the Adabas file where the command processors are located	Value of Lfile 190
NAME	valid VSAM name (used on mainframes only)	, ,
CIPHER	8-character cipher code of the Adabas file where the command processors are located	, ,
PASSWORD	8-character Adabas password of the Adabas file where the command processors are located	, ,
EXCEPT	Has no value. All objects which fulfill the selection criteria before EXCEPT are checked against all parameters between the open and the close brackets following the keyword EXCEPT . If they fulfill these parameters too, they are not processed.	

Note:

DBID, **FNR**, **NAME**, **CIPHER** and **{PASSWORD/PSW}** are not used (ignored) for the LOAD/SCAN functions. They must be specified in the Object Handler parameters (see LOADNCP..)

External-objects-selection

This selection is used to select external objects

Syntax:

```
object-name
PATH external-path-name
[{SIZE size / [FMSIZE size-from] [TOSIZE size-to}}]
[{DATE date / [FMDATE date-from] [TODATE date-to}}]
[EXCEPT (
    object-name
    [{SIZE size / [FMSIZE size-from] [TOSIZE size-to}}]
    [DATE date / [FMDATE date-from] [TODATE date-to}}]
    )
]
```

Description of the keywords and the valid values for the single items:

Keyword	Values	Default Value
Object-name	Name of the external object to be processed.	No default
PATH	Path name where the external object is located.	No default
DATE	Save/catalog date of the external objects to be processed: Date in the format 'YYYY-MM-DD', can be followed (separated by a blank) by a time in the format 'HH:II:SS', special terms for date are allowed: YESTERDAY use the date of the day before the current date TODAY use the current date; can be followed by '+' or '-xxxx', where xxxx is a max. 4-digit number, the date is calculated in days from current date plus or minus this number	' ' (No check)
FMDATE	Start value for the date of the objects to be processed: Format same as DATE , special terms are allowed here: YEAR start with beginning of current year, MONTH start with beginning of current month, YESTERDAY start with the date of the day before the current date, TODAY start with the current date; can be followed by '+' or '-xxxx', where xxxx is a max. 4-digit number, the start date is calculated in days from current date plus or minus the number	' ' (No check)
TODATE	End value for the date of the external objects to be processed: Format same as DATE , special terms are allowed here: YEAR end with end of current year, MONTH end with end of current month, YESTERDAY end with the date of the day before the current date, TODAY end with the current date; can be followed by '+' or '-xxxx', where xxxx is a max. 4-digit number, the end date is calculated in days from current date plus or minus the number	' ' (No check) or if (FMDATE specified) high value
SIZE	Size of the external objects to be processed: max. 7-digit number	0 (No check)
FMSIZE	Start value for the size of the external objects to be processed: max. 7-digit number	0 (No check)
TOSIZE	End value for the size of the external objects to be processed: max. 7-digit number	0 (No check) or if (FMSIZE specified) high value
EXCEPT	Has no value. All objects which fulfill the selection criteria before EXCEPT are checked against all parameters between the open and the close brackets following the keyword EXCEPT . If they fulfill these parameters too, they are not processed.	

FDT-selection

This selection is used to select Adabas FDTs

Syntax:

```
FDT  
DBID dbid  
  {FNR fnr [NAME vsam-name] [CIPHER cipher] [{PASSWORD/PSW} password]  
  / FMFNR fnr-start TOFNR fnr-end  
  }  
}
```

Description of the keywords and the valid values for the single items:

Keyword	Values	Default Value
DBID	DBID of the FDT to be processed.	No default
FNR	FNR of the FDT to be processed.	No default
NAME	VSAM name of the FDT to be processed (used on mainframes only)	No default
CIPHER	8-character cipher code of the FDT to be processed.	No default
PASSWORD	8-character Adabas password of the FDT to be processed.	No default
FMFNR	Start file number of the FDT to be processed (FIND and UNLOAD function only)	No default
TOFNR	End file number of the FDT to be processed (FIND and UNLOAD function only)	No default

Object List

An "Object list" consists of a list of object specifications, which are to be processed by the Object Handler.

The following syntax is valid for an "Object list" :

```
TYPE LIST
[Object-type-and-location
 ( Object-name-description... ) ]...
```

Note: Each item (except the round brackets) must start at a new line and end in the same line.

