

Screen Design

This chapter provides options to define a general screen layout:

- Control of Function-Key Lines - Terminal Command %Y
- Control of the Message Line - Terminal Command %M
- Assigning Colors to Fields - Terminal Command %=
- Outlining - Terminal Command %D=B
- Statistics Line/Infoline - Terminal Command %X
- Windows
- Standard/Dynamic Layout Maps
- Multilingual User Interfaces
- Skill-Sensitive User Interfaces

Control of Function-Key Lines - Terminal Command %Y

With the terminal command %Y you can define how and where the Natural function-key lines are to be displayed.

Below is information on:

- Format of Function-Key Lines
- Positioning of Function-Key Lines
- Cursor-Sensitivity

Format of Function-Key Lines

The following terminal commands are available for defining the format of function-key lines:

%YN

The function-key lines are displayed in tabular Software AG format:

```

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help           Exit                                     Canc

```

%YS

The function-key lines display the keys sequentially and only show those keys to which names have been assigned (PF1=*value*, PF2=*value*, etc.):

```
Command ===>
PF1=Help,PF3=Exit,PF12=Canc
```

%YP

The function-key lines are displayed in PC-like format, that is, sequentially and only showing those keys to which names have been assigned (F1=*value*, F2=*value*, etc.):

```
Command ===>
F1=Help,F3=Exit,F12=Canc
```

Other Display Options

Various other command options are available for function-key lines, such as:

- single- and double-line display,
- intensified display,
- reverse video display,
- color display.

For details on these options, see *%Y - Control of PF-Key Lines* in the *Terminal Commands* documentation.

Positioning of Function-Key Lines

%YB

The function-key lines are displayed at the bottom of the screen.

```
16:50:53          ***** NATURAL *****          2002-12-18
User SAG          - Main Menu -                      Library XYZ

                Function
                _ Development Functions
                _ Development Environment Settings
                _ Maintenance and Transfer Utilities
                _ Debugging and Monitoring Utilities
                _ Example Libraries
                _ Other Products
                _ Help
                _ Exit Natural Session

Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help      Exit                                  Canc
```

%YT

The function-key lines are displayed at the top of the screen.

```

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help           Exit                                     Canc
16:50:53          ***** NATURAL *****                2002-12-18
User SAG          - Main Menu -                            Library XYZ

                Function

                _ Development Functions
                _ Development Environment Settings
                _ Maintenance and Transfer Utilities
                _ Debugging and Monitoring Utilities
                _ Example Libraries
                _ Other Products
                _ Help
                _ Exit Natural Session

Command ===>

```

%Ynn

The function-key lines are displayed on line *nn* of the screen. In the example below the function-key line has been set to line 10:

```

16:50:53          ***** NATURAL *****                2002-12-18
User SAG          - Main Menu -                            Library XYZ

                Function

                _ Development Functions
                _ Development Environment Settings
                _ Maintenance and Transfer Utilities
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help           Exit                                     Canc
                - Debugging and Monitoring Utilities
                _ Example Libraries
                _ Other Products
                _ Help
                _ Exit Natural Session

Command ===>

```

Cursor-Sensitivity

%YC

This command makes the function-key lines cursor-sensitive. This means that they act like an action bar on a PC screen: you just move the cursor to the desired function-key number or name and press Enter, and Natural reacts as if the corresponding function key had been pressed.

To switch cursor-sensitivity off, you enter %YC again (toggle switch).

By using %YC in conjunction with tabular display format (%YN) and having only the function-key names displayed (%YH), you can equip your applications with very comfortable action bar processing: the user merely has to select a function name with the cursor and press Enter, and the function is executed.

Control of the Message Line - Terminal Command %M

Various options of the terminal command %M are available for defining how and where the Natural message line is to be displayed.

Below is information on:

- Positioning the Message Line
- Message Line Protection
- Message Line Color

Positioning the Message Line

%MB

The message line is displayed at the bottom of the screen.

```

16:50:53          ***** NATURAL *****          2002-12-18
User SAG          - Main Menu -          Library XYZ

                Function

                _ Development Functions
                _ Development Environment Settings
                _ Maintenance and Transfer Utilities
                _ Debugging and Monitoring Utilities
                _ Example Libraries
                _ Other Products
                _ Help
                _ Exit Natural Session

Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help           Exit                               Canc
Please enter a function.

