Script reference manual

Eye and Pen version 4.0

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MSHS Poitiers

"IF ALL ELSE FAILS, READ THE MANUAL"

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A SCRIPT-BASED ACQUISITION: INTRODUCTION

Sometimes (often), easy to use ("one-click") build-in tools doesn't help to perform an experiment. More flexibility is needed.

The Eye and Pen way is to offer scripting capabilities. Scripting means telling Eye and Pen what it has to do, with commands ("orders"). Yes, this is programming. But with a limited number of words.

Thus: acquisition based on script relies on a mini programming language.

The good news is that every command can be added to script with the help of dialog boxes (assistant) where you just have to set values in fields, or select value in list, etc.. It has a syntax coloring feature.

Script editor usage is described with more details in the User Manual.

This volume will be dealing with commands and their options.

REMINDER: SCRIPT-BASED ACQUISITION DIALOG BOX

(*File/Acquisition/Script* menu)

When launching the script-based acquisition mode, a "start" dialog box is displayed on the screen.

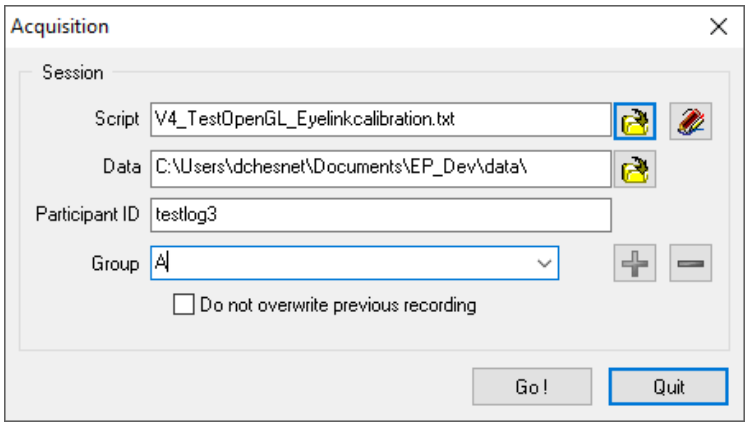


Figure 1: Script-based acquisition dialog box.

Two fields of this dialog box are of particular interest to script:

LABEL	DESCRIPTION
Script	Displays the name of the current script. By default, the last used script is proposed. The button allows you to select the script you want to use. The button Modifies the current script or create a new one in the script editor.
Data	Displays the path to the folder that will receive recordings. By default, this the path selected in *File/Configuration/Script*. The button allows you to select an other folder.
Participant ID	Choose a name for the data file(s).
Group	Optionally, select a group to which the participant belongs to, in the scrolling list. This selection may be later retrieved from a script. This list may be modified by hand.

Do not overwrite previous recording	This option allows you to avoid losing data from a previous recording if you mistakenly choose the same name. If this option is ticked and a data file with the same name already exists in the same directory, a warning will be displayed (recording is canceled).
Go !	Launches acquisition. First, the script is checked against major defects (syntax faults, missing files), then it is executed.
Quit	Closes the acquisition dialog box and returns to the main Eye and Pen screen.

SCRIPT COMMANDS: SOME RULES AND DEFINITION

The pseudo language is made up of a list of **commands.**

These commands have to be written in a **text-only file ".txt**" (Windows ANSI coding).

A set of commands in a text file is called a script.

A script follows a number of rules, listed below.

There must be only one command per line. No spaces (blanks) are allowed inside a command.

In a script, a line may contain three sorts of items:

- a **command**. It tells Eye and Pen to perform some action.
- a **comment**: defined by a semi-colon at the beginning of the line and followed by text (spaces allowed). A comment has no action. It is just text.
- a **label:** defined by "**:**" followed by a single word. It is a location "mark" inside a script.

*Example**:***

```
Command1
; my comment is here   <-- A comment
command2
:Tag1                 <-- A label
Command3
```

Script uses two kinds of commands:

- commands comprising a single word.
  Example: `Command1`
- commands comprising a command word followed by parameters between brackets, separated by a comma.
  *Example**:*** `Command1(parameter1,parameter2)`

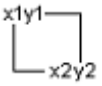
When using the second type of command, replace the parameter definitions (between brackets) with their values.

A few rules:

- A single command, comment or label to a line.
- The script analyzer isn't "case sensitive", i.e. upper- and lower-case letters are the same to it.
- Since comma is used to separate parameters, if you wish to insert a comma into a text, first insert a backslash before the comma ("\,"). This way, it will not be interpreted as a separator.

About coordinates:

X1 and Y1, X2 andY2 are the coordinates of the two opposite corners of a rectangular area (e.g. a screen, a picture, a zone on a tablet, etc.)

LABEL	DESCRIPTION
	X1 and Y1 coordinates correspond to the **upper left-hand corner** of the rectangle. X2 and Y2 coordinates correspond to the **lower right-hand corner** of the rectangle.
X1	Coordinate of the left edge of the rectangle.
Y1	Coordinate of the upper edge of the rectangle.
X2	Coordinate of the right edge of the rectangle
Y2	Coordinate of the bottom edge of the rectangle.

RELATIVE FILE PATHS

In a number of script commands, you will have to mention filenames.
By default, the software will look for pictures in Eye and Pen's "Stimuli" folder (or in the folder you selected in your configuration or redefined through a script command).
However, for reasons of your own, you may want to designate a file that is not in the default folder. There is a solution: the relative path.

An example:

```
SetUnmaskFile(..\cursors\Mask_oval_asym_right170.bmp)
```

Explanation

Folder structure in Windows:

Eye and Pen 4
|-> Stimuli
|-> Cursor

The picture file is located not in the Stimuli folder but in the Cursor folder. Accordingly, the relative path will start from the Stimuli folder:

1. " .. " allows you to move up to the next level in the folder tree, i.e. to leave the "Stimuli" folder and move to the "Eye and Pen" folder.
2. The first " \ " allows you to move down to the "Cursor" subfolder.
3. The next " \ " allows you to designate the picture file contained in the "Cursor" folder.

Relative paths from a default folder can be used anywhere that a file has to be loaded from a default folder.

Note: in this manual, although there is some differences, the terms "folder" and "directory" will be used as if it mean exactly the same thing.

RELEASE NOTES

OpenRec

The OpenRec command underwent a change: file(s) opening and effective recording start were split to get a better measure of reaction time.
The new syntax is OpenRec(filename, Suspended). Suspended should replaced by TRUE or FALSE. To keep portability of Eye and Pen v3 scripts, Suspended is set to TRUE by default if this parameter is omitted.

SetDisplayWindowsCoord

The command SetDisplayWindowsCoord is removed from Eye and Pen 4. Since eytrackers calibration is always done fullscreen, OpenGL requires to be fullscreen to get optimal performance, and we have no kownledge of users finding it useful and using it.

OpenGL

By default, display and graphics rendering in Eye and Pen is performed through GDI (Graphic Device Interface), the basic Windows display system (see https://en.wikipedia.org/wiki/Graphics_Device_Interface for more details).

A major improvement in Eye and Pen 4 scripts is the ability to render display using OpenGL library (https://en.wikipedia.org/wiki/OpenGL). Version 3.3 minimum is required (the ?*/System information* menu will show which version is available on the system).
OpenGL allows to synchronize effective display with monitor refresh. This means that we can have a far better measure of the moment where the graphics card sends the image to the monitor.

OpenGL use is activated within a script with the command ActivateOpenGL(TRUE), and de-activated with ActivateOpenGL(FALSE).

Some scripts functions are not ported to OpenGL, yet:

- AVI video display
- Text display
- Model replay
- screen masking with blur.

OpenGL and eyetracking

If the option to trigger (automatically start) calibration is activated (*Configuration/Eyetracker*), calibration takes place at the very beginning of the acquistion, be it Script or Simple. Calibration is then performed in GDI mode, because OpenGL is not activated.

If calibration should be performed in OpenGL mode, the “trigger calibration” option has to be unactive. Then tick the options “manage calibration screen” and “wait for Esc key to close…” to be able to manage calibration process yourself. Then, in a script, activate OpenGL, next start calibration.

File names case sensitivity

For years, Windows file system has been “case insensitive”. This means that “MyDocument.TXT” and “mydocument.txt” were the same file. This not the case anymore. So be careful when using files within commands: loading “*.BMP” image files will not load “image.bmp” whereas “image.BMP” will be found.

SCRIPT COMMANDS, BY CATEGORY

The script commands are presented and explained below, divided into different function categories.

Files and directories

Redefines the stimuli default directory (pictures, texts, sounds, videos)

SetPicsDirectory(DirectoryPath)

This command redefines the directory of stimuli used in the scripts, initially defined in the "Script" tab of the acquisition configuration panel.

Replace "***DirectoryPath***" with the path to the directory containing your stimuli.

Example

`SetPicsDirectory(c:\myPictures\)` gives the "myPictures" directory on the "C" drive of the PC as the new default stimuli folder.

Redefines the default data files directory

SetDataDirectory(DirectoryPath)

This command redefines the directory in which data files will be recorded (initially defined in the "Script" tab of the acquisition configuration panel).

Replace "***DirectoryPath***" with the path to the directory you want to use.

Example

The command `SetDataDirectory(c:\mydata\)` gives the "mydata" directory on the "C" drive of the PC as the new data recording saving directory.

Redefines the default model files directory

SetModelsDirectory(DirectoryPath)

This command redefines the directory of models files used in the scripts, initially defined in the "Script" tab of the acquisition configuration panel.

Replace "***DirectoryPath***" with the path to the directory containing your models.

Example

The command `SetModelsDirectory(c:\myModels\)` gives the "myModels" directory on the "C" drive of the PC as the new default models directory.

Can a participant's existing data file be overwritten?

SetSafeRec(DontErase)

This command redefines the "*No recording overwrite"* option in the dialog box.

Replace "***DontErase***" by:

- TRUE: no recording allowed if a file already exists.
- FALSE: allow data overwrite if one already exists.

Example

If you insert the command `SetSafeRec(False)` into a script, after this command, there will be no further overwrite checks.
If, a few lines further, you insert the command `SetSafeRec(True)`, **from that line onwards**, data will not be erased and it will be impossible to record them with the same name.

Hint: deactivate this checking for the training trials (to limit the number of useless files) and reactivate it for the following experimental trials.

Opens recording data file(s)

OpenRec(AddToParticipantName, Suspended)

This command opens up to 4 file(s) to record the participant's data: one for the tablet data, and depending on the options choosen in configuration, one for the eye tracker data, one for the audio recording and one for the port data.

The *"**AddToParticipantName**"* parameter allows you to define a suffix that will be added to the data filename (defined in the acquisition start dialog box).
Replace "***Suspended***" by:

- TRUE: no recording will start now.
- FALSE: allow to immediately start recording.

To keep portability with previous version of Eye and Pen scripts, Suspended is set to TRUE by default if this parameter is omitted.

Caution: each file opened with "*OpenRec*" must be closed with "*CloseRec"*.

Hint: to avoid overwriting files if you are using a loop (e.g. when the participant has to perform the same task repeatedly), add "`_%I%`" at the end of *"AddToParticipantName*". This special option will be replaced by the number of times the script has read the last label (for a definition, p. 15).

Example 1

For a participant called "Toto" (you have defined his name in the start dialog box), the command `OpenRec(_series1, FALSE)` will record tablet data in the file named "*toto_series1.tab"*. Recording will start immediately.

Example 2

You have used the command `OpenRec(_series1_%I%)`. Participant Toto has passed the same label in the script twice. You will therefore end up with two recording files: "*toto_series1_1.tab*" and "*toto_series1_2.tab*".

Starts data recording

StartRec

This command starts the effective data recording previously prepared with the `OpenRec` command.

Closes the opened data recording file(s)

CloseRec

This command closes the current participant's recording data file(s) (tablet ".TAB" file and optional eye tracker ".EYE", audio ".WAV", and port ".EXT")

Enable/disable audio data recording

SetAudioRecording(Enable)

If the option "*Record Audio input*" is activated in the *configuration / Audio* menu, this command allows to activate or deactivate audio recording (audio recording is initiated alongside tablet and eyetracker data recording when the OpenRec command is issued).

Replace "***Enable***" by:

- TRUE: an audio recording will take place along with the tablet recording.
- FALSE: no audio recording will be done.

Example

For a participant called "Toto" (you have defined his name in the start dialog box), the command `SetAudioRecording(FALSE)` disables recording of the audio channel from now on.

Log

Logging is a convenient way to store information in memory. When the log is closed, it is written to a text file on disk.
Eye and Pen creates and manages a default log for each recording session (in which each information is tagged with the session timer), which is named from the participant Id.
A custom log may be explicitly created (only one at a time), filled and saved. It is possible to issue successive custom logs.

Add a text to the "default" recording session log

AddToLog(TextMessage)

This command allows to record your own text into the log that Eye and Pen manages during a recording session.

Replace "***TextMessage***" by the text you want to be appended.

Example

If you insert the command `AddToLog(Here we made a pause)` into a script, the sentence "Here we made a pause" will be inserted into the session log file, timestamped with the time elapsed since the beginning of the recording session.

Creates a custom log

OpenMyLog(AddToParticipantName)

This command allows to create your own custom log.

The *"**AddToParticipantName**"* parameter allows you to define a suffix that will be added to the data filename (defined in the acquisition start dialog box).

Example

For a participant called "Toto" (you have defined his name in the start dialog box), the command `OpenMyLog(_series1)` will finally record your own log content in the text file named "*toto_series1.MyLog"*.

If you set a log name that already exists, the log file will be overwritten.

OpenMyLog works like OpenRec: the file will be saved in the data directory.

Calling OpenMyLog when a custom log is already opened immediately closes the current custom log and opens the new one.

Add a text to a custom log

AddToMyLog(TimerMode, TextMessage)

This command allows to add information to your own custom log (for this command to work, the log must have been first created with OpenMyLog).

"***TimerMode***" allows to select a timing source to timestamp the information that will be added to the log. Value can be:

- 0 = no timing
- 1 = current recording timer
- 2 = session timer

Replace "***TextMessage***" by the "sentence" you want to add to your custom log.
For example, this may be an item name, the light detector activation, participant's writing start, etc.

Example: `AddToMyLog(1,item number %I%)`

Saves a custom log to file

CloseMyLog

This command closes the custom log file (previously opened with OpenMyLog) and write its content from memory to a text file.