Syntax of Object-type-and-location

For Natural objects:

```
LIBRARY library-name
[ DBID dbid FNR fnr [NAME vsam-name / [PASSWORD/PSW password]
  [CIPHER cipher]
]
[OBJTYPE resource-type]
```

For Natural system error messages:

```
ERROR NATERROR
[ DBID dbid FNR fnr
  [NAME vsam-name / [PASSWORD/PSW password][CIPHER cipher] ]
]
```

For Natural command processor sources:

```
PROCESSOR ncp-library-name
[ DBID dbid FNR fnr
  [NAME vsam-name / [PASSWORD/PSW password][CIPHER cipher] ]
]
```

For Natural related objects:

```
NATPATH natural-path-name
```

For External objects:

```
PATH natural-path-name
```

For FDTs:

```
FDT
```

Note: No ranges are allowed for library-name and ncp-library-name.

Syntax of Object-name-description

For Natural objects:

```
{object-name [SCKIND object-kind]
 /
 error-number [SLKIND message-type] [LANGUAGE languages]
 /
 FMNUM error-number-from TONUM error-number-to [SLKIND message-type]
 [LANGUAGE languages]
 }
```

For Natural system error messages:

```
{ error-number [SLKIND message-type] LANGUAGE languages]
 /
 FMNUM error-number-from TONUM error-number-to [SLKIND message-type]
 [LANGUAGE languages]
 }
```

For Natural command processor sources:

```
object-name
```

For Natural related objects:

```
Related-object-name
```

For External objects:

```
External-object-name
```

For FDTs:

```
[DBID dbid FNR fnr [[PASSWORD/PSW password][CIPHER cipher] ]
```

Example:

```
TYPE LIST
LIBRARY LIB-1 OBJTYPE N      /* process Natural objects from library 'LIB-1'
 ( A* SCKIND S              /* all sources whose name starts with 'A'
 B1                          /* source and/or cataloged of object 'B1'
 CDE> SCKIND C )           /* all cataloged whose name is greater/equal 'CDE'
 /*                          /* Comment line
 LIBRARY LIB-2              /* process Natural objects from library 'LIB-1'
 /*                          /* including error messages and shared resources
 ( *                          /* source and/or cataloged of all objects
 /*                          /* including shared resources
 FMNUM 1 TONUM 100         /* error messages from 1 to 100
 )
```

Parameter-Setting

"Parameter setting" means the setting for the command.

Syntax:

```

WITH
{
( parameter-workplan )
/
[[NAME old-name] NEWNAME new-name]
[[LIBRARY old-library-name] NEWLIBRARY old-library-name]
[LOADFNATDBID fnat-dbid LOADFNATFNR fnst-fnr [LOADFNATNAME vsam-name]
  [LOADFNATCIPHER cipher] [{LOADFNATPASSWORD/LOADFNATPSW} password]]
[LOADFUSERDBID fuser-dbid LOADFUSERFNR fuser-fnr
  [LOADFUSERNAME fuser-vsam-name] [LOADFUSERCIPHER fuser-cipher]]
  [{LOADFUSERPASSWORD/LOADFUSERPSW} fuser-password]]
[LOADNCPDBID ncp-file-dbid LOADNCPFNR ncp-file-fnr
  [LOADNCPNAME ncp-file-vsam-name] [LOADNCPCIPHER ncp-file-cipher]
  [{LOADNCPPASSWORD/LOADNCPPSW} ncp-file-password]]
[[FDTDBID old-fdt-dbid FDTFNR old-fdt-fnr] NEWFDTDBID newfdtdbid
  NEWFDTFNR newfdtfnr ]
[ERRNUMDIFF modification of error-message-range]
[[LANGUAGE old-language] NEWLANGUAGE new-language]
[[DATE old-date] NEWDATE new-date]
[[USERID old-userid] NEWUSERID new-userid]
[[TID old-terminalid] NEWTID new-terminalid]
[[PATH old-external-path-name] NEWPATH new-external-path-name]
}

```

Description of the keywords and the valid values for the single items:

Keyword	Values
NAME	Name to be checked if NEWNAME is specified
NEWNAME	New object name
LIBRARY	Name to be checked if NEWLIBRARY is specified
NEWLIBRARY	New library name
LOADFNATDBID	DBID for the FNAT libraries (for LOAD function only)
LOADFNATFNR	FNR for the FNAT libraries (for LOAD function only)
LOADFNATNAME	FNAT VSAM name (for LOAD function only) (used on mainframes only)
LOADFNATCIPHER	FNAT cipher code (for LOAD function only) (used on mainframes only)
LOADFNATPASSWORD	FNAT Adabas password (for LOAD function only) (used on mainframes only)
LOADFUSERDBID	DBID for the FUSER libraries (for LOAD function only)
LOADFUSERFNR	FNR for the FUSER libraries (for LOAD function only)
LOADFUSERNAME	valid FUSER VSAM name (for LOAD function only) (used on mainframes only)
LOADFUSERCIPHER	FUSER cipher code (for LOAD function only) (used on mainframes only)
LOADFUSERPASSWORD	FUSER Adabas password (for LOAD function only) (used on mainframes only)
LOADNCPDBID	DBID for the Adabas file for Natural command processors (for LOAD function only)