```

%MT

The message line is displayed at the top of the screen.

```

Please enter a function.
16:50:53          ***** NATURAL *****          2002-12-18
User SAG          - Main Menu -          Library XYZ

                Function

                _ Development Functions
                _ Development Environment Settings
                _ Maintenance and Transfer Utilities
                _ Debugging and Monitoring Utilities
                _ Example Libraries
                _ Other Products
                _ Help
                _ Exit Natural Session

Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help           Exit

```

Other options for the positioning of the message line are described in *%M - Control of Message Line* in the *Terminal Commands* documentation.

Message Line Protection

%MP

The message line is switched from unprotected to protected mode or vice versa. In unprotected mode, the message line can also be used for terminal input.

Message Line Color

%M=*color-code*

The message line is displayed in the specified color (for an explanation of color codes, see the session parameter CD as described in the *Parameter Reference*).

Assigning Colors to Fields - Terminal Command %=

You can use the terminal command %= to assign colors to field attributes for programs that were originally not written for color support. The command causes all fields/text defined with the specified attributes to be displayed in the specified color.

If predefined color assignments are not suitable for your terminal type, you can use this command to override the original assignments with new ones.

You can also use the %= terminal command within Natural editors, for example to define color assignments dynamically during map creation.

Codes	Description
<i>blank</i>	Clear color translate table.
F	Newly defined colors are to override colors assigned by the program.
N	Color attributes assigned by program are not to be modified.
O	Output field.
M	Modifiable field (output and input).
T	Text constant.
B	Blinking
C	Italic
D	Default
I	Intensified
U	Underlined
V	Reverse video
BG	Background
BL	Blue
GR	Green
NE	Neutral
PI	Pink
RE	Red
TU	Turquoise
YE	Yellow

Example:

```
%=TI=RE,OB=YE
```

This example assigns the color red to all intensified text fields and yellow to all blinking output fields.

Outlining - Terminal Command %D=B

Outlining (boxing) is the capability to generate a line around certain fields when they are displayed on the terminal screen. Drawing such "boxes" around fields is another method of showing the user the lengths of fields and their positions on the screen.

Outlining is only available on certain types of terminals, usually those which also support the display of double-byte character sets.

The terminal command %D=B is used to control outlining. For details on this command, see the relevant section in the *Terminal Commands* documentation.

Statistics Line/Infoline - Terminal Command %X

The terminal command %X controls the display of the Natural statistics line/infoline. The line can be used either as a statistics line or as an infoline, but not both at the same time.

Below is information on:

- Statistics Line
- Infoline

Statistics Line

To turn the statistics line on/off, enter the terminal command %X (this is a toggle function). If you set the statistics line on, you can see statistical information, such as:

- the number of bytes transmitted to the screen during the previous screen operation,
- the logical line size of the current page,
- the physical line size of the window.

For full details regarding the statistics line, see the terminal command %X as described in the *Terminal Commands* documentation.

The example below shows the statistics line displayed at the bottom of the screen:

```

>
All      . . . . + . . . . 1 . . . . + . . . . 2 . . . . + . . . . 3 . . . . + . . . . 4 . . . . + . . . . 5 . . . . + . . . . 6 . . . . + . . . . 7 . . . .
0010 SET CONTROL 'XT'
0020 SET CONTROL 'XI+'
0030 DEFINE PRINTER (2) OUTPUT 'INFOLINE'
0040 WRITE (2) 'EXECUTING' *PROGRAM 'BY' *INIT-USER
0050 WRITE 'TEST OUTPUT'
0070 END
0080
0090
0100
0110
0120
0130
0140
0150
0160
0170
0180
0190
0200
IO=264,AI =292,L=0 C= ,LS=80,P =23,PLS=80,PCS=24,FLD=82,CLS=1,ADA=0

```


Infoline

You can also use the statistics line as an *infoline* where status information can be displayed, for example, for debugging purposes, or you can use it as a separator line (as defined by SAA standards).

To define the statistics line as an infoline, you use the terminal command %XI+.

Once you have activated the infoline with the above command, you can define the infoline as the output destination for data with the DEFINE PRINTER statement as demonstrated in the example below:

```
SET CONTROL 'XT'
SET CONTROL 'XI+'
DEFINE PRINTER (2) OUTPUT 'INFOLINE'
WRITE (2) 'EXECUTING' *PROGRAM 'BY' *INIT-USER
WRITE 'TEST OUTPUT'
END
```

When the above program is run, the status information is displayed in the infoline at the top of the output display:

EXECUTING POS	BY SAG	
Page 1		2001-01-22 10:56:06
TEST OUTPUT		

For further details on the statistics line/infoline, see the terminal command %X as described in the *Terminal Commands* documentation.