Creates a text file

CreateTextFile(Filename)

This command opens a text file in which you may add text.

Replace "***Filename***" by the name of the text file your want to open. The file will be named <*Filename*>.TXT and created in the Data folder.
If the file already exists, new information will added at its end, the file not be overwritten.

Add some text to a text file

AddToTextFile(TextMessage)

This command allows to save your own text into a text file (previously opened with OpenTextFile).

Replace "***TextMessage***" by the text you want to be appended. It is immediately written to file.

Please remember that keywords inserted in text are interpreted (replaced by their value), such as participant Id, Group name, Label, etc.
You may use this command to save information created during an experiment, for later re-use, for example.

Close a text file

CloseTextFile

Closes the currently opened text file.

Copy a file to another location

CopyFileTo(Source,Destination)

This command allows to save your own text into a text file (previously opened with OpenTextFile).

Replace "***Source***" by the full path name of the file you wish to copy.

Replace "***Destination***" by the full path name of the file you wish to "receive". The file name may be different from the source, thus allowing to "rename" the file.

Example

`c:\data\toto_capture.jpg` may be copied to `c:\stimuli\pictureA.jpg`

Note

Jokers may be used, such as "`*.*`", "`*.bmp`", etc.

Location-related keywords may also be use (see Keywords, p. 55), such as `%PIMAGES%` (Images directory path).

This command may be use for a range of purposes, including copying a screen capture from the Data to the Stimuli folder, to later re-use it as a screen background, for example.

Defines a label

`:label`

A label identifies a particular place in the script to which you will later refer or for which you will establish a link. Strictly speaking, this is not a command, but a mark in the script. For this reason, each label in the script must be unique.
The “label” notion can be likened to the notion of “bookmark” used in a number of common applications (word processor, etc.) or even with the “anchor” notion used in HTML (Web) documents.
You may see a script as a book that will be read from the first to the last page. A bookmark is a mean to go back to a paticular previous page, when needed. In Eye and Pen script, this bookmark is equiped with a counter that counts how many time you got back to this page. And to more practical, one can reset this counter or give it an arbitrary value.
Different “jump” commands (see below) allow the script to discontinue its sequential execution (one line after the other) and go straight to a particular label and then continue executing commands from this location (see other commands in this section).
When "jumping", commands located between the jump command and the destination label are ignored.

Replace the term “*label”* with a word of your choice.
You may define as many labels as you like.

Notion of “counter”

Each label has an internal counter.
The first time a label is “read” by the script interpreter, it sets the label counter to 1. Each time the interpreter reads this label again (like a command, i.e. the label is on a line of its own) for example, because of a jump command, its counter value is increased by 1 (it will then be set at 2, and the next time at 3, etc.).
A label counter’s value represents the number of iterations (the action of repeating same processes).

Operations

Some specific commands (see below) allow you to explicitly modify a counter’s value. Please remember that performing operations on counter values may lead to negative values, which are not suitable for indexing a list, for example.

Syntax

You can insert spaces in front of the labels or commands (indentation) in order to make your script easier to read.

Example

```
Command1
Command2
    :label
     Command3
     Command4
  etc.
```

Hints:

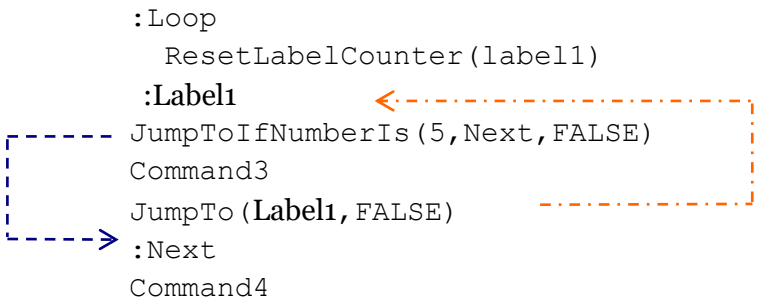
1. a label can be used as a convenient way of memorizing a value while executing a script. In classic programming languages, this is done with a "variable" when the value is likely to change, and with a "constant" when the value will not be modified.
2. to check a label counter's value, you can use the DisplayMsg command. For example, to display the value of the "`Label1`" label counter, you can use `DisplayMsg(Label1 value is: %I:Label1%,2000,-1,-1,TRUE)`

Resets a label counter to zero

`ResetLabelCounter(Label)`

This command allows you to initialize or re-initialize a label's iteration counter.
Replace the word "***Label***" with the name of the label you wish to reset (minus ":").

Example



When the script reaches the command `JumpTo(Label1, FALSE)`, it will jump to the "`:Label1`" label.
At the fifth reading of the command `JumpToIfNumberIs(5,Suite,FALSE)` this command will be "activated". The script will then execute it and jump to the "`:Next`" label. `Command3` and `JumpTo(Label1, FALSE)` will not be executed. The script will continue from the "`:Next`" label, and read and execute `Command4`.

In case `Command4` includes a statement to jump to the "`:Loop`" label, `Label1`'s counter should be reset to allow the script to execute the commands following `JumpToIfNumberIs` a further 4 times.
For example, if we imagine a setup with two zones on the tablet, if the participant presses the pen in the first zone the script continues, whereas if the participant activates the second zone, the script jumps to "`Loop`".

Example of use:

Allows a participant to start a task over again.

Sets the value of a label's counter

`SetLabelCounter(Label,Value)`

This command allows you to define the value of a label's internal counter.

Replace "***Label***" with the name of the label (minus ":") whose counter value is to be modified.

Replace "***Value***" with the number you wish to assign to this label's counter. "*Value*" may also be replaced with another label's counter value (see "Keywords", p. 55).

Example

`SetLabelCounter(Label1,4)` assigns the value 4 to "*`Label1`*"

Note:
`SetLabelCounter(Label1,0)` is equivalent to

```
ResetLabelCounter(Label1)
```

Examples of use

- ❖ When used in conjunction with `JumpToIfNumberIs`, it allows you to change the script blocks that are to be executed, depending on what the participant does;
- ❖ Allows you to start a task again, but with a different number of trials;
- ❖ Allows you to define a loop using only part of a list, for example only using items 8 to 15 (see commands and keywords for handling a list of items).

Adds to the value of a label's counter

AddToLabelCounter(Label,Value)

This command allows you to add a value to the value of a label's internal counter.

Replace "***Label***" with the name of the label (minus ":") whose counter value is to be modified.

Replace "***Value***" with the number you wish to add to this label's counter. "*Value*" can also be replaced with another label's counter value (see "Keywords", p. 55).

Example

```
AddToLabelCounter(Label1,4)
```

Subtracts from the value of a label's counter

SubtractFromLabelCounter(Label,Value)

This command allows you to subtract a value from the value of a label's internal counter.

Replace "***Label***" with the name of the label (minus ":") whose counter value is to be modified.

Replace "***Value***" with the number you wish to subtract from this label's counter. "*Value*" can also be replaced with another label's counter value (see "Keywords", p. 55).

Example

```
SubtractFromLabelCounter(Label1,4)
```

List, items and elements

Using a list of items may help either to simplify the process of writing a script or, conversely, to develop a sophisticated experiment.
An Eye and Pen script automatically has a single list of items.
Each item in the list may be a word, a sentence, a number, a filename, etc. In short, anything that can be written using letters and numbers. Items are numbered from 1. In commands that add some text, such as AddToList, InsertIntoList and AddElement, white spaces before the text are part of it.

Adds an item to the list

AddToList(ItemName)

This command allows you to add an item to the list. This new item is appended to the end of the list. The list is not sorted in any specific way: items appear in the order in which they are added.

Replace "***ItemName***" with the item that is to be added to the list: a string of letters and/or numbers (word, sentence, 500, etc.)

Examples

```
AddToList(This is a sentence to read)
AddToList(1200)
AddToList(image3.wmf)
AddToList(sound.wav)
```

Inserts an item into the list

InsertIntoList(ListIndex, ItemName)

This command allows you to add an item into the list, at a specific position (index).

Replace "***ListIndex***" with the item order number where you want the new item to be inserted.

Replace "***ItemName***" with the item that is to be inserted into the list: a string of letters and/or numbers (word, sentence, 500, etc.)

Examples

```
InsertIntoList(1,This is the new first sentence)
InsertIntoList(5,This is a new item)
InsertIntoList(%LCOUNT%,I am the new last item)
```

Loads an item list from a file

LoadList(FileName)

This command allows you to load a set of items contained in a text file. Its content is then included in the list.
Items are appended to the end of the list. Loading from a file does not delete items previously included in the list.

Replace "***FileName***" with the name of the file to be loaded.

The file must be in a ".TXT" text-only format and should contain one item per line.
The file must be located either in the *Stimuli* folder or else at the end of a relative path leading from this folder (cf. p. 8).

Example:

```
LoadList(liste.txt)
```

Clears the list

ResetList

This command empties the list of its contents: all items are deleted.

Shuffles item order in the list

RandomizeList

This command allows you to shuffle the items around in the list.

Shuffles item order in part of the list

RandomizeListRange(Begin,End)

This command allows you to shuffle items in a random order in just part of the list.

Replace "***Begin***" with the number of the first item in the part of the list that is to be shuffled, i.e.

at the beginning of the set to be randomized.
Replace "***End***" with the number of the last item in the set to be randomized.

Note: position numbering in the list starts with 1.

Example

The command `RandomizeListRange(3,9)` randomizes all items from positions 3 to 9 (inclusive).

Example of use

To be able to use a list of items within a test session divided in sub-blocks, the items in each one being randomized. For example, while the list's first items (practice) are not randomized, two successive blocks of items are randomized, all in a single list. This makes it easier to write a script because the experimental session can simply run from item 1 to the end of the list.

ELEMENTS

An item of the list may be a compound of elements such as words, for example. The following commands aims at allowing to manipulate these elements.

Adds an element to a list item

`AddElement(ListIndex, Element)`

This command allows you to add an element to an item of the list. The element will be appended to the end of the item at position given in the list.

Replace "***ListIndex***" by the order number in the list of the item to modify.

Replace "***Element***" by the alphanumerical string you want to add to the item. If an element contains then # character between "words", they may be later retrieved as separated items.

Examples

```
AddElement(14,4 words as one sentence)
AddElement(46,#pseudoword)
Addelement(7,#probe#target)
```

Splits a text into elements

`GetElements(Text)`

This command allows you to split a text into elements, if they are separated by the # character.

Replace "***Text***" by the sentence you want to split.

Once a sentence has been split into elements, keywords allows to individually access these elements.

`%E<index>%` allows to retrieve the element at position `<Index>` in the text.
For example, `%E32%` retrieves then 32th element of the text processed.

`%ECOUNT%` returns the number of elements that have been split.

Keywords may be mixed as well, using label counter as index, as in `%E:BlocStart%`, for example.

The following example shows how to iterate through a string made of words, using `%ECount%` and `%E<Value>%`, Value being a label counter's value:

```
GetElements(This is # a # string #of text# made #of# elements)
:MyCounter
   DisplayMessage(%E:MyCounter%,-1,-1,-1,FALSE)
   WaitForKeypress
   LoopIfLabelIsBelow(StringPos, %ECount%)
```

ITEMS LIST CONTENT

The commands presented here are devised to help managing the items list by showing its content.

Display the items list content

`ShowItemsList`

This command displays the content of the list. This is a helper to use when setting up a script, to check the content of the items list when performing an "execution test" (see "Script" menu of the Script Editor, in Eye and Pen user manual).

This command has no effect when performing an acquisition.

Save the items list content into a file

`SaveItemsListToTxt(FileName)`

This command writes the items list content into a text file (csv format).

Replace "***FileName***" with the name of the text file.

Note: the file will be saved in the *Data* folder.

Examples

1. the command `SaveItemsListToTxt(List1)` captures the items list content in the file named "List1.*txt*"
2. for a participant named "*Toto*", the command `SaveItemsListToTxt(%S%_List)` will save the items list in a file named "*Toto_Capture.txt*" (the keyword `%S%` is replaced by the participant'sId).

Screen Display

Resolutions and sizes

When using a masking technique, if you intend to use pictures as a background/wallpaper (e.g. using the *DisplayPic* command), we strongly advise that you adjust the screen resolution to match the picture size. For example, if you are using pictures measuring 1024*768, switch the screen resolution to these dimensions (menu ?/System Information, click on "Screen") and display your pictures at coordinates (0,0).
It should be borne in mind that the pen's position on the tablet is mapped onto the display (screen) size. A different frame and coordinate system for the screen may make some of the participant's writing look distorted.
Thus, a screen configured with a 1280*1024 pixel resolution, using a display/writing zone

(*Configuration/Script* menu) of 1024*768 pixels and displaying a centered picture of 800*600 pixels will produce a "shrinking" effect. Obviously, if this what you are aiming for, forget everything that has just been said!

OpenGL support in scripts: to get a better control of visual stimuli display, and hence to measure more acurate reaction times.

Redefines the screen's rendering engine

ActivateOpenGL(Activate)

This command switches display rendering control to OpenGL instead of GDI (more information about this in the release notes of this volume).

Replace "***Active***" with TRUE to activate the display rendering by OpenGL feature and with FALSE to switch it back to GDI.

Example:

```
ActivateOpenGL(TRUE).
```

Redefines the screen's background color

SetBackGroundColor(ColorValue)

This command redefines the screen's background color (initially defined in the "*Script*" tab of the acquisition configuration panel).

Replace "***ColorValue***" with the number of the color you want.
Color numbers follow the Web standard and range from **#000000** (**black**) to **#FFFFFF** (**white**).

Example

As a result of the command `SetBackGroundColor(#000000)`, the screen background color will be black.

Redefines the characteristics of messages or texts displayed on the screen

SetFont(FontName,FontSize,FontColor,BkgndColor)

This command redefines the characteristics of the font and the background of the text displayed on screen (initially defined in the "Script" tab of the acquisition configuration panel).
Replace the parameters (described below) with the appropriate values.