Keyword	Values
LOADNCPFNR	FNR for the Adabas file for Natural command processors (for LOAD function only)
LOADNCPNAME	VSAM name for the Adabas file for Natural command processors (for LOAD function only) (used on mainframes only)
LOADNCPIPHER	cipher code for the Adabas file for Natural command processors (for LOAD function only) (used on mainframes only)
LOADNCPASSWORD	Adabas password for the Adabas file for Natural command processors (for LOAD function only) (used on mainframes only)
FDTDBID	DBID of the FDT to be checked if NEWFDTDBID is specified
NEWFDTDBID	New DBID for the FDT
FDTFNR	FNR of the FDT to be checked if NEWFDTFNR is specified
NEWFDTFNR	New FDT for the FNR
ERRNUMDIFF	Number (positive or negative) which is to be added to the error messages during UNLOAD or LOAD function
LANGUAGE	Error messages language code(s) to be checked if NEWLANGUAGE is specified
NEWLANGUAGE	New error message language code(s)
DATE	Object date to be checked if NEWDATE is specified
NEWDATE	New object date
USERID	User ID to be checked if NEWUSERID is specified
NEWUSERID	New user ID
TID	Terminal ID to be checked if NEWTID is specified (used on mainframes only)
NEWTID	New terminal ID (used on mainframes only)
PATH	Path name to be checked if NEWPATH is specified
NEWPATH	New path name

Notes:

- new-date has the same possible values as date, and additionally **TOMORROW**
- parameters not applicable to the processed selection criterion are ignored
- **ERRNUMDIFF** only can be specified when **FMNUM** and **TONUM** are specified in selection criterion, otherwise it is not possible to check if the result is valid.
- 'old-language' and 'new-language' may contain up to 8 valid Natural language codes.
If 'language' contains more than 1 language code, 'new-language' must contain the same number of language codes. Each language code 'language' is replaced by language code in the corresponding position of 'new-language'. If 'language' is not specified, 'new-language' must not contain more than 1 language code.
- new-date can be a valid date (format 'YYYY-MM-DD') or a date range with '*' as last character
- **LOADFNAT**, **LOADFUSER..** and **LOADNCP..** are used for the **LOAD**-command only, they are ignored for other functions.
LOADFNAT.. is used for libraries starting with SYS (except SYSTEM),
LOADFUSER is used for libraries not starting with SYS (except SYSTEM),
LOADNCP.. is used for Natural Command Processors.

Option-Setting

Option setting gives a setting for the object handler command.

Syntax:

```

WHERE
{
( option-workplan )
/
[REPLACE {[ALL] / OBSOLETE / EXCEPT }]
[ { NOREPORT / NEWREPORT [file-name] / REPORT [file-name] } ]
[ { NORESTART / RESTART [file-name] } ]
[NUMBERPROCESS number]
[ { TRANSFER
[CONVERSION-TABLE { SYSTEM-TABLE / USER-TABLE [conversion table] ]
[SUBSTITUTE]
[INCLUDE-LINE-NUMBERS]
[UPPERCASE-TRANSLATION]
[INCORPORATE-FREE-RULES] ]
/
[XREF {ON / OFF / DOC / FORCE / SPECIAL} ]
}
]
[FDIC (dbid, fnr, password, cipher)]
[FSEC (dbid, fnr, password, cipher)]
[ { { NEWWORKFILE / WORKFILE } file-name / PC [file-name] } ]
}
    
```

Description of the keywords and the valid values for the single items:

Option	Function	Meaning	Valid for commands
REPLACE {[ALL] / OBSOLETE / EXCEPT }	Replace objects	If option is set, existing objects will be replaced according to the given option: ALL is the default, it means all objects will be replaced OBSOLETE means that only those objects with an older date than in the load file will be replaced EXCEPT means that all objects will be replaced except the newer	LOAD, LOADALL
NOREPORT	report file setting	The result will not be written in a report file. This is the default setting for the FIND and FINDLIB commands.	All commands
NEWREPORT [file-name]	report file setting	The result will be written into work file 4 or into file-name, an existing file will be overwritten.	All commands