Windows

Below is information on:

- What is a Window?
- DEFINE WINDOW Statement
- INPUT WINDOW Statement

What is a Window?

A *window* is that segment of a logical page, built by a program, which is displayed on the terminal screen.

A *logical page* is the output area for Natural; in other words the logical page contains the current report/map produced by the Natural program for display. This logical page may be larger than the physical screen.

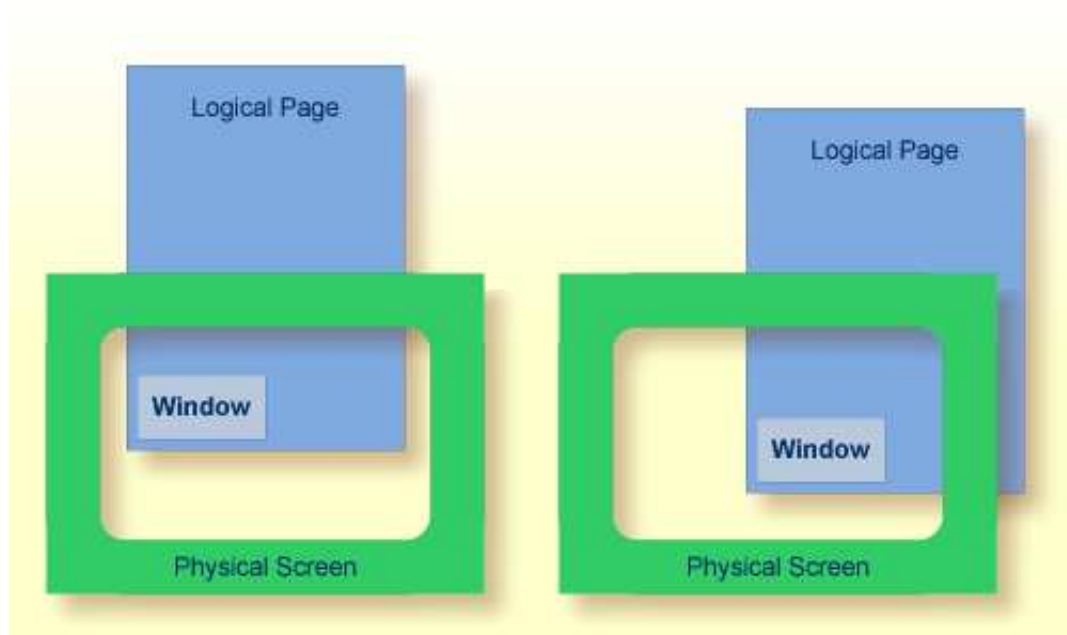
There is always a window present, although you may not be aware of its existence. Unless specified differently (by a DEFINE WINDOW statement), the size of the window is identical to the physical size of your terminal screen.

You can manipulate a window in two ways:

- You can control the size and position of the window on the *physical screen*.
- You can control the position of the window on the *logical page*.