LABEL	DESCRIPTION
FontName	Name of the font used. Respect upper/lowercase letters and spaces in the names.
FontSize	Font size (in points, same unit as in word processors).
FontColor	Font color (color number)
BkgndColor	Background color for text display (color number)

Example

After the command `SetFont(Comic sans MS,14,#000000,#FFFFFF)` has been read by the Eye and Pen script interpreter, the text will be displayed:

- in black (*BkgndColor* = "#000000");
- in the Comic sans MS font (*FontName* = "Comic sans MS");
- in 14 points (*Fontsize* = "14");
- against a white background (*BkgndColor* = "#FFFFFF").

Saves the screen content in an image file

`SaveScreenToBMP(PictureFileName)`

This command converts the screen into a picture file (BMP format).

Replace "***PictureFileName***" with the name of the picture.

Note: the picture is saved in the *Stimuli* folder, thus allowing you to display it again through a script command.

Examples

3. the command `SaveScreenToBmp(Copy1)` captures the screen content in the file named "*Copy1.bmp*"
4. for a participant named "*Toto*", the command `SaveScreenToBmp(%S%_Capture)` will save the screen in a file named "*Toto_Capture.bmp*" (the keyword `%S%` is replaced by the participant'sId).

Saves a screen area content in an image file

`SaveScreenAreaToBMP(PictureFileName, X1, Y1, X2, Y2)`

This command converts the screen into a picture file (BMP format).

Replace "***PictureFileName***" with the name of the picture.

Note: the picture is saved in the *Stimuli* folder, thus allowing you to display it again through a script command.

Replace "***X1***", "***Y1***", "***X2***" and "***Y2***" with the coordinates (in pixels) of the part of the display you want to save.

Example: `SaveScreenAreaToBMP(Capture1,100,100,800,600)`

Captures the screen area from 100 to 800 pixels horizontally, and 100 to 600 pixels vertically, content in the file named "*Capture1.bmp*".

Masking

Masking/unmasking production can take two forms: either the "unmasked area" follows the pen location or it remains at (a) fixed location(s) on the screen that is unmasked when the pen reaches that point. Only one technique can be used at a time. If you define unmasking zones (areas), this mode will always take precedence over the "floating" version.

Designates the file to unmask the display

`SetUnmaskFile(MaskFileName)`

This command allows you to select a picture file that will be used to unmask an area around the

pen location. In other words, this is a "peephole" file that helps writers to "see through" the mask covering the screen display.

An "unmasking" file is a two-color (black and white) BMP format picture, where the white area represents the transparent area. Several samples are provided in the "Cursors" folder (the number included in the filename is the "whole" size, expressed in screen pixels). The file is always centered on the pen tip's location.

Figure: A file used to unmask the display.

Replace "***MaskFileName***" with the filename you wish to use.

Example

The following command identifies the file named "`Oval_asym_right170.bmp`" as the unmasking file: `SetUnmaskFile(..\cursors\Oval_asym_right170.bmp)`

Note:
The picture file is located not in the *Stimuli* folder, but in the *Cursors* folder. This means that a relative path starting from the *Stimuli* folder has to be used (for more information about relative paths, see p. 8).

Defines how the screen will be masked

`SetMaskingMode(Mode)`

This command allows you to determine which kind of mask is to be applied to the screen display, out of a possible 3:

- 1 (COLOR): the display is filled with a uniform color
- 2 (PICTURE): the display is concealed by a picture
- 3 (BLUR): the display content is blurred.

Replace "***Mode***" with the mode number you have selected.

Example: `SetMaskingMode(3)` sets the screen masking mode to "blur"

Note:
If you write your script with the help of the script editor, you will be able to select the mode you require from a scrolling list. Its number will automatically be inserted into the resulting command.

Selects the picture that will mask the display

`SetMaskingFillPic(PictureFileName)`

This command allows you to select the picture file that will cover the screen display (see User manual for a list of supported picture file formats).

Replace "***PicturFileName***" with the picture filename you want.

Example:

```
SetMaskingFillPic(MaskFile.jpg)
```

Selects a color to mask the display content

SetMaskingFillColor(ColorNumber)

This command allows you to select the color that will fill the screen display.

Replace "***ColorNumber***" with the number of the color you have selected.

Note: if you are using the script editor, you will select the color from a color map.

Example

The following command determines the color that is to fill the screen (i.e. orange):
`SetMaskingFillColor(#FF8000)`

Sets blur intensity to mask the display

SetMaskingBlurLevel(Intensity)

This command allows you to adjust the intensity of the blurring that will be applied to the screen content.

Replace "***Intensity***" with the intensity level you have selected (from 1 to 100).

Because the blurring of the trace left by the pen is dynamically calculated, we advise you to choose a value between 3 and 25. Values above 25 considerably increase the calculation time and hence the time needed to refresh the display.

Example

The following command sets the blurring level at 12: `SetMaskingBlurLevel(12)`

Activates/deactivates display masking

ActivateFeedbackMasking(Active)

This command allows you to turn the screen display masking feature on or off for the following commands: `WaitForTabZoneAt`, `WaitForTabZones` and `RecStandard`.

Replace "***Active***" with TRUE to activate the display masking feature and with FALSE to switch it off.

Example:

```
ActivateFeedbackMasking(TRUE)
```

Defines an unmasking zone

DefineUnmaskZone(x,y)

This command allows you to define an unmasking zone, i.e. a fixed location on the screen that will be unmasked when the pen reaches it.

"***X***" and "***Y***" represent the upper left-hand corner of the area that is to be unmasked (in pixels). The horizontal and vertical sizes of the area are implicit; they are those of the unmasking picture.

Zones have an order: they are processed in their order of creation.

Important

If unmasking zones are created, they take over the "free" unmasking mechanism. Thus, the unmasking will not freely follow the pen position but will only be effective in some areas of the screen, i.e. the unmasking zones.

Example

The following command creates an unmasking zone at screen coordinates x=100 and y=236 :

```
DefineUnmaskZone(100,236)
```

Example of use

Create a series of unmasking zones, each one corresponding to a place where the participant is expected to write words. A zone only becomes visible (unmasked) for for the time it takes for a word to be written in it. As soon as the pen leaves the zone, it is masked again.
The following commands allow you to manage and fine tune the zones' behavior.

Deletes all unmasking zones

`ClearUnmaskZones`

This command deletes all the unmasking zones that were previously defined.

Defines neighboring zones that are to be unmasked at the same time

`SetUnmaskZonesRange(LowLimit,HighLimit)`

This command defines the boundaries of the zones that are activated (unmasked) at the same time as the zone under the pen tip.

Replace "***LowLimit***" with the preceding zone's number (in zone creation order, see *DefineUnmaskZone* command) and "***HighLimit***" with the number of the next zone, relative to the active zone.
The active zone (under the pen tip) is always numbered 0.
The zone preceding the active zone (in order of creation) is numbered -1, the one before that is numbered -2, and so on.
Following the same principle, the zone after the active zone is numbered 1.
There is no limit to the number of previous and subsequent zones that can be activated (unmasked) at the same time.

Example

The following command means that each time a zone is unmasked (with the pen), the previous zone (in order of creation) is also unmasked: `SetUnmaskZonesRange(-1,0)`

Note:

The default range is (0,0): only the activated-by-pen zone is unmasked.

Allows you to go back to a previously unmasked zone

`SetUnmaskZonesBackTracking(Allowed)`

This command determines whether or not it is possible to go back, i.e. to unmask a zone that has previously been unmasked (in zone creation order).

Replace "***Allowed***" with TRUE to enable you to go back or with FALSE to disallow it.

Example

In the following example, if the participant unmasks first Zone 1, then Zone 2, he or she cannot then go back to Zone 1 and unmask it again: `SetUnmaskZonesBackTracking(FALSE)`

Note:

The default value is TRUE: it is possible to go back.

Determines whether the pen must be pressed in a zone to unmask it

`MustWriteToActivateUnmaskZone(MustWrite)`

This command allows you to determine whether the participant has to press the pen tip in a zone to unmask it.

This command is specific to zone unmasking.

Replace "***MustWrite***" with TRUE to make the pen pressure mandatory, or with FALSE so that the pen's presence above a zone is enough to unmask it.

Note:

This value is TRUE by default: the pen must be pressed in a zone for the latter to be unmasked.

Example: `MustWriteToActivateUnmaskZone(TRUE)`

Displays an animated drawing/writing

PlayModel(Modelname, PauseBefore, TimeRatio, WithWatermark, IsCentered)

This command allows having a handwriting/drawing sequence replayed from a data file.
This file can be created from Eye and Pen recording and/or modified by hand (see User manual), or even created from a calculation, etc.

This command is **display only**; it is not possible to write at the same time.

LABEL	DESCRIPTION
ModelName	Name of the file (.TXT) that contains the writing:drawing to replay. This file should be found in the *Model* directory (initially defined in the "*Script*" tab of the acquisition configuration panel).
PauseBefore	Duration (in milliseconds) of a pause before beginning the replay. Pen cursor is already displayed at the starting point. Duration has two "magic" values: • 0: make no pause • -2: wait for a key press (instead of time).
TimeRatio	Percentage of the normal speed for replay. 100 means normal speed, less is slow down, more is speed up.
WithWatermark	Should the final product be displayed as a watermark (its color is defined in the configuration panel, *Analysis* tab) ? If yes, replace WithWatermark by TRUE, else set FALSE.
IsCentered	Should the model be centered on screen ? If yes, replace WithWatermark by TRUE, else set FALSE.

Example

```
PlayModel(3copies.txt,2000,50,TRUE,TRUE)
```

Will play "`3copies.txt`" after a 2 second pause, at 50% of normal speed. It will be shown as a watermark (so visible before replay starts) and centered on display.

About Model files

A model file is a text file because it allows building one's tracing at will, either from an Eye and Pen recording (exported to a Model file after filtering and resampling, for example) or event build from multiple tracing as a "mean" tracing.

A "model" file may be modified, provided it is saved as an ANSI text file (MS-DOS like). For example, in Microsoft Excel, you may save as Text (separator: tabulation) (*.txt).

The file content is build as follows:

- ☑ Sampling rate, in Hz (correct values are between 10 and 1000)
  For example: 200.
- ☑ Horizontal and vertical resolution of tablet (typically 1000 or 2000 lines / cm). For example: 2000 2000

- ☑ Coordinates range of the tablet: origin and horizontal and vertical extend.
  For example: 0 0 45630 22480
- ☑ Samples, made of X coordinate, Y coordinate, Pressure value.

Model file content example:

```
200
2000        2000
0           0           44500       22300
0           0           0
11667       20524       190
11682       20548       286
11699       20575       294
11718       20606       349
11737       20639       447
11757       20674       537
...
```

Message

Displays a message for a certain length of time

`DisplayMsg(Message, Duration, X, Y, Transparent)`

This command is used to display a message for a user-defined duration, at the indicated screen coordinates. The script remains "on hold" until the display time has elapsed. The message disappears when the command comes to an end.

To set the content of the message, replace "***Message***" with the text you want to display.

Caution: do not include "**,**" in your message, as it is a parameter separator.

To set the message display duration, replace "***Duration***" with the desired amount of time, expressed in **milliseconds.**

To set the message's position in the display windows, replace "**X**" with the horizontal coordinate (in pixels) of the message's first character and "**Y**" with its vertical coordinate.

To set the message's horizontal and vertical coordinates, you can:

- proceed by trial and error;
- use a relation including the screen's physical size and resolution.

Hint:

- to center the message in one/both dimension(s), set the corresponding coordinate to "-1";
- to leave the message on the screen "forever", set duration to "-1". The script will resume immediately, without erasing the message.

Replace "***Transparent***" with FALSE if you want the message to be displayed on a background stripe colored with the current font background color or with TRUE to have only the characters of the message displayed on the screen.

Note: when transparency is set to TRUE, the display font is always black, this is a known bug of Windows.

Example

With the command `DisplayMsg(Hello world,500,120,600,TRUE),` the message "Hello world" will be displayed for 500 milliseconds.

Erases the message left on the screen

`HideMessage`

This command removes the message previously displayed with DisplayMsg (see above).

Text

Displays a text file for a certain length of time

`DisplayText(TextFileName, Duration)`

This command is used to display the content of a text file for a certain length of time. The script remains until the display time has elapsed. The text disappears when the command comes to an end.

Replace "***TextFileName***" with the name of the **text file** you placed in the stimuli directory. Do not forget to add the ".txt" extension to the filename.

Replace "***Duration*****"** with the **duration** (in milliseconds) of the text display.

Hint: if you want the text to remain "forever" on the screen, set the duration to "-1". The script will immediately resume, without erasing the text.

Example

With the `DisplayText(mytext.txt,500)` command, the text contained in the text file named "*mytext.txt*" (found in the stimuli directory) will be displayed for 500 milliseconds.

Erases the text on screen

`HideText`

This command removes the text displayed on the screen as a result of the "`DisplayText`" command.

Picture

Displays a picture for a certain length of time

`DisplayPic(PictureFileName, Duration, X, Y)`

This command is used to display a picture (found in the stimuli folder) for a certain length of time. The picture stays on the screen until the display time has elapsed. The picture disappears when the command comes to an end.

Replace "***PictureFileName***" with the name of the **picture** (do not forget the format extension). The picture may have been preloaded into memory with the *`PreloadPics`*

command to shorten loading time.

Replace "***Duration***" with **the length of time** (in milliseconds) you want.

To set the picture's position in the display windows, replace "***X***" with the horizontal coordinate (in pixels) and "***Y***" with the vertical ccordinate of the picture's upper left-hand corner.

To set the picture's horizontal and vertical coordinates, you can:

- proceed by trial and error;
- use a relation including the screen's physical size and resolution.

Hint:

- to center the picture in one/both dimension(s), set the corresponding coordinate to "-1".
- to make the picture remain on the screen "forever", set the duration to "-1". The script will resume immediately, without removing the picture.

Example

With the `DisplayPic(icon.bmp,500,120,120)` command, the picture "*icon.bmp*" will be displayed for 500 milliseconds at the coordinates *X=120*, *Y=120*.

Erases the picture on the screen

`HidePicture`

This command removes the picture from the screen (previously displayed using the `DisplayPic, DisplayPicWithSensor` or `DisplayImageList` command). Background is restored.

Displays a series of pictures one after another

`DisplayImageList(ListFileName, X, Y, DurationPerPicture, HideLastPic)`

This command displays pictures one after another (at the specified coordinates) for a specified length of time.