Option	Function	Meaning	Valid for commands
REPORT [file-name]	report file setting	REPORT [file-name]: The result will be written into work file 4 or into file-name. This is the default setting for the UNLOAD, LOAD, LOADALL, SCAN, SCANALL and DELETE commands.	All commands
NORESTART	Write restart information.	No restart file is written.	LOAD
RESTART [file-name]	Write restart information.	Restart information is written into work file 6 or file-name.	LOAD
TRANSFER	Set TRANSFER mode.	The data is written/read in TRANSFER format.	UNLOAD, LOAD, SCAN
NUMBERPROCESS	Number of objects to be processed.	After the specified number the load/scan functions is interrupted.	LOAD, SCAN
CONVERSION-TABLE { SYSTEM-TABLE / USER-TABLE [conversion-program]}	Data conversion during processing in TRANSFER format.	SYSTEM-TABLE : Use Natural internal conversion table. USER-TABLE : if the conversion-program is specified use it (must be located in library SYSOBJH or one of its steplib, see example OTNCONAE and OTNCONEA in library SYSOBJH). If no conversion-program is specified, the corresponding conversion table in NATCONV .INI ([ISO8859_1->EBCDIC] or [EBCDIC->ISO8859_1]) is used.	UNLOAD, LOAD, SCAN
SUBSTITUTE	Substitution of line references into labels during processing in TRANSFER format.	This option only applies if your source-code line numbers are used for statement reference. If you select this option and if line numbers are used as references in the source code, the line numbers of referenced lines and the line number references are replaced with labels. The sources are not modified in the database.	UNLOAD
INCLUDE-LINE-NUMBERS	Unloading of line numbers during processing in TRANSFER format.	By default, line numbers in Natural objects are not transferred. If you select this option, line numbers in Natural will be transferred.	UNLOAD
UPPERCASE-TRANSLATION	Translate source code into upper case during processing in TRANSFER format.	If you select this option, any source code to be loaded is translated to upper case.	LOAD

Option	Function	Meaning	Valid for commands
<u>INCORPORATE-FREE-RULES</u>	Incorporate source text of free rules into map sources during processing in TRANSFER format.	If you select this option and Predict is installed, Predict rules associated with the map are incorporated into the map source.	UNLOAD
XREF {ON /OFF/DOC /FORCE/SPECIAL}	Load / unload XREF data of cataloged Natural objects.	Default: XREF OFF. ON: If a cataloged object has cross-reference data, these are unloaded with the object. (UNLOAD) Load cataloged object and its cross-reference data only if cross-reference exist. (LOAD) OFF: Do not process XREF data. (LOAD and UNLOAD) DOC: Load cataloged object only if a Predict entry exist for it. (LOAD) FORCE: Load cataloged object and its cross-reference data only if cross-reference data exist and if a Predict entry exists for it. (LOAD) SPECIAL: Load cataloged object and its cross-reference data (if any). (LOAD)	UNLOAD, LOAD
[FDIC (dbid, fnr, password, cipher)]	FDIC specification for processing XREF data or Predict rules.		UNLOAD, LOAD, DELETE
[FSEC (dbid, fnr, password, cipher)]	FSEC specification.		All commands
{ <u>NEWWORKFILE</u> / <u>WORKFILE</u> } file-name	Work file specification.	The UNLOAD / LOAD will be done into / from the Natural work file 1 if <u>NEWWORKFILE</u> is specified, the work file will be written from the beginning, else the new data will be appended	UNLOAD, LOAD, SCAN, FIND, FINDLIB
PC [file-name]	Work file specification (used on mainframes only).	The UNLOAD / LOAD will be done into / from a PC work file using Entire Connection.	UNLOAD, LOAD, SCAN, FIND, FINDLIB

Batch or Direct Command Calls

For direct commands and in batch mode, the Object Handler is called using the system command SYSOBJH or by executing the program SYSOBJH in library SYSOBJH.

The commands to the Object Handler are read from standard input into 10 variables (each 248 bytes long). If the command exceeds 248 bytes, the single parts must be separated by the input delimiter (session parameter ID).

Several commands can be issued to SYSOBJH.

The last command in the command sequence must be '.' or 'STOP' or 'END' or 'QUIT' or 'FIN' (where 'FIN' ends the Natural session).