Positioning on the Physical Screen

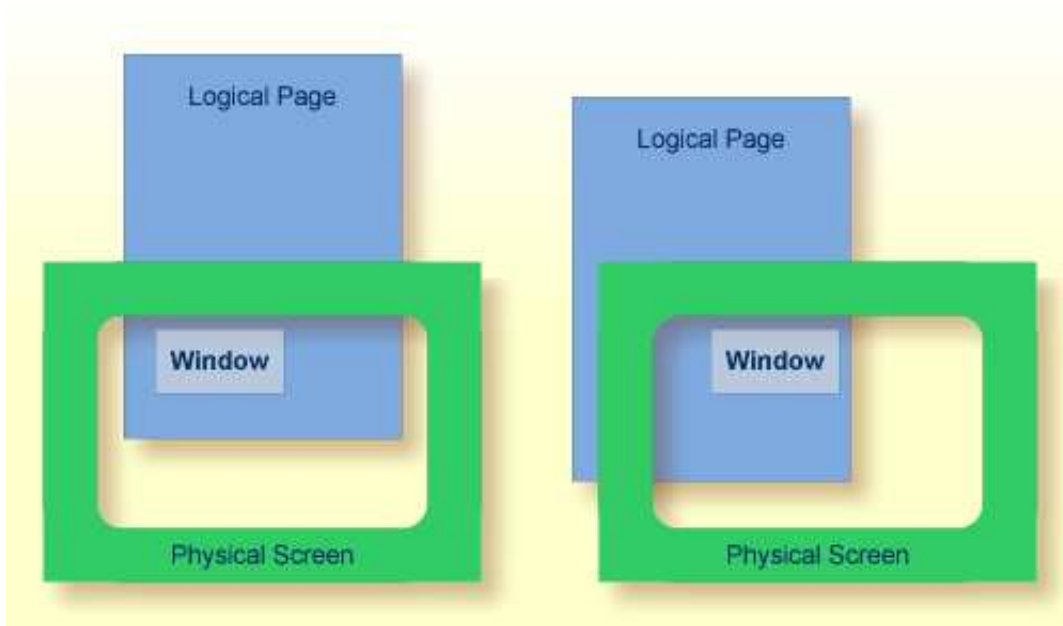
The figure below illustrates the positioning of a window on the physical screen. Note that the same section of the logical page is displayed in both cases, only the position of the window on the screen has changed.



Positioning on the Logical Page

The figure below illustrates the positioning of a window on the logical page.

When you change the position of the window on the *logical page*, the size and position of the window on the *physical screen* will remain unchanged. In other words, the window is not moved over the page, but the page is moved "underneath" the window.



DEFINE WINDOW Statement

You use the `DEFINE WINDOW` statement to specify the size, position and attributes of a window on the *physical screen*.

A `DEFINE WINDOW` statement does not activate a window; this is done with a `SET WINDOW` statement or with the `WINDOW` clause of an `INPUT` statement.

Various options are available with the `DEFINE WINDOW` statement. These are described below in the context of the following example. It refers to Natural's default terminal type setting; see also terminal command `%T=` and profile parameter `TTYTYPE`).

The following program defines a window on the physical screen.

```

** Example 'WINDX01': DEFINE WINDOW
*****
DEFINE DATA LOCAL
1 COMMAND (A10)
END-DEFINE
*
DEFINE WINDOW TEST
    SIZE 5*25
    BASE 5/40
    TITLE 'Sample Window'
    CONTROL WINDOW
    FRAMED POSITION SYMBOL BOTTOM LEFT
*
INPUT WINDOW='TEST' WITH TEXT 'message line'
    COMMAND (AD=I'_' ) /
    'dataline 1' /
    'dataline 2' /
    'dataline 3' 'long data line'
*
IF COMMAND = 'TEST2'
    FETCH 'WINDX02'
ELSE

```

```

IF COMMAND = '.'
  STOP
ELSE
  REINPUT 'invalid command'
END-IF
END-IF
END

```

The window-name identifies the window. The name may be up to 32 characters long. For a window name, the same naming conventions apply as for user-defined variables. Here the name is TEST.

The window size is set with the SIZE option. Here the window is 5 lines high and 25 columns (positions) wide.

The position of the window is set by the BASE option. Here the top left-hand corner of the window is positioned on line 5, column 40.

With the TITLE option, you can define a title that is to be displayed in the window frame (of course, only if you have defined a frame for the window).

With the CONTROL clause, you determine whether the PF-key lines, the message line and the statistics line are displayed in the window or on the full physical screen. Here CONTROL WINDOW causes the message line to be displayed inside the window. CONTROL SCREEN would cause the lines to be displayed on the full physical screen outside the window. If you omit the CONTROL clause, CONTROL WINDOW applies by default.

With the FRAMED option, you define that the window is to be framed. This frame is then cursor-sensitive. Where applicable, you can page forward, backward, left or right within the window by simply placing the cursor over the appropriate symbol (<, -, +, or >; see POSITION clause) and then pressing Enter. In other words, you are moving the *logical page* underneath the window on the physical screen. If no symbols are displayed, you can page backward and forward within the window by placing the cursor in the top frame line (for backward positioning) or bottom frame line (for forward positioning) and then pressing Enter.

With the POSITION clause of the FRAMED option, you define that information on the position of the window on the logical page is to be displayed in the frame of the window. This applies only if the logical page is larger than the window; if it is not, the POSITION clause will be ignored. The position information indicates in which directions the logical page extends above, below, to the left and to the right of the current window.