Replace "***ListFileName***" with a text filename (TXT format) containing the picture list (see supported pictures formats in the User manual) to be displayed (one picture name per line). Save this file and the pictures in the stimuli directory.

Caution: all pictures must be the same size. The first picture to be displayed will define the size of all the others.

Example:

The file `MyList.txt` contains:
Eye.bmp
And.bmp
Pen.bmp

To set the picture's position in the display windows, replace "*X*" with the horizontal coordinate (in pixels) of the picture's upper left-hand corner and "*Y*" with its vertical coordinate.

To set the picture's horizontal and vertical coordinates, you can:

- proceed by trial and error;
- use a relation including the screen's physical size and resolution.

Hint: to center the picture in one/both dimension(s), set the corresponding coordinate to "-1".

Replace "***DurationPerPicture"*** with the amount of time (in milliseconds) you want each picture to be displayed for.

Replace "***HideLastPic***" with TRUE to remove the last picture from the screen or FALSE to leave it.

Hint: if you use the same background color for all the pictures, you will reduce the visual transition effect between the pictures.

Example

With the `DisplayImageList(Mylist.txt,120,120,250,FALSE)` command, the pictures listed in the "*mylist.txt*" file will be displayed one after the other. Each picture will be displayed at the coordinates X=120 and Y=120 for 250 milliseconds and the final picture will remain on the screen.

Loads pictures into memory

`PreloadPics(PictureFileName, Feedback)`

This command allows loading an image file (or many image files) into memory, before it is actually used in the experiment, shortening time required to display a picture. This is especially useful when reaction time is important, when events should take place with precise timings or when synchronizing with another device (or software).

Replace "***PictureFileName***" by the name of the **picture** (do not forget the format extension) This file should be found in the *Stimuli* directory (initially defined in the "*Scrip*t" tab of the acquisition configuration panel). The name can a path with jokers (`*`, `?`, etc.), relative to the *Stimuli* folder.For example "`*.BMP`" is used to load all BMP files.

Replace "***Feedback***" by *TRUE* to display the number of pictures while loading into memory. This option is especially useful while creating a script.

Note:

Loading duration and memory consumption can be huge. For example, 312 pictures in a 1024*768 resolution will eat 600Mo of RAM.
Resizing pictures to their useful area may help. The 24 bits format (16 billion colors) is processed more quickly.

Calling `PreloadPics` does not unload previously loaded pictures, but adds new picture to existing ones. So, one can load pictures from different folders, or from different types (BMP, JPG, etc.).

Erases pictures from memory

`UnloadPics`

Unloads pictures (previously loaded with `PreloadPics`) from memory.

Defines the location and area of light sensor on screen

`SetLightSensorPosition(x1, y1, x2, y2)`

This command allows to set the location and area required by a light sensor. This area can be selected with the mouse on the screen, using the script editor Command menu.

Replace "***X1***", "***Y1***", "***X2***" and "***Y2***" with the coordinates (in pixels) of the area of the display covered by the light sensor.

Displays a picture on screen

DisplayPicWithSensor(PictureFileName, Duration, X, Y, Color)

This command works the same as DisplayPic, except that a color patch is displayed at the light sensor location.

This command is used to display a picture for a certain length of time. The picture stays on the screen until the display time has elapsed. The picture disappears when the command comes to an end.

LABEL	DESCRIPTION
PictureFileName	Replace "*PictureFileName*" with the name of the **picture** (do not forget the format extension) This file should be found in the *Stimuli* directory (initially defined in the "*Script*" tab of the acquisition configuration panel).
Duration	Replace "*Duration*" with **the length of time** (in milliseconds) you want.
X, Y	**Sets the picture's position** in the display windows. Replace "*X*" with the horizontal coordinate (in pixels) and "*Y*" with the vertical coordinate of the picture's upper left-hand corner.
Color	Color of the patch that will be displayed at the light sensor location: 0 for black, 1 for white.

Hint:

- to center the picture in one/both dimension(s), set the corresponding coordinate to "-1".
- to make the picture remain on the screen "forever", set the duration to "-1". The script will resume immediately, without removing the picture.

Example

`DisplayPicWithSensor(icon.bmp,500,120,120,1)` command, the picture "*icon.bmp*" will be displayed for 500 milliseconds at the coordinates *X=120*, *Y=120,* with a white patch under the light sensor (then activating it).

Video

Displays a video file

DisplayAVI(VideoFileName, X, Y, Wait)

This command displays a video (found in the stimuli directory) at specified coordinates (relative to the display window). The video disappears when it is finished.

Replace "***VideoFileName***" with the video file's full name (including its "`.AVI`" extension).

Caution:

Eye and Pen can only read ".avi" video format, preferably with MS-RLE compression. To check whether the video file complies:

- In Windows, select the video file and, with a right mouse button click, select the Summary tab in Properties;

- Look in "*Video*" for the "*Compression*" label to check the video's compression mode. It should be either "none" or "MS-RLE".

To set the video's position in the display windows, replace "***X***" with the horizontal coordinate (in pixels) of the video's upper left-hand corner and "***Y***" with its vertical coordinate.

To set the video's horizontal and vertical coordinates, you can:

- proceed by trial and error;
- use a relation including the screen's physical size and resolution.

Hint:

To center the video in one/both dimension(s), set the corresponding coordinate to "-1".

The "***Wait***" parameter determines whether the script should wait for the video to finish before continuing or not. This parameter can be given two values:

- "FALSE": the video starts to play and the script immediately resumes;
- "*TRUE*": the film starts and the script goes on hold. No script commands are executed while the video is being played.

Example

With the command `DisplayAVI(MyVideo.avi,-1-1,TRUE,)` the "*Myvideo.avi*" video is played in the center of the display window, because "*X*" and "*Y*" both have a "-1" value. The script resumes as soon as the video is finished.

Stops the video playing

`StopAVI`

This command stops the AVI video currently being played.

Audio

Plays a beep

`Beep`

This command plays the Windows basic sound defined in the Windows Control Panel ("Sounds and audio devices", "Sounds" tab), "default beep" entry.

Makes the system generate a beep

`SystemBeep(Frequency, Duration)`

This command makes the system generate a beep of the frequency and duration you want.

Replace "***Frequency***" with the frequency value of your choice (in Hz) and "***Duration***" with the required duration (in milliseconds).

Caution: this beep is played on through the computer's internal speaker; it uses neither the sound card nor the audio, headset or speaker output of the sound device (card).

Example

The command `SystemBeep(1000,200)` plays a continuous 1,000 Hz frequency sound for 200 milliseconds.

Plays an audio file

PlaySound(WaveFileName, Wait)

This command plays an audio file (found in the stimuli directory) in ".wav" format.
Replace "***WaveFileName***" with the filename (do not forget to add ".wav" to the name).
The "***Wait***" parameter determines whether the sound is to be played as a background task or not.
This parameter can be given two values:

- "FALSE": playing begins and the script resumes immediately;
- "*TRUE*": playing begins and the script goes on hold. No other script command is executed until the audio sequence has finished.

Caution:

If you use this command twice (with no other command between the two), a "system" malfunction may occur.
This is because "Eye and Pen" uses a media player which takes some time to close, before being able to reopen with another file. It is therefore advisable to create a single sound file containing several sound sequences (e.g. as a series of numbers).

Example

The command `PlaySound(ding.wav,FALSE)` plays the "*ding.wav*" sound file and the script continues (the "*Wait*" parameter is "*FALSE*"). The script's next command is immediately executed.

Example of use: a dictation.

Stops the audio play

StopSound

This command stops the audio file currently being played.

Changes the sound output level

SetVolume(value)

This command allows you to change the sound level for the audio output.

Replace "***value***" with a number between 0 (mute) and 65535 (maximum) to set the sound level.

Wait

Pauses the script for a certain duration

WaitFor(duration)

This command stops the script execution for "***duration***" milliseconds.
When the delay is elapsed, the script execution goes on again.

Example

The command `WaitFor(2000)` stops the script for 2000 milliseconds, i.e. 2 seconds. When this delay ends, the script continues.

Stops the script. It starts again when a keyboard key is pressed

`WaitForKeyPress(keyname)`

This command puts the script on hold. As soon as the key is pressed, the script execution resumes. Replace "***keyname***" with the name of a keyboard key (see list in appendix), or live it empty to allow any key.

Pauses the script for a certain duration, displaying a countdown

`CountDown(Duration)`

This command stops the script execution for "***Duration***" seconds. A count down is displayed at the center of the display area.
When the delay is elapsed, the script execution goes on again.

Jumps

The mechanism of **jumping into/through the script** allows you to overcome the sequential aspect of the script (one command after another, in the right order) and create, for example, loops (repeating the same action) or interactive sequences.
This enables a participant to repeat the same task many times (with a maximum number) or to carry out different tasks, depending on the zone (area used as "buttons") in which the pen is pressed.

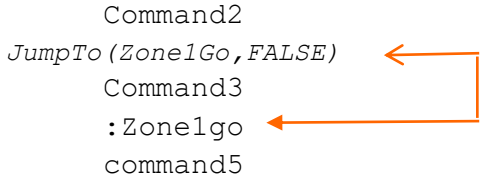
Jumps to a label in the script

`JumpTo(Label, MustCloseRec)`

This command "jumps" to the relevant label (see definition p. 15)and, if specified in the parameters, closes the recording file.
All commands between this command and the relevant label will be ignored and the script will resume after the label.

Replace **"*label*"** with the name of the label you want the script to jump to (minus ":").
Replace **"*MustCloseRec*"** with **"**TRUE", if you want to close an open data recording file, or "FALSE" if you do not need to.

Example



When the script interpreter reads the command `JumpTo(Zone1Go,FALSE)`, it will jump to "*Zone1go*". Commands between `JumpTo(Zone1Go,FALSE)` and the destination label will not be executed (`command3`). The script will continue and execute `command4`. If the "MustCloseRec" parameter had been given the "TRUE" value, the participant's recording file would have been closed.

This command is mostly useful when used in conjunction with conditional jump commands (a jump is made if a condition is met, e.g. when the pen is pressed in a particular area of the tablet).

Jumps to a label in the script

JumpToIfKeyPressedIs(Label, Key, MustCloseRec)

This command "jumps" to the relevant label (see definition p. 15) if the last keyboard key pressed was the one specified in the parameters ("Key"). If this condition is met, and if specified in the parameters, the recording file is closed.

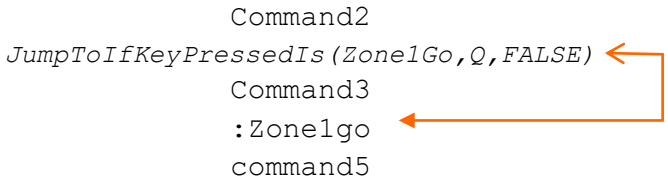
All commands between this command and the relevant label will be ignored and the script will resume after the label.

Replace ***"label"*** with the name of the label you want the script to jump to (minus ":").

Replace "***Key***" with the keyboard key value you want. Please note that this value is case insensitive ("q" will be treated as "Q").

Replace ***"MustCloseRec"*** with "TRUE", if you want to close an open data recording file, or "FALSE" if you do not need to.

Example



When the script interpreter reads JumpToIfKeyPressedIs(Zone1Go,Q,FALSE), it will check if the last keyboard caracter typed is "Q". If this is the case, it will jump to "*Zone1go*". Commands between JumpToIf[...] and the destination label will not be executed (command3). The script will continue and execute command4. If the "MustCloseRec" parameter had been given the "TRUE" value, the participant's recording file would have been closed.

If the last key pressed is not "Q", the script will execute the next command (Command3).

Jumps to a label in the script if a text matches another text

JumpToIfTextIs(Label, Text1, Text2, MustCloseRec)

This command "jumps" to the relevant label (see definition p. 15) if the texts to compare (Text1 and Text2) specified in the parameters are the same. If this condition is met, and if specified in the parameters, the recording file is closed.

All commands between this command and the relevant label will be ignored and the script will resume after jumping to the the label.

Replace ***"label"*** with the name of the label you want the script to jump to (without ":").

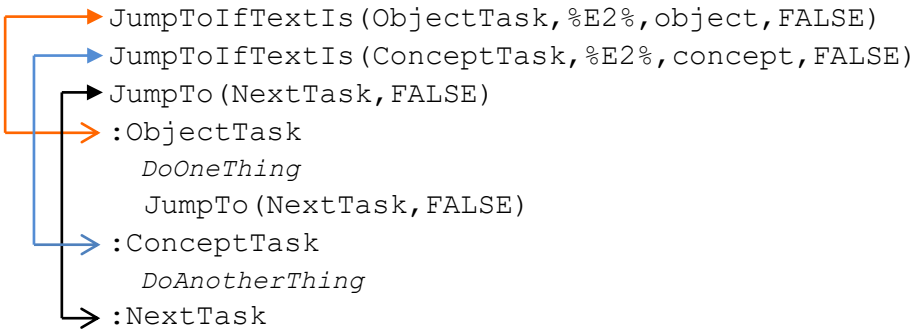
Replace ***"Text1"*** with the first "sentence" to compare and "***Text2***" with the second. Please note that the matching is case sensitive: "sentence" and "Sentence" are not the same.

Replace ***"MustCloseRec"*** with "TRUE", if you want to close an open data recording file, or "FALSE" if you do not need to.
This command can be powerful, for example when one need to compare the content of a list item, or an element of a list item to a specific value.

Example of use: to present a randomized list of stimuli with a specific task to perform, based on stimulus category. We will load stimuli in the list (see List, p.17), where each item (line) is made of a stimulus word and an additional word to specify its category.
For example:

```
table#object
kindness#concept
[...]
```

Then, when processing the list of items, we will split each item into Elements with the command `GetElements(%L%)` (see Elements, p.19). Then, we will trigger a jump into the script, based on the second element (our "category"), retrieved with the keyword "`%E2%`" (see Keywords, p.55):



Let's read these lines.

In the first line, the content of the second element will be compared with the word `object`. If it is the same, the script interpreter will jump to the label `ObjectTask` (red arrow). If not, the script interpreter will evaluate the next line and compare the second element with the word `concept`. If they match, if will jumpt to the label `ConceptTask` (blue arrow). If not, it will evaluate the next line, which instructs to jump to the label `NextTtask` (black arrow).
Note: we inserted a `JumpTo(NextTask, FALSE)` command after *DoOneThing*, because we do not want the `ConceptTask` and following commands to be executed.