If the POSITION clause is omitted, POSITION SYMBOL TOP RIGHT applies by default.

POSITION SYMBOL causes the position information to be displayed in form of symbols: "More: < - + >". The information is displayed in the top and/or bottom frame line.

TOP/BOTTOM determines whether the position information is displayed in the top or bottom frame line.

LEFT/RIGHT determines whether the position information is displayed in the left or right part of the frame line.

You can define which characters are to be used for the frame with the terminal command %F=c hv.

c	The first character will be used for the four <i>corners</i> of the window frame.
h	The second character will be used for the <i>horizontal</i> frame lines.
v	The third character will be used for the <i>vertical</i> frame lines.

Example:

```
%F=+-!
```

The above command makes the window frame look like this:

```
+-----+
!               !
!               !
!               !
!               !
+-----+
```

INPUT WINDOW Statement

The INPUT WINDOW statement activates the window defined in the DEFINE WINDOW statement. In the example, the window TEST is activated. Note that if you wish to output data in a window (for example, with a WRITE statement), you use the SET WINDOW statement.

When the above program is run, the window is displayed with one input field COMMAND. The session parameter AD is used to define that the value of the field is displayed intensified and an underscore is used as filler character.

Output of Program WINDX01:

```
> r                                     > + Program      WINDX01  Lib SYSEXP
Top  ....+....1....+....2....+....3....+....4....+....5....+....6....+....7...
0010 ** Example 'WINDX01': DEFINE WINDOW
0020 ***** +----Sample Window-----+ *****
0030 DEFINE DATA LOCAL                ! message line      !
0040 1 COMMAND (A10)                   ! COMMAND _____ !
0050 END-DEFINE                        ! dataline 1        !
0060 *                                  +More:      + >-----+
0070 DEFINE WINDOW TEST
0080     SIZE 5*25
0090     BASE 5/40
0100     TITLE 'Sample Window'
0110     CONTROL WINDOW
0120     FRAMED POSITION SYMBOL BOTTOM LEFT
0130 *
0140 INPUT WINDOW='TEST' WITH TEXT 'message line'
0150     COMMAND (AD=I'_' ) /
0160     'dataline 1' /
0170     'dataline 2' /
0180     'dataline 3' 'long data line'
0190 *
0200 IF COMMAND = 'TEST2'
      ....+....1....+....2....+....3....+....4....+....5....+... S 29  L 1
```

In the bottom frame line, the position information `More: + >` indicates that there is more information on the logical page than is displayed in the window.

To see the information that is further down on the logical page, you place the cursor in the bottom frame line on the plus (+) sign and press Enter.

The window is now moved downwards. Note that the text `long data line` does not fit in the window and is consequently not fully visible.

```

> r                                     > + Program      WINDX01  Lib SYSEXP
Top  ....+....1....+....2....+....3....+....4....+....5....+....6....+....7...
0010 ** Example 'WINDX01': DEFINE WINDOW
0020 *****+-----Sample Window-----+ *****
0030 DEFINE DATA LOCAL                ! message line      !
0040 1 COMMAND (A10)                   ! dataline 3 long data !
0050 END-DEFINE                        ! dataline 2        !
0060 *                                  +More:  -  >-----+
0070 DEFINE WINDOW TEST
0080     SIZE 5*25
0090     BASE 5/40
0100     TITLE 'Sample Window'
0110     CONTROL WINDOW
0120     FRAMED POSITION SYMBOL BOTTOM LEFT
0130 *
0140 INPUT WINDOW='TEST' WITH TEXT 'message line'
0150     COMMAND (AD=I'_' ) /
0160     'dataline 1' /
0170     'dataline 2' /
0180     'dataline 3' 'long data line'
0190 *
0200 IF COMMAND = 'TEST2'
      ....+....1....+....2....+....3....+....4....+....5....+... S 29  L 1