Jumps to a label in the script, based on participant's group name

`JumpToIfGroupIs(Label, GroupName, MustCloseRec)`

This command "jumps" to the relevant label (see definition p. 15) if the participant's group name (selected in the script panel) and the name specified in the parameters (`GroupName`) are the same. If this condition is met, and if specified in the parameters, the recording file is closed.

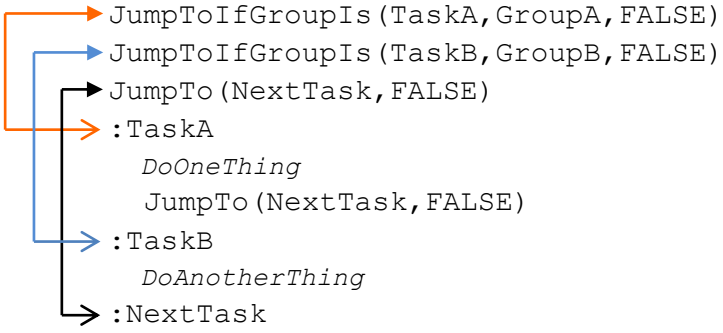
All commands between this command and the relevant label will be ignored and the script will resume after the label.

Replace ***"label"*** with the name of the label you want the script to jump to (minus ":").

Replace ***"GroupName"*** with the name of the group to compare to. Please note that the matching is case sensitive: "group a" and "Group A" are not the same.

Replace ***"MustCloseRec"*** with "TRUE", if you want to close an open data recording file, or "FALSE" if you do not need to.

Example of use: to have particpants perform a specific task, based on their group name.



Let's read these lines.
In the first line, the participant's group name will be compared with the word "`GroupA`". If it is the same, the script interpreter will jump to the label `TaskA` (red arrow). If not, the script interpreter will evaluate the next line and compare the participant's group name with the word "`GroupB`". If they match, if will jumpt to the label `TaskB` (blue arrow). If not, it will evaluate the next line, which instructs to jump to the label `NextTtask` (black arrow).

Note: we inserted a `JumpTo(NextTask, FALSE)` command after *`DoOneThing`*, because we do not want the `TaskB` and following commands to be executed.

Jumps to a "target" label when the script has passed the last label (preceding the command) a certain number of times

`JumpToIfNumberIs(Iterations, Label, MustCloseRec)`

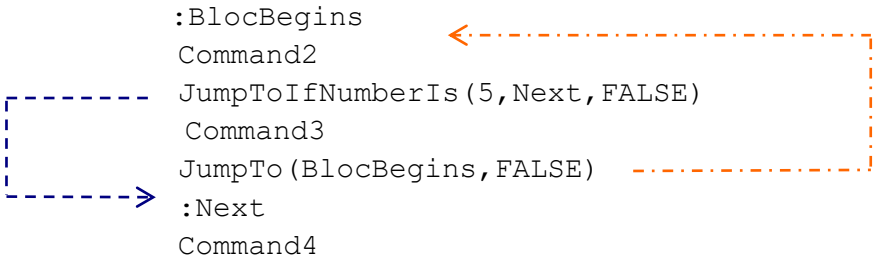
This command is only executed if the script has passed the label in front of (above) the command a certain number of times. If this is the case, the jump will be executed to the relevant label.

Replace "***Iterations***" with the maximum number of times the script can "see" the preceding label before executing the jump.

Replace "***Label***" with the name of the label to jump to (minus ":").

Replace "***MustCloseRec***" (close an open recording data file or leave it open) with **"**TRUE" to activate this parameter or "FALSE" to ignore it.

Example



When the script reaches the `JumpTo(BlocBegins,FALSE)` command, it jumps to the "`:BlocBegins`" label. The `JumpToIfNumberIs(5,Next,FALSE)` command is activated after its fifth "reading". The command is then executed and the script jumps to the ":Next" label. Command3 and `JumpTo(BeginningOfBloc, FALSE)` are ignored and not executed. The script resumes from the "`:Next`" label, reads command4 and executes it.

Examples of use

1 – Making a participant repeat a task several times.

2 – Used in conjunction with other commands, allowing a participant to repeat a task a maximum number of times, without any obligation to reach this maximum.

By the end, `Command2` will have been executed 5 times, whereas `Command3` will have been executed 4 times.

Jumps to a "target" label when a given label's counter reaches a given value

`JumpToIfLabelIs(DestinationLabel,LabelToCheck, Iterations, MustCloseRec)`

This command is only executed if the designated label "to watch" has been read a certain number of times (if its counter reaches a predetermined value).
The script execution then "jumps" to the "target" label's location in the script.

Replace "***DestinationLabel***" with the name of the label to jump to (minus ":").

Replace "***LabelToCheck***" with the name of the label (minus ":") whose counter is to be checked against a predetermined value.

Replace "***Iterations***" with the value to "look for".

Replace "***MustCloseRec***" (close an open recording data file or leave it open) with **"**TRUE" to activate this parameter or "FALSE" to ignore it.

Note

This command is similar to the `JumpToIfNumberIs` command, except that instead of implicitly using the current label's (last "seen" label's) counter value, a label name is explicitly given to serve as a criterion. It is possible to monitor the value of any label defined anywhere in a script.

Jumps to a "target" label if its counter value is below a certain value

`LoopIfLabelIsBelow(Label, Iterations, MustCloseRec)`

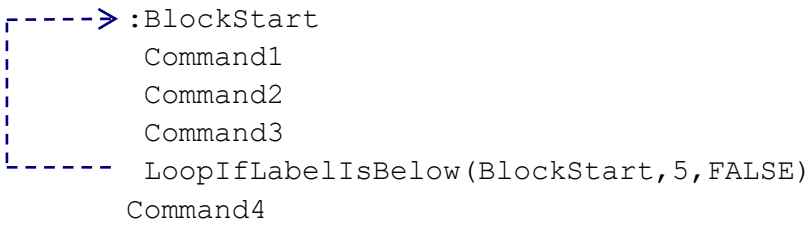
This command is executed if the "watched" label's counter value is below the value specified in the command parameters.
This command allows you to jump to the "watched" label.

Replace "***Label***" with the name of the label to "watch" (minus "**:**") and to jump to when needed.
Replace "***Iterations***" with the threshold value.
Replace "***MustCloseRec***" (close an open recording data file or leave it open) with **"**TRUE" to activate this parameter or "FALSE" to ignore it.

Use

The basic function of this command is to allow you to perform loops, i.e. a block of actions you want to have performed a certain number of times.

Example



When the script interpreter reads the command `LoopIfLabelIsBelow(BlockStart,5,FALSE)`, it checks the value of the internal counter of the "BlockStart" label. If this value is below 5, it jumps to the "BlockStart" label; otherwise it goes on to execute the next command `Command4`.

Example of use

Make a participant perform the same task more than once.

Notes

- When the script interpreter "reads" the "`BlockStart`" label for the first time, its internal counter is set at 1.
- You can modify a label's counter value with the help of the `SetLabelCounter` command .

Jumps in the script triggered by a tablet zone

A tablet zone is an area of the tablet that will be used as a button to trigger an action.

Associates a label with a tablet zone

DefineTabZone(X1, Y1, X2, Y2, Label)

This command allows you to "bind" the indicated label to a tablet area. When the participant presses the pen into the defined tablet are, the script jumps to the label location (in script).

To define the tablet zone, replace *"**X1**", "**Y1**", "**X2**" and "**Y2**"* with the area's coordinates on the tablet.

Replace "***label***" with a word of your choice.

Reminder: the coordinates are defined in tablet units.

Example

```
DefineTabZone(7327,5015,1850,2415,Zone1Go)
Command3
Command4
:Zone1Go
command5
```

`DefineTabZone(7327,5015,1850,2415,Zone1Go)` defines a tablet zone with coordinates *X1= 7327*, *Y1= 5015*, *X2=1850* and *Y2=2415*, bound to the "`:Zone1Go`" label.

You can use this command several times to create several zones that will be used at the same time.
This way, you create a "multiple choice" situation.

Zones will be checked in their order of creation. This means that you can create one zone inside another, by creating the smaller zone first, then creating a larger one to encompass it. When the pen is pressed in the smaller zone, it will be recognized as an activation of the smaller zone, not the larger one.

You can create multiple zones aiming towards the same label.

Jumps to a label depending on the selected tablet zone

WaitForTabZones(CanDraw, MustLeave, MustCloseRec)

This command stops the script until the participant has pressed the pen in one of the zones previously defined using the `DefineTabZone(X1,Y1,X2,Y2,Label)` command (see previous command description).

The **parameters** can be given two values :

- "TRUE": activates the parameter;
- "FALSE": deactivates the parameter.

The table below explains these parameters, assuming a "TRUE" value.

LABEL	DESCRIPTION
CanDraw	The participant's writing (drawing) is reproduced on the screen until the pen is pressed in one of the zones the script is waiting for.

MustLeave	The pen must "quit" the zone before the script can continue.
MustCloseRec	Closes the current data recording file.

Example

```
Command2
DefineTabZone(7327,5015,1850,2415,Zone1Go)
Command3
WaitForTabZones(TRUE,FALSE,TRUE,FALSE)
Command4
:Zone1go
command5
```

The ":Zone1Go" label *is bound* to a tablet zone by the command `DefineTabZone(7327,5015,1850,2415,Zone1Go).`

The script executes Command3 and goes on hold, with the command `WaitForTabZones(TRUE,FALSE,TRUE,FALSE).`

As the `Candraw` parameter is "TRUE", the participant's writing is shown on the screen until the command comes to an end, i.e. when the participant presses the pen in the defined tablet zone.

As the `MustLeave` parameter is "TRUE", the command will only come to an end when the pen leaves the tablet zone.

The script will then "jump" to the "`:zone1Go`" label.

The script will continue and execute `Command5`.

In this example, you can see that `command4` will never be executed.

Waits for the pen to leave the active zone

`WaitForPenOut(MaxStimulusDisplay, StimulusType)`

This command halts script execution until the participant has removed the pen from the zone it is being pressed in. Command parameters allow you to specify a maximum display duration for a stimulus type.

When used jointly with `WaitForTabZones`, this command allows you to manage the start and end of a stimulus after a given length of time (or earlier, depending on the participant's behavior).

Example

With the command `WaitForPenOut(3000,'IMAGE'),` each image-type stimulus will be erased from the screen after 3 seconds (3000 milliseconds), or earlier if the participant removes the pen from the zone before the 3 seconds are up.
Script execution will resume as soon as the participant has removed the pen from the zone.

Stimulus type are:

- IMAGE
- TEXT (text file)
- MESSAGE
- VIDEO
- AUDIO
- ALL: every stimulus type (listed above). If several stimuli are simultaneously played (e.g. a picture and a sound), both will be stopped.

The duration may be set to **-1**. Then only removing the pen from the zone will trigger the action. Duration will not be taken into account.

Example of use in a script:

```
; define a tablet zone to trigger the display of a picture
DefineTabZone(1,1,120,120,zone_image_1)

; define a zone to end the script
DefineTabZone(1,200,120,320,zone_end)

; jump into the "loop"
jumpto(WaitForTabzonesAnchor)

; label for "image 1" zone
:zone_image_1

; display picture image1.bmp for an unlimited duration (-1)
DisplayPic(image1.bmp,-1,0,0)

; wait for the pen to be removed from the zone. Clear the picture when the pen is removed or after 3 seconds, if the pen has not been removed.
WaitForPenOut(3000,IMAGE)

; label for the "loop"
:WaitForTabzonesAnchor

; wait for the pen to be pressed in a zone. Parameters activated: writing on the screen. If the participant selects a zone intended for script, do not wait for the pen to be removed.
WaitForTabZones(TRUE,FALSE,FALSE)

; label for "end"
:zone_end

; wait for the pen to be removed to stop all stimuli. If after 2 seconds then the pen has not been removed, stop all stimuli anyway.
WaitForPenOut(2000,ALL)
```

With this script, the participant has to write (the pen's trace will appear on screen) and he or she can do so in two zones, each associated with an action:

- a zone linked to the label "`zone_image_1`" where the picture `image1.bmp` appears when the participant presses the pen and disappears after 3 seconds, unless the participant removes the pen beforehand (in which case the picture is immediately cleared);
- a zone linked to the "`zone_end`" that stops all stimuli after 2 seconds, unless the participant removes the pen beforehand. The script then ends because there are no more commands.

Clears previously defined tablet zones (defined by "*DefineTabZones*")

ClearZones

This command erases all tablet zones previously defined using the "`DefineTabZone`" command.

Eye tracker

Redefines the calibration area coordinates on the screen

SetCalibrationCoord(X1, Y1, X2, Y2)

This command redefines the calibration area coordinates on the screen (initially defined in the "Eye tracker" tab of the configuration panel).

Replace *"X1", "Y1", "X2" and "Y2"* with the calibration area coordinates (in pixels) you have chosen (see p. 8).

Example

`SetCalibrationCoord(0,0,1024,768)` defines a calibration area that is 1024 pixels wide (horizontally) and 768 pixels high (vertically), beginning in the screen's upper left-hand corner.

Hint: If you are using two 1024*768 resolution screens, the `SetCalibrationCoord(1024,0,2048,768)` command will locate the calibration area on the second (screen) monitor.

Launches the calibration procedure

TestCalibration

This command launches the calibration procedure for the selected eye tracker;
For Eyelink, the calibration procedure is supplied by the eye tracker interface.

Tests calibration reliability

TestDrift

This command launches a test to assess eye tracker coordinate drift.

For Eyelink, the test is run with a single (central) point, whereas with ASL504, the entire calibration procedure is repeated.

Writing display

Warning

The script commands presented below allow you to manipulate the way in which the pen's trace is displayed on the screen. Bear in mind that using more than one of these "special effects" at the same time may produce some surprising results. Please also remember that the behaviour of the masking/unmasking commands (see the Masking section) is linked to the pen tip's position on the screen.

Redefines the color of the trace left by the pen on the screen

SetPenColor(ColorValue)

This command redefines the "ink" color of the pen when tracing is reproduced on the screen (initially defined in the "Display" section of the configuration panel).

Color numbers follow the web standard and range from **#000000** (black) to **#FFFFFF** (white).

Example: after the command `SetPenColor(#000000)`, the pen will write in black.