```

To see this hidden information to the right, you place the cursor in the bottom frame line on the less-than symbol (>) and press Enter. The window is now moved to the right on the logical page and displays the previously invisible word line:

```

> r                                     > + Program      WINDX01  Lib SYSEXP
Top  ....+....1....+....2....+....3....+....4....+....5....+....6....+....7..
0010 ** Example 'WINDX01': DEFINE WINDOW
0020 *****+-----Sample Window-----+ *****
0030 DEFINE DATA LOCAL                ! message line          !
0040 1 COMMAND (A10)                   ! line                  ! <==
0050 END-DEFINE                        !                      !
0060 *                                  +More: < -      -----+
0070 DEFINE WINDOW TEST
0080     SIZE 5*25
0090     BASE 5/40
0100     TITLE 'Sample Window'
0110     CONTROL WINDOW
0120     FRAMED POSITION SYMBOL BOTTOM LEFT
0130 *
0140 INPUT WINDOW='TEST' WITH TEXT 'message line'
0150     COMMAND (AD=I'_' ) /
0160     'dataline 1' /
0170     'dataline 2' /
0180     'dataline 3' 'long data line'
0190 *
0200 IF COMMAND = 'TEST2'
      ....+....1....+....2....+....3....+....4....+....5....+... S 29  L 1

```

Multiple Windows

You can, of course, open multiple windows. However, only one Natural window is active at any one time, that is, the most recent window. Any previous windows may still be visible on the screen, but are no longer active and are ignored by Natural. You may enter input only in the most recent window. If there is not enough space to enter input, the window size must be adjusted first.

When TEST2 is entered in the COMMAND field, the program WINDX02 is executed.

```

** Example 'WINDX02': DEFINE WINDOW
*****
DEFINE DATA LOCAL
1 COMMAND (A10)
END-DEFINE
*
DEFINE WINDOW TEST2
  SIZE 5*30
  BASE 15/40
  TITLE 'Another Window'
  CONTROL SCREEN
  FRAMED POSITION SYMBOL BOTTOM LEFT
*
INPUT WINDOW='TEST2' WITH TEXT 'message line'
  COMMAND (AD=I'_' ) /
  'dataline 1' /
  'dataline 2' /
  'dataline 3' 'long data line'
*
IF COMMAND = 'TEST'
  FETCH 'WINDX01'
ELSE
  IF COMMAND = '.'
    STOP
  ELSE

```

```

    REINPUT 'invalid command'
  END-IF
END-IF
END

```

A second window is opened. The other window is still visible, but it is inactive.

```

message line
> r
Top .....1.....2.....3.....4.....5.....6.....7..
0010 ** Example 'WINDX01': DEFINE WINDOW
0020 ***** +----Sample Window-----+ *****
0030 DEFINE DATA LOCAL ! message line ! Inactive
0040 1 COMMAND (A10) ! COMMAND TEST2_____ ! Window
0050 END-DEFINE ! dataline 1 ! <==
0060 * +More: + >-----+
0070 DEFINE WINDOW TEST
0080 SIZE 5*25
0090 BASE 5/40
0100 TITLE 'Sample Window'
0110 CONTROL WINDOW
0120 FRAMED POSITION SYMBOL B +-----Another Window-----+ Currently
0130 * ! COMMAND _____ ! Active
0140 INPUT WINDOW='TEST' WITH TEXT ' ! dataline 1 ! Window
0150 COMMAND (AD=I'_' ) / ! dataline 2 ! <==
0160 'dataline 1' / +More: +-----+
0170 'dataline 2' /
0180 'dataline 3' 'long data line'
0190 *
0200 IF COMMAND = 'TEST2'

```

Note that for the new window the message line is now displayed on the full physical screen (at the top) and not in the window. This was defined by the `CONTROL SCREEN` clause in the `WINDX02` program.

For further details on the statements `DEFINE WINDOW`, `INPUT WINDOW` and `SET WINDOW`, see the corresponding descriptions in the *Statements* documentation.

Standard/Dynamic Layout Maps

Standard Layout Maps

As described in the section *Map Editor Tutorial*, a *standard layout* can be defined in the map editor. This layout guarantees a uniform appearance for all maps that reference it throughout the application.

When a map that references a standard layout is initialized, the standard layout becomes a fixed part of the map. This means that if this standard layout is modified, all affected maps must be re-cataloged before the changes take effect.

Dynamic Layout Maps

In contrast to a standard layout, a *dynamic layout* does not become a fixed part of a map that references it, rather it is executed at runtime.

This means that if you define the layout map as "dynamic" on the Define Map Settings For MAP screen in the map editor (see the example below), any modifications to the layout map are also carried out on all maps that reference it. The maps need not be re-cataloged.

Delimiters				Format		Context	
08:46:18	Define Map Settings for MAP						2001-01-22
Cls	Att	CD	Del	Page Size	23	Device Check
T	D		BLANK	Line Size	79	WRITE Statement
T	I		?	Column Shift	...	0 (0/1)	INPUT Statement
A	D		_	Layout	STAN1	Help
A	I)	dynamic	Y (Y/N)	as field default
A	N		a	Zero Print	N (Y/N)	N (Y/N)
M	D		&	Case Default	...	UC (UC/LC)	
M	I		:	Manual Skip	...	N (Y/N)	Automatic Rule Rank
O	D		+	Decimal Char	Profile Name
O	I		(Standard Keys	..	Y (Y/N)	SYSPROF
				Justification	..	L (L/R)	Filler Characters
				Print Mode	_	-----
				Control Var	_____	Optional, Partial
				Apply changes only to new fields?	N	(Y/N)	Required, Partial
							Optional, Complete
							Required, Complete

							Optional, Partial
							Required, Partial
							Optional, Complete
							Required, Complete

							Optional, Partial
							Required, Partial
							Optional, Complete
							Required, Complete

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Language Codes

In Natural, each language has a *language code* (from 1 to 60). The table below is an extract from the full table of language codes. For a complete overview, refer to the description of the system variable *LANGUAGE in the *System Variables* documentation.

Language Code	Language	Map Code in Object Names
1	English	1
2	German	2
3	French	3
4	Spanish	4
5	Italian	5
6	Dutch	6
7	Turkish	7
8	Danish	8
9	Norwegian	9
10	Albanian	A
11	Portuguese	B

The language code (left column) is the code that is contained in the system variable *LANGUAGE. This code is used by Natural internally. It is the code you use to define the user language (see *Defining the User Language* below). The code you use to identify the language of a Natural object is the *map code* in the right-hand column of the table.

Example:

The language code for Portuguese is "11". The code you use when cataloging a Portuguese Natural object is "B".

For the full table of language codes, see the system variable *LANGUAGE as described in the *System Variables* documentation.

Defining the Language of a Natural Object

To define the language of a Natural object (map, help routine, program, subprogram or copycode), you add the corresponding map code to the object name. Apart from the map code, the name of the object must be identical for all languages.

In the example below, a map has been created in English and in German. To identify the languages of the maps, the map code that corresponds to the respective language has been included in the map name.

Example of Map Names for a Multilingual Application

DEMO1 = English map (map code 1)

DEMO2 = German map (map code 2)

Defining Languages with Alphabetical Map Codes

Map codes are in the range 1-9, A-Z or a-y. The alphabetical map codes require special handling.

Normally, it is not possible to catalog an object with a lower-case letter in the name - all characters are automatically converted into capitals.

This is however necessary, if for example you wish to define an object for Kanji (Japanese) which has the language code 59 and the map code x.

To catalog such an object, you first set the correct language code (here 59) using the terminal command %L=nn, where nn is the language code.

You then catalog the object using the ampersand (&) character instead of the actual map code in the object name. So to have a Japanese version of the map DEMO, you stow the map under the name DEMO&.

If you now look at the list of Natural objects, you will see that the map is correctly listed as DEMOx.

Objects with language codes 1-9 and upper case A-Z can be cataloged directly without the use of the ampersand (&) notation.

In the example list below, you can see the three maps DEMO1, DEMO2 and DEMOx. To delete the map DEMOx, you use the same method as when creating it, that is, you set the correct language with the terminal command %L=59 and then confirm the deletion with the ampersand (&) notation (DEMO&).

```

08:41:14          ***** NATURAL LIST COMMAND *****          2001-01-25
User SAG          LIST * *          Library SAG

Cmd  Name      Type      S/C  SM  Vers  Level  User-ID  Date      Time
---  -
___  COM3      Program  S/C  S   2.2   0002   SAG      92-01-21  14:34:39
___  CUR        Program  +----- DELETED -----+      92-01-22  09:37:02
___  CURS       Map      !                               !      92-01-22  09:37:41
___  D          Program  ! Please confirm deletion !      92-01-21  14:13:14
___  DARL       Program  ! with name DEMOx             !      91-06-03  12:08:30
___  DARL1     Local    ! DEMO&_____                !      91-06-03  12:03:52
___  DAV        Program  +-----+                      +      92-01-29  09:07:52
de   DEMOx     Map      S/C  S   2.2   0002   SAG      92-02-25  08:41:04
___  DEMO1     Map      S/C  S   2.2   0002   SAG      92-01-22  08:38:32
___  DEMO2     Map      S/C  S   2.2   0002   SAG      92-01-22  08:07:32
___  DOWNCOM   Program  S    S   2.2   0001   SAG      91-08-12  14:01:10
___  DOWNCOMR  Program  S    S   2.2   0001   SAG      91-08-12  14:01:32
___  DOWNCOM2  Program  S    S   2.2   0001   SAG      91-08-15  13:02:20
___  DOWNDIR   Program  S    S   2.2   0001   SAG      91-08-16  08:03:56
From _____ (New start value)          0

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10---PF11---PF12---
      Help      Exit      --      -      +          Canc
    
```