Redefines the size of the trace left by the pen on the screen

`SetPenWidth(WidthValue)`

This command redefines the thickness of the pen when tracing is reproduced on the screen (initially defined in the "Display" tab of the configuration panel).

Replace "***WidthValue***" with the new line thickness value, expressed in pixels.

Example: `SetPenWidth(2)`.

Time shift writing display

Sets the delay for the pen trace's display on the screen

`SetTabTimeShiftDelay(Duration)`

This command determines the time it takes for the pen's trace to appear on the screen.

Replace "***Duration***" with the delay value (in milliseconds) you require.

Example

The following command delays the pen trace display on the screen by 300 milliseconds:
`SetTabTimeShiftDelay(300)`

Activates/deactivates the delayed display of the pen's trace on the screen

`ActivateTabTimeShift(Active)`

This command allows you to activate or deactivate the delay in displaying the pen's trace on the screen. This function is associated with the following commands: `WaitForTabZoneAt`, `WaitForTabZones` and `RecStandard`.

Replace "***Active***" with TRUE to activate the delay and with FALSE to deactivate.

Example

The following command activates the delayed display of the pen's trace on the screen:
`ActivateTabTimeShift(TRUE)`

Transform writing display

The commands in this section allows manipulating the visualisation (feedback) of writing/drawing, in time and space. An example of such alteration can be found in Marquardt, Gentz & Mai (1999), where the authors enlarged or shrunk the size of handwriting display on a screen.
A handy way to help later analysis, especially if eye movements are recorded, is to capture of the participant's final product (for example using the `SaveScreenToBmp` script command) and use this picture a background in the Eye and Pen analysis.

Shifts writing display on screen

`SetTabOffset(x, y)`

This command allows you to change the reference location for the display of the pen's trace on the screen. This function is associated with the following commands: `WaitForTabZoneAt`, `WaitForTabZones` and `RecStandard`.

Replace "***X***" with the horizontal offset value (in pixels) you want. A positive value shifts to the right, whereas a negative value shifts to the left.

Replace "***Y***" with the vertical offset (in pixels) you require. A positive value shifts toward the bottom, whereas a negative value shifts toward the top.

Example

The following command moves the display of writing up by 50 pixels, relative to the location where it would normally be displayed:

```
SetTabOffset (0,-50)
```

To revert to a "normal" display: `SetTabOffset(0,0)`.

Changes the writing's display proportions on screen

`SetTabRatio(Xratio, Yratio)`

This command allows you to modify the relationship between the pen movements on the tablet and the way they are displayed on the screen. As such, it allows you to enlarge or shrink the pen trace display on the screen.
"***Xratio***" and "***Yratio***" are expressed as a percentage of the normal ratio. Thus, a value between 1 and 99 will shrink the trace size, a value of 100 will not change anything and a value above 100 will enlarge the writing display.
This function is associated with the following commands: `WaitForTabZoneAt`, `WaitForTabZones` and `RecStandard`.

Replace "***Xratio***" with the horizontal modification factor value you want and "***Yratio***" with the vertical modification percentage that is needed.

Example

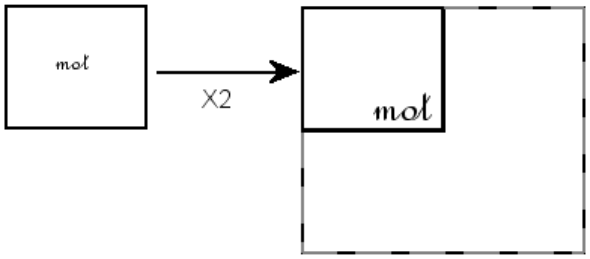
The following command displays the writing trace at 90% of its normal size, both horizontally and vertically:

```
SetTabRatio(90,90)
```

To revert to the "normal" display: `SetTabRatio(100,100)`.

Note

Since modifying the display proportions affects the display surface area (virtual) but not the screen size (physical), enlarging the writing gives the impression that the writing has shifted to the bottom right-hand corner of the screen, whereas shrinking the writing will "shift" it to the top left-hand corner. For example, if the size of the writing is doubled with `SetTabRatio(200,200)`, the point that should have been displayed at screen coordinates (20,20) will be displayed at coordinates (40,40). Think of it as though the size of the display had been doubled but only the upper left-hand quarter was still visible on the screen, because the screen's size cannot be doubled as well.



Write until...

Stops the script and waits for the participant to press the pen in a defined tablet area (Zone)

`WaitForTabZoneAt(x1, y1, x2, y2, CanDraw, MustLeave)`

This command stops the script until the participant presses the pen in the tablet area defined in this command. If the parameter "***CanDraw***" is activated, the participant's writing is displayed on screen. This command is thus a mean to have a participant write (draw) on the tablet whilst displaying his or her writing's trace on screen until he or she presses the pen in a defined area (zone).

To define the tablet zone (area), replace *"***X1***", "***Y1***", "***X2***" and "***Y2***"* with the coordinates (in tablet units, i.e. lines) of the area you have chosen.

- With the 4 coordinates set to **0**, the pen may be pressed anywhere on the tablet to "resume " the script.
- With the 4 coordinates set to **-1**, it is the **start zone** coordinates which are used (defined in the "Script" tab of the acquisition configuration panel)

The other parameters can be given two values :

- "TRUE": activates the parameter;
- "FALSE": deactivates the parameter.

The table below explains these parameters, assuming a "TRUE" value.

LABEL	DESCRIPTION
CanDraw	The participant's writing is reproduced on the screen, until the pen is pressed in the zone.
MustLeave	The pen must leave the zone before the script can continue.

Example

`WaitForTabZoneAt(17327,2415,19850,5015,FALSE,TRUE)` stops the script. No writing wille be displayed. When the participant presses the pen in the defined tablet area (coordinates X1=*17327*, Y1=*2415*, X2=*19850*, Y2=*5015),* then lift it up, the script resumes.

Stops the script and waits for the participant to press a keyboard key

`WriteUntilKeypress`(CanDraw)

This command stops script execution until a keyboard key is pressed, but meanwhile, the participant's writing can be displayed on screen.

Replace "***CanDraw***" with TRUE to show writing on the screen and with FALSE to disable it.

Sets a maximum time for production

`MaxWritingDuration(MaxDuration)`

This command does not suspend script execution, but does set the maximum time (in milliseconds) during which the participant can write (for commands `WaitForTabZoneAt`, `WaitForTabZones`, `WriteUntilKeypress` and `RecStandard`).

Replace `MaxDuration` with a duration expressed in milliseconds.

Example

The command `MaxWritingDuration(360000)` limits the duration to 6 minutes (i.e. 6*60*1,000). If the participant has not pressed the pen in one of the defined zones (or end zone for `RecStandard`) by the time this period has elapsed, the command terminates "on its own" and script execution continues.

Special value: -1 (unlimited duration). This is the default value when no value has been explicitly defined. You may set this value to cancel a previous time limitation.

Using the "Simple" acquisition mode

The commands described below are intended to give you the ability to use the "Simple" acquisition mode ("Simple" tab of configuration panel), allowing you to change some or all of its parameters. You will then be able to record more than one task using this paradigm, for instance, with different pictures each time. Then again, you could use this task without any modification, but in the middle of a set of other tasks.

Launches the Simple acquisition paradigm

`RecStandard(AddToParticipantName)`

The `RecStandard` command allows you to activate the simple acquisition paradigm, with the parameters defined in the configuration panel (Simple tab) of Eye and Pen. Replace "**AddToParticipantName"** with a suffix that will be added to the recording file's name.

> **Caution**: this command manages the opening and closing of the recording data files. This means that you do not have to use `OpenRec` and `CloseRec`.

Example: for the participant "Toto", the command `RecStandard(_standard)` launches the Simple acquisition (as if you had launched it yourself, using the File/Acquisition/Simple menu of

---

Eye and Pen). The tablet data will be saved in "*toto_standard.tab"* and the eye-tracking data in "*toto_standard.eye*".

Launches the Simple acquisition, changing background picture and trigger zone use

RecNewUsages(AddToParticipantName, UseBack, UseZone1, ShowOnStart, HideOnPress, UseZone2)

This command allows you to launch the Simple acquisition, redefining the activation of the background picture and trigger zones 1 and 2. These uses were initially defined in the configuration panel (Simple section).

> **Caution**: this command manages the opening and closing of the recording data files. This means that you do not have to use `OpenRec` and `CloseRec`.

Replace *"AddToParticipantName"* with a suffix that will be added to the recording file's name.

Parameters can be given two values:

- "TRUE": activates the parameter;
- "FALSE": deactivates the parameter.

The following table describes the parameters, assuming a "TRUE" value.

PARAMETER	DESCRIPTION
UseBack	Use a background picture.
UseZone1	Use trigger zone 1.
ShowOnStart	Show the picture associated with trigger zone 1 as soon as recording starts.
HideOnPress	Hide the picture associated with trigger zone 1 as soon as the participant presses the pen on the tablet. **Caution**: this parameter will only be taken into account if "*ShowOnStart*" is activated.
UseZone2	Use trigger zone 2.

Example

With the participant "*Toto*", the command
`RecNewUsages(_P3,FALSE,TRUE,FALSE,FALSE,FALSE)`*:*

- saves data under the name "*toto_P3*";
- there will not be any background picture ("*UseBack*" is "*FALSE*");
- trigger zone 1 will be used *("UseZone1"*= "TRUE");
- the associated picture will not be displayed *("ShowOnStart*" is "FALSE" and so "*HideOnPress*" will be ignored);
- trigger zone 2 will not be used *("UseZone2*" is "*FALSE*").

Launches the Simple acquisition, changing pictures

RecNewPics(AddToParticipantName, BackPic, Pic1, Pic2)

This command allows you to launch the Simple acquisition and to change the background picture and pictures associated with trigger zones 1 and 2 (initially defined in the Simple tab of the

configuration panel).

Caution: this command manages the opening and closing of the recording data files. This means that you will not have to use `OpenRec` and `CloseRec`.

Replace *"**AddToParticipantName**"* with a suffix that will be added to the recording file's name.

The following table describes the other parameters.

PARAMETER	DESCRIPTION
BackPic	Background picture filename
Pic1	Picture filename associated with trigger zone 1
Pic2	Picture filename associated with trigger zone 2

Example*:* for the participant "*Toto*", the command
`RecNewPics(_P2,YellowBack.bmp,Capsela.bmp,car.bmp)`*:*

- saves the data under the name "*toto_P2*";
- the background picture is "YellowBack.bmp" ("*BackPic*" is "*YellowBack.bmp*");
- the picture associated with trigger zone 1 is "*Capsela.bmp*";
- the picture associated with trigger zone 2 is "*car.bmp"*.

Launches the Simple acquisition, changing picture names and uses `RecNewPics&Usages(AddToParticipantName, BackPic, UseBack, Pic1, UseZone1, ShowOnStart, HideOnPress, Pic2, UseZone2)`

This command is a "compilation" of `RecNewPics` and `RecNewUsages` (see above). It launches the Simple acquisition, allowing you to change the pictures and their activation for background and trigger zones at the same time.

Caution: this command manages the opening and closing of the recording data files. This means that you do not have to use `OpenRec` and `CloseRec`.

Replace *"**AddToParticipantName**"* with a suffix that will be added to the recording file's name.

Parameters for use can be given two values:

- "TRUE": activates the parameter;
- "FALSE": deactivates the parameter.

The following table describes the parameters (assuming a "TRUE" value for use parameters):

PARAMETER	DESCRIPTION
BackPic	Name of the background picture file.
UseBack	Use the background picture
Picture1	Name of the picture file associated with trigger zone 1.
UseZone1	Use trigger zone 1
ShowOnStart	Display the picture associated with trigger zone 1 as soon as the protocol

	recording begins
HideOnPress	Hide the picture associated with trigger zone 1 as soon as the participant presses the pen on the tablet. **Caution**: this parameter will only be taken into account if "`ShowOnStart`" is activated.
UseZone2	Use trigger zone 2
Picture2	Name of the picture file associated with trigger zone 2.

Example

For the participant "*Toto*", the command

```
RecNewPics&Usages(_P4,Bkgnd.bmp,TRUE,Capsela.bmp,TRUE,TRUE,TRUE,car.bmp,FALSE)
```

- the recorded data will be saved under the name "*toto_P4*";
- the background picture is "*Bkgnd.bmp*";
- the background picture will be displayed (*UseBack = TRUE)*;
- the picture file named "*Capsela.bmp*" is associated with trigger zone 1;
- trigger zone 1 will be used (*UseZone1 = TRUE*);
- the picture associated with trigger zone 1 will be displayed when the command starts (*ShowOnStart = TRUE*);
- the picture associated with trigger zone 1 will be removed as soon as the participant presses the pen on the tablet to write or draw (*HideOnPress=TRUE*);
- the picture "*car.bmp*" is associated with trigger zone 2;
- trigger zone 2 will not be used (*UseZone2 = FALSE*).

Sets new coordinates for trigger zones 1 and 2

`SetPicsZones(x1Zone1, y1Zone1, x2Zone1, y2Zone1, x1Zone2, y1Zone2, x2Zone2, y2Zone2)`

This command redefines the coordinates of trigger zones 1 and 2 on the tablet. These coordinates will replace the coordinates defined in the configuration panel of Eye and Pen (Simple tab). These new values will remain until the original values are restored by the "RestoreOriginalPicsZones" command (see below).

Replace "***X1Zone1***", "***Y1Zone1***", "***X2Zone1***", "***Y2Zone1***" with the new coordinates you want to use for **trigger zone 1**.

Replace "***X1Zone2***", "***Y1Zone2***", "***X2Zone2***", "***Y2Zone2***" with the new coordinates you want to use for **trigger zone 2**.

Reminder: coordinates are defined in tablet units.

Example

The command `SetPicsZones(27094,23480,30480,18203,27094,14626,30480,9434)` defines:

- the coordinates for trigger zone 1 : X1=*27094,* Y1=*23480,* X2=*30480,* Y2=*18203 ;*
- the coordinates for trigger zone 2 : X1=*27094*, Y1=*14626,* X2=*30480,* Y2=*9434.*

Restores original coordinates for trigger zones 1 and 2

`RestoreOriginalPicsZones`

This command restores the coordinates for trigger zones 1 and 2 that were originally defined in the configuration panel (Simple tab), before being redefined via the `SetPicsZones` command (see above).