Defining the User Language

You define the language to be used per user - as defined in the system variable `*LANGUAGE` - with the profile parameter `ULANG` (which is described in the *Parameter Reference*) or with the terminal command `%L=nn` (where `nn` is the language code).

Referencing Multilingual Objects

To reference multilingual objects in a program, you use the ampersand (&) character in the name of the object.

The program below uses the maps `DEMO1` and `DEMO2`. The ampersand (&) character at the end of the map name stands for the map code and indicates that the map with the current language as defined in the `*LANGUAGE` system variable is to be used.

```
DEFINE DATA LOCAL
1 PERSONNEL VIEW OF EMPLOYEES
  2 NAME (A20)
  2 PERSONNEL-ID (A8)
1 CAR VIEW OF VEHICLES
  2 REG-NUM (A15)
1 #CODE (N1)
END-DEFINE
*
INPUT USING MAP 'DEMO&' /* <--- INVOKE MAP WITH CURRENT LANGUAGE CODE
...
```

When this program is run, the English map (`DEMO1`) is displayed. This is because the current value of `*LANGUAGE` is `1 = English`.

MAP DEMO1

SAMPLE MAP

Please select a function!

1.) Employee information

2.) Vehicle information

Enter code here: _

In the example below, the language code has been switched to `2 = German` with the terminal command `%L=2`.

When the program is now run, the German map (`DEMO2`) is displayed.

BEISPIEL-MAP

Bitte wählen Sie eine Funktion!

1.) Mitarbeiterdaten

2.) Fahrzeugdaten

Code hier eingeben: _

Programs

For some applications it may be useful to define multilingual programs. For example, a standard invoicing program, might use different subprograms to handle various tax aspects, depending on the country where the invoice is to be written.

Multilingual programs are defined with the same technique as described above for maps.

Error Messages

Using the Natural utility `SYSERR`, you can translate Natural error messages into up to 60 languages, and also define your own error messages.

Which message language a user sees, depends on the `*LANGUAGE` system variable.

For further information on error messages, see *SYSERR Utility* in the *Utilities* documentation.

Edit Masks for Date and Time Fields

The language used for date and time fields defined with edit masks also depends on the system variable `*LANGUAGE`.

For details on edit masks, see the session parameter `EM` as described in the *Parameter Reference*.

Skill-Sensitive User Interfaces

Users with varying levels of skill may wish to have different maps (of varying detail) while using the same application.

If your application is not for international use by users speaking different languages, you can use the techniques for multilingual maps to define maps of varying detail.

For example, you could define language code 1 as corresponding to the skill of the beginner, and language code 2 as corresponding to the skill of the advanced user. This simple but effective technique is illustrated below.

The following map (PERS1) includes instructions for the end user on how to select a function from the menu. The information is very detailed. The name of the map contains the map code 1:

```
MAP PERS1

SAMPLE MAP

Please select a function

1.) Employee information _
2.) Vehicle information _

Enter code: _

To select a function, do one of the following:
- place the cursor on the input field next to desired function and press Enter
- mark the input field next to desired function with an X and press Enter
- enter the desired function code (1 or 2) in the 'Enter code' field and press
Enter
```

The same map, but without the detailed instructions is saved under the same name, but with map code 2.

```
MAP PERS2

SAMPLE MAP

Please select a function

1.) Employee information _
2.) Vehicle information _

Enter code: _
```

In the example above, the map with the detailed instructions is output, if the ULANG profile parameter has the value 1, the map without the instructions if the value is 2. See also the description of the profile parameter ULANG (in the *Parameter Reference*).