Launches the Simple acquisition mode, redefining all parameters

RecNewAll(AddToParticipantName, BkPic, UseBack,
Picture1, x1Zone1, y1Zone1, x2Zone1, y2Zone1, UseZone1,
ShowOnStart, HideOnPress,
Picture2, x1Zone2, y1Zone2, x2Zone2, y2Zone2, UseZone2,
X1ZoneEnd, Y1ZoneEnd, X2ZoneEnd, Y2ZoneEnd)

This command launches the Simple acquisition paradigm, redefining all the parameters of the acquisition configuration panel (Simple tab).

Caution: this command manages the opening and closing of the recording data files. This means that you do not have to use OpenRec and CloseRec.

Replace "***AddToParticipantName***" with a suffix that will be added to the recording file's name.

Replace "***x1Zone1***", "***y1Zone1***", "***x2Zone1***", "***y2Zone1***" with new coordinates for trigger zone 1 (in tablet units).

Replace "**x1Zone2**", "***y1Zone2***", "***x2Zone2***", "***y2Zone2***" with new coordinates for trigger zone 2 (in tablet units).

Replace "**x1ZoneEnd**", "***y1ZoneEnd***", "***x2ZoneEnd***", "***y2ZoneEnd***" with new coordinates for the "end" zone (in tablet units).

The other parameters can be given two values:

- "TRUE": activates the parameter;
- "FALSE": deactivates the parameter.

The following table describes the other parameters (assuming a "TRUE" value for use parameters):

PARAMETER	DESCRIPTION
UseBack	Use background picture.
BackPic	Name of the background picture file.
Picture1	Name of the picture file associated with trigger zone 1.
UseZone1	Use trigger zone 1.
ShowOnStart	Display the picture associated with trigger zone 1 as soon as the protocol recording begins.
HideOnPress	Hide the picture associated with trigger zone 1 as soon as the participant presses the pen on the tablet. **Caution**: this parameter will only be taken into account if "*ShowOnStart*" is activated.
UseZone2	Use trigger zone 2.

Picture2	Name of the picture file associated with trigger zone 2.

Example

For the participant "*Toto*", the command
`RecNewAll(_P5,YellowBkgnd.bmp,TRUE,Capsela.bmp,27094,23480,30480,18203,TRUE,TRUE,TRUE,car.bmp,27094,14626,30480,9434,FALSE,12456,1845,14170,1235)` *defines:*

- the data that will be saved under the name "*toto_P5*" ("toto_P5.tab")
- the background picture is "*YellowBkgnd.bmp*";
- the background picture will be displayed (*UseBack = TRUE)*;
- the picture file named "*Capsela.bmp*" is associated with trigger zone 1;
- the coordinates of trigger zone 1 on the tablet are :
  X1=27094, Y1=23480, X2=30480, Y2=1820
- trigger zone 1 will be used (*UseZone1 = TRUE*)*;*
- "*Capsela.bmp*" will be displayed when the command starts (*ShowOnStart = TRUE*);
- the picture associated with trigger zone 1 will be removed as soon as the participant presses the pen on the tablet to write or draw (*HideOnPress=TRUE*);
- the picture "*car.bmp*" is associated with trigger zone 2
- the coordinates of trigger zone 2 on the tablet are:
  X1=27094, Y1=14626, X2=30480, Y2=9434;
- trigger zone 2 will not be used (*UseZone2 = FALSE*)*;*
- the coordinates of the "end" zone on the tablet are:
  X1=12456, Y1=1845, X2=14170, Y2=1235.

Sets if tracing should be displayed on screen

`ShowSimpleTrace(Visible)`

This command defines if the pen trace should be displayed on screen with the Simple acquisition paradigm (`RecStandard`).

Replace "***Visible***" with one of the following values:

- "TRUE": trace will be displayed;
- "FALSE": no trace will be shown.

Sets the maximum display duration for pictures associated with tablet zones

`SetRecStandardMaxDisplay(MaxDurationForPicture1, MaxDurationForPicture2)`

This command defines the maximum display duration for the pictures associated with trigger zones 1 and 2 of the Simple acquisition paradigm (`RecStandard`).

Example

The command `SetRecStandardMaxDisplay(1000,2000)` limits the duration of the picture display to 1 second (1,000 milliseconds) when the participant presses the pen in zone 1 and to 2 seconds when the pen is pressed in zone 2.

Special value: -1 (unlimited duration). This is the default value when no value has been explicitly defined.

NetSync

The NetSync module allows you to drive a recording session on several computers via network commands (see Netsync in the User manual).
The commands shown below should only be used in this context.

Stops the script until a signal is sent by the Master host

`WaitForNetSync`

This command halts script execution.
Script execution resumes when the "Go" signal is received from the Master host.

Sends a message to the Master host

`SendMessageToNetSync(Message)`

This command allows you to send a message to the Master host. This message is displayed in the "State" column of the NetSync data grid holding the client hosts.

Examples of use

- Show (on the Master host) the item currently being processed on the client host;
- Follow the stages of the experiment on each client host;

Example

The command `SendMessageToNetSync(item 3)` sends the message "item 3" to the Master host.

The message may include or be based on one or more keywords (see *Keywords* section, p. 55). For example, `SendMessageToNetSync(%L%)` sends the current list item; `SendMessageToNetSync(item %I%/%LCount%)` sends the label counter value and the number of items in the list (e.g. "item `5/12`").

Network messaging

Using the UDP protocol, the following commands allows to send messages to another device on the same network.

Activates/deactivates network messaging feature

`UseNetMessaging(Active)`

This command enables/disables a network messaging feature (UDP protocol).
Replace "***Active***" with one of the following values:

- "TRUE": network feature is enabled;
- "FALSE": network feature is disabled and communication is closed.

Communication parameters are set in the configuration panel, Network tab. The Device test / Network message menu allows to test that the connection is properly working.

Sends a message to another computer

SendNetMessage(Message)

As its name says, this command sends your message through the network to another computer. For this command to work, network messaging feature should have been activated first (see previous command).

I/O

The following commands allows to use the computer parallel port to send or receive data. A classical usage is to send or receive triggers from/to another device, such as an EEG recorder, for example. The port configuration part is dealt with in the Eye and Pen User manual.

Activates/deactivates parallel port

UseParallelPort(Active)

This command enables/disables a parallel port driver.
Replace "***Active***" with one of the following values:

- "TRUE": parallel port feature is enabled;
- "FALSE": parallel port feature is disabled.

Communication parameters are set in the configuration panel, Network section. The Device test/Network message menu allows to test that the connection is properly working.

Sends a number through parallel port

SendToParallelPort(aValue)

As its name says, this command sends a numeric value through the parallel port. For this command to work, parallel port driver should have been activated first (see `UseParallelPort`).

Replace "***aValue***" by a number between 0 and 255.

Sends a number through parallel port

SetParallelPortLines(LinesState)

This command allows to individually set the parallel port lines state, either high (+5volts) or low (0 volt).

For this command to work, the parallel port driver should have been activated first (see `UseParallelPort`).

Replace "***LinesState***" by a series of values, either 0 (low) or 1 (high), one for each of the 8 lines of the parallel port. Lines are from 1 (left) to 8 (right).

Example

`SetParallelPortLines(10000000)` set high line number 1 and low all the others.

Stops the script until a specific value is recieved on the parallel port

`WaitForParallelPortValue(aValue)`

This command puts the script in pause until a particular value is read on the parallel port. For this command to work, parallel port driver should have been activated first (see `UseParallelPort`).

Replace "***aValue***" by a number between 0 and 255.

Note: this command can be cancelled with a key press on the "Escape" or "F12" keyboard key.

Example of use

This command can be used to synchronize and experiment with an external device or another computer.

Keywords

Keywords are special words that are replaced by a "definite" value during script execution. Keywords can be likened to the notion of *variable* that is used in common programming languages, except that a keyword cannot be modified by hand, being "read-only" (its value can only be "read" by a script). Keywords can be included in every parameter of every script command.

Date of the day

`%D%`

When executing the script, this keyword is replaced with the curent date formatted as: YYYY-MMM-DD (year, month, day).

Example

The following command display the date:

```
DisplayMsg(%D%,-1,-1,-1,TRUE)
```

Retrieves an element

`%E`*`Value`***`%`**

When executing the script, this keyword is replaced with the element in position given by "*Value*" in the list of elements created after an item has been split with the command `GetElements`.

Example

The following command display the 2nd element:

```
DisplayMsg(%E2%,-1,-1,-1,TRUE)
```

Takes on the number of elements in the item

`%ECount%`

When executing the script, this keyword is replaced with the number of elements found in the item after it has been split with the command `GetElements`.

Example

The following command may be used to exit a loop when all the elements of an items have

been processed:
`JumpToIfNumberIs(End,%ECount%,TRUE)`

Retrieves group name

%G%

When executing the script, this keyword is replaced with the name of the group set in the script launching dialog box.

Takes the value of the current label's internal counter

%I%

This keyword is replaced with the value of the current label's counter (the last label read in the script).

Example

The following command adds the value of the current label's counter to the name of the protocol recording filename (participant id.): `OpenRec(_%I%)`

Last keyboard key pressed

%K%

When executing the script, this keyword is replaced with the name of the last keyboard key pressed.

Beware that the key name is returned in upper case. Thus, a keypress on "e" will return "E".

Retrieves an item from the list in the position corresponding to the current label's counter value

%L%

During script execution, this keyword is replaced with the content of an item retrieved from the list (the item is the one whose position in the list corresponds to the current label's counter value). `%L%` may be included in the parameters of all the commands.

Example

The following script adds items to the list, randomizes the list, and has the items displayed on the screen. This example shows how to create a loop to manage the list content. Thanks to `%L%`, the script will remain the same for 100 items.

```
ResetList

; add two items: picture filenames
AddToList(image1.bmp)
AddToList(image2.bmp)

; shuffle the entire list
RandomizeList
:Start

   ; %L% retrieves the item at position "n" in the list, "n" being the "Start" label' s
   ; counter value.

   ; The command displays this picture (its name has just been retrieved from the
   ; list) ; for 2000 milliseconds, centered on the screen.
    displaypic(%L%,-1,-1,2000)
```

```
; if the counter value of the current label ("Start") is 2, then jump to the label
; named "End"
 JumpToIfNumberIs(End,2,True)

; if not, jumpt to "Start" for another round
JumpTo(Start)

:End
```

Takes on the number of items in the list

%LCount%

When executing the script, this keyword is replaced with the number of items found in the list (list size).

Example

The following command may be used to exit a loop when all the items have been processed:

```
JumpToIfNumberIs(End,%LCount%,TRUE)
```

Retrieves an Eye and Pen folder path

%P*Folder***%**

When executing the script, this keyword is replaced with the specified folder path value of Eye and Pen. Values can be:

- %PImages% will be replaced with the path to the Stimuli (pictures, etc.) folder;
- %PData% will be replaced with the path to the Data folder;
- %PModels% will be replaced with the path to the Models folder;
- %PScripts% will be replaced with the path to the Scripts folder.

Example1

To display a picture found in the subfolder named "DStim" of the Stimuli folder of Eye and Pen:

```
DisplayPic(%PImages%DStim\img1.bmp,2000,-1,-1)
```

Example2

Change the default Stimuli folder for a subfolder: `SetPicsDirectory(%PImages%Dynapen)`

Example3

Change the default Stimuli folder for a "neighbour" folder (located at the same level in the folder tree): `SetPicsDirectory(%PImages%..\MyExperimentStimuli).`

Note the "`..`" that instruct to go up one level in th efolder tree. This is a Windows command syntax element.

Example4

You want to display the path to the Stimuli folder for 3 seconds:

```
DisplayMsg(%PImages%,3000,-1,-1,FALSE)
```

Takes a random number

%R*Value***%**

When executing the script, this keyword is replaced with a random number.
Replace `Value` with the upper limit of the range within which the random number must be taken. The range goes from 0 to `Value`.

Example 1

The following command waits for a random duration of between 0 and 499 milliseconds (inclusive): `WaitFor(%R500%)`

Example 2

Create a delay of 1,000 milliseconds: `WaitFor(1000)`

Create a random delay of between 0 and 500 milliseconds: `WaitFor(%R501%)`

Participant's name

%S%

When executing the script, this keyword is replaced with the participant's ID (as provided in the script launching dialog box).

Caution: commands that load a file whose name includes this keyword will not be checked (no such files are supposed to exist at the time of script checking).

Example

The command `DisplayPic(%S%_page1.bmp,-1,-1,-1)` can be used to reload a page previously written by a participant and saved with the command `SaveScreenToBMP(%S%_page1).`

Time

%T%

When executing the script, this keyword is replaced with the curent time formatted as: hh-mm-ss (hour, minute, second).

Example

The following command display the current time:
`DisplayMsg(%T%,-1,-1,-1,TRUE)`

Uses a label's counter value within a keyword

%?:Label%

The label's counter value may be invoked within any keyword (except `%Lcount%`, obviously).

You can therefore "target" a specific label's counter value.

Unlike the syntax used with other commands, here the label should be mentioned with its ":", just as it is shown in the script (alone on a line).

The "**?**" is replaced with a keyword, either **E**, **I**, **L** or **R**.

Example 1

The following command uses the value of the "Start" label's counter as an index to retrieve an item in the list: `DisplayPic(%L:Start%.jpg,-1,-1,-1)`

Example 2

The value of the "`Start`" label's counter is used to help "build" the name of a picture to be displayed, e.g. "pic_3.bmp".
`DisplayPic(pic_%I:Debut%.bmp,-1,-1,-1)`

Example 3

The command `WaitFor(%R:label3%)` receives a random value of between 0 and the value

of the "label3" label counter.

Example 4

The command WaitFor(%L:label3%) uses the item in the list whose position corresponds to the value of the "Label3" label counter. This then allows you to manipulate delays using the list items.

Example 5

The command SetPenColor(%L%) selects the ink color from the list.

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  - SetDataDirectory
  - SetModelsDirectory
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  - UseParallelPort
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SCRIPT EXAMPLES

This section of the manual is intended to help you learn/practice script writing based on practical cases.

1. Have a task re-done

This script allows the participant to start task 1 a maximum of four times and task 2 a maximum of two times.
Each task is triggered by a zone on the tablet (we will call the zones' coordinates on the tablet X1, Y1, X2 and Y2, but in a "true" script you must replace these symbols with values expressed in tablet units).
We want to record the participant's activity on each occasion, i.e. in a different acquisition file.
When the maximum is reached for a given task, if the participant presses the relevant zone again, nothing will happen. When he or she presses the pen in the zone associated with "Stop", the script will jump to the label named "Next".

```
;       we define three zones on the tablet, each being associated with a label
DefineTabZone(x1,y1,x2,y2,Task1)
DefineTabZone(x1,y1,x2,y2,Task2)
DefineTabZone(x1,y1,x2,y2,Stop)
JumpTo(Go)

:Task1
  JumpToIfNumberIs(Go,5,FALSE)
  OpenRec(_task1_%I%)
  ;       do something
  JumpTo(Go,TRUE)

:Task2
  JumpToIfNumberIs(Go,3,FALSE)
  OpenRec(_task2_%I%)
  ;     do something
JumpTo(Go,TRUE)

:Stop
  JumpTo(Next)

:Go
  WaitForTabZones(TRUE,TRUE,TRUE)

:Next
  CloseRec

;  Script continues
```

Note: if the acquisition file is already closed, a call to CloseRec will have no "negative" effect.

2. Mask production (Simple)

This script allows the participant to write a page of text, but the display on the screen will be masked by a plain color (green). The participant will only be able to see what he or she writes in a round zone around the pen tip location (this zone keeps track with the pen tip's position).

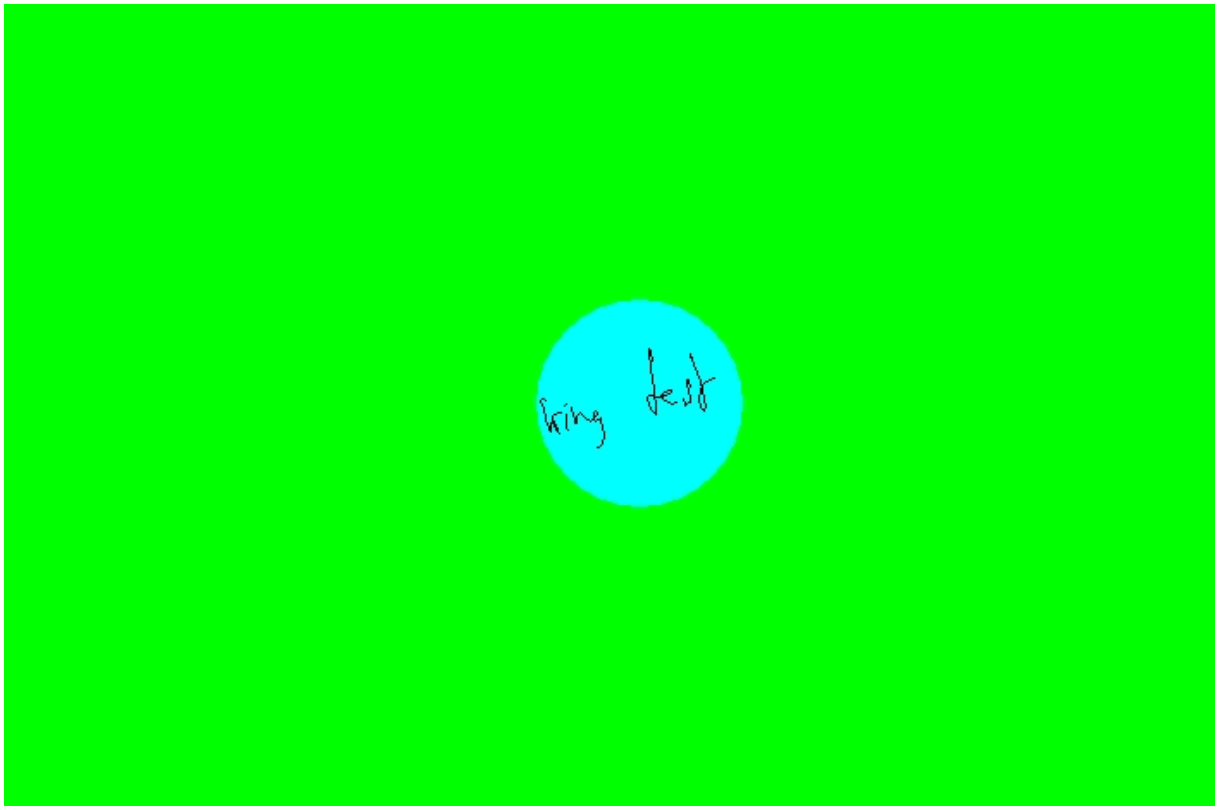

Figure 149: Masking production.

```
;   select the unmasking file, the one that will allow you to see "through" the mask covering
; the display on screen
SetUnmaskFile(..\cursors\Mask_circle120.bmp)

;   masking mode no.1: the display is filled with a plain color
SetMaskingMode(1)

;   filling color: green
SetMaskingFillColor(#00FF00)

;    activate display masking
ActivateFeedbackMasking(TRUE)

;    start recording
RecStandard
```

The unmasking file is contained in the *Cursors* folder, not the *Stimuli* folder, which explains why a relative file path is used here: "`..\cursors\Mask_circle120.bmp`" (for further explanations, see p. 8).

3. Mask production with unmasking locations

The purpose of this script is to have a participant write 5 words in “slots”, whose display on screen will be masked. The participant will only be able to see the word he or she is writing, together with the previous word.

```
;    unmasking file selection
SetUnmaskFile(mask_5_words.jpg)

;    masking mode n°2: a picture file is displayed on screen and covers the production.
SetMaskingMode(2)

;    masking file selection
SetMaskingFillPic(White_Bkgnd_5_words.jpg)

;    define unmasking zones (they match with the “slots” of the masking file
;    from left to right.
DefineUnmaskZone(35,350)
DefineUnmaskZone(200,350)
DefineUnmaskZone(365,350)
DefineUnmaskZone(530,350)
DefineUnmaskZone(695,350)

;    rule: the participant will be able to see the content of the zone he’s in and the left side one
SetUnmaskZonesRange(-1,0)

;    going back is forrbidden: the participant will not be able to unmask a zone
;    previously “visited”
SetUnmaskZonesBackTracking(FALSE)
ActivateFeedbackMasking(TRUE)

;-----Trial n°1
WaitForKeyPressPic(cross.bmp,-1,-1)

;    Hint: we use the same picture as a background and as a mask
DisplayPic(White_Bkgnd_5_words.jpg,-1,-1,-1)
OpenRec(_zone_test)

;    This tablet zone match with the circle in the figure 151.
WaitForTabZoneAt(6072,2981,6248,2805,TRUE,FALSE)
CloseRec
```

Figure 150: “mask_5_words.jpg” picture used for unmasking.

The following figure shows the picture that serve as background and mask, with the representation of an unmasking zone in a dotted line.

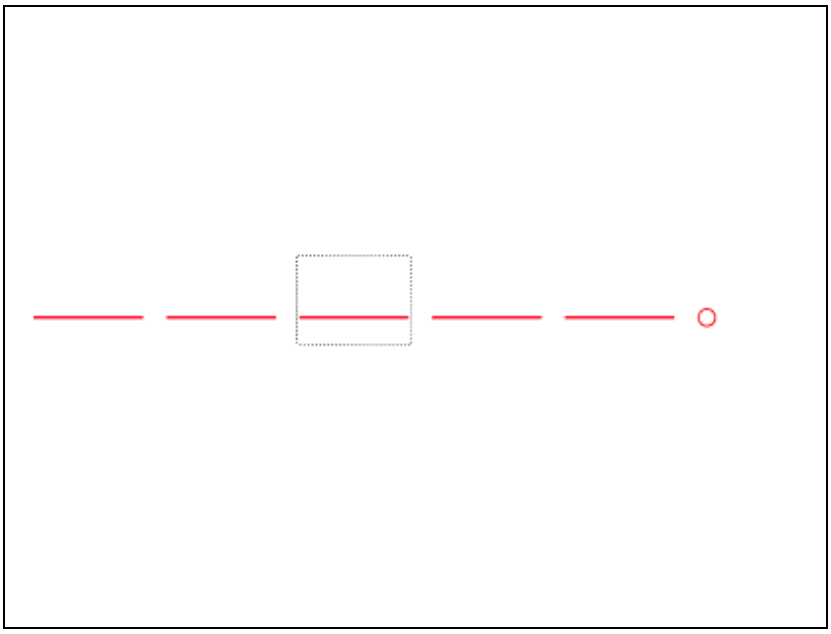

Figure 151: "White_Bkgnd_5words.jpg" (white background with 5 slots for words).

4. Load a list and show its content

The following script loads a list of item from a file (the file named V2_liste.txt, is found in the *Stimuli* folder), then displays it's content, item by item.

```
LoadList(v2_list.txt)
WaitForKeypressMsg(%LCount% items in the list,-1,-1,FALSE)

:Start
  WaitForKeypressMsg(Item %I%:%L%,-1,-1,FALSE)
  JumpToIfNumberIs(StopIt,%LCount%,FALSE)
  JumpTo(Start,FALSE)

:StopIt
```

Using `%LCount%` (number of items in the list) allows you to have all the items in the whole list displayed, however many there are.
`WaitForKeypressMsg(Item %I%:%L%,-1,-1,FALSE)` allows you to display the number (`%I%`) and content (`%L%`) of each item in the list.
Note: to display the picture whose name is listed in the list (at the current position), use `DisplayPic(%L%,-1,-1,-1)`.

The content of the file named "`v2_list.txt`" is:

```
Ent1.jpg
Ent2.jpg
Ent3.jpg
pilori.jpg
studio.jpg
defile.jpg
detenu.jpg
dragon.jpg
```

The JPG pictures listed here should be found in the *Stimuli* folder.

5. Randomize sub-blocks of a list

The following script fills a list with 16 numbers (from 1 to 16) and randomizes two independent sub-blocks. Next, the content of the list is dipslayed, item by item.

```
;  Fill the list with 16 numbers, from 1 to 16
:Fill_In
  AddToList(%I%)
  JumpToIfNumberIs(Next,16,FALSE)
  JumpTo(Fill_In,FALSE)
:Next
;  randomize two independent sub-blocks. Items 1 and 2 are not involved.
RandomizeListRange(3,8)
RandomizeListRange(9,16)
;  Display list's items
:Loop
  WaitForKeyPressMsg(Item %I%: %L%,-1,-1,FALSE)
  JumpToIfNumberIs(Stop,16,FALSE)
  JumpTo(Loop,FALSE)
:Stop
```

Note: the sequence "`JumpToIfNumberIs(Next,16,FALSE)`" then "`JumpTo(Fill_In,FALSE)`" (lines 3 and 4 of the sample above) has the same function as the command "`LoopIfLabelIsBelow(Fill_In,16,FALSE)`": if the value of the "`Fill_In`" label's counter is below 16, then jump to this label.

6. Use two label counters with one "shifted"

The following script shows how it is possible to count, starting with a value greater than 1.

```
SetLabelCounter(Start,2)
WaitForKeyPressMsg(Starting value: %I:Start%,-1,-1,FALSE)

:Start
  :Iteration
  WaitForKeyPressMsg(Iteration %I:Iteration% : %I:Start%,-1,-1,TRUE)
  LoopIfLabelIsBelow(Start,6,FALSE)
```

7. Have a list of words copied, with NetSync

The following script allows you to have a list of items copied by a group of participant. The trials are managed with NetSync (see Netsync in the User manual and p.52 in this manual).

```
DisplayMsg(Welcome !,2000,-1,-1,FALSE)
DisplayMsg(Please, wait a moment...,-1,-1,-1,FALSE)
;  Wait for the start signal sent by the Master host
WaitForNetSync
HideMessage
ResetList
```

```
;    Add items to the list, one by one
AddToList(pilori)
AddToList(studio)
AddToList(defile)
AddToList(detenu)

:start

  ;    Display a star and wait for a "pen press" in a zone located on the left side of the tablet
  DisplayPic(croix.bmp,-1,-1,-1)
  WaitForTabZoneAt(1420,4900,4800,26530,FALSE,FALSE)

  ;    Record the production in a file named <participant>_<item>.TAB
  openrec(_%L%)

  ;    Wait for  500 milliseconds
  WaitFor(500)

  ;    Send the number of item in the list (ex. "Item5/23") to the Master host
  SendMessageToNetSync(Item%I%/%LCount%)

  ;    Display the item whose number in list match the "start" label's counter value
  ;    (item n°1 at first "round" - pilori, item n°2 for the second round -
  ;    studio, etc.)

;    Hint: the extension ".jpg » is appended to the item name to call a matching picture
  DisplayPic(%L%.jpg,-1,-1,-1)

  ;    When the pen is pressed in the writing zone, clear the display
  WaitForTabZoneAt(4800,0,54200,31800,FALSE,FALSE)
  HidePicture

  ;    Wait for a "pen press" in the "end" zone. Participant's writing is displayed on screen.
  WaitForTabZoneAt(44930,23450,54200,31800,FALSE,TRUE)
  CloseRec

;    If the current item is the last one, jump to the "end » label
  JumpToIfNumberIs(end,%LCount%,FALSE)
  JumpTo(start,FALSE)
:end
DisplayMsg(Thanks for coming !,1000,-1,-1,FALSE)
```

Note : to "synchronize" the copy task item by item, i.e. to have the participants to wait before each trial (a collective "Go" is sent par the Master host to "unlock" the trial), the command `WaitForNetSync` could have been inserted at the beginning of the "start" block, after a message saying to wait, like in the following example:

```
:start

DisplayMsg(Be ready...,-1,-1,-1,FALSE)
WaitForNetSync
HideMessage

  ;    Display a cross…
  DisplayPic(croix.bmp,-1,-1,-1)
```

8. Dictation of a text

The following scriptallows you to dictate a text, previously recorded as an audio file (Wave format) and save into the *Stimuli* folder.

```
;   Display the instructions contained in the text file named "Instructions.txt".
DisplayText(Intsructions.txt,-1)

;   Wait for the participant to press the pen in the zone labeled "Start dictation".
;   Parameter: wait until the press is lifted up to go on
WaitForTabZoneAt(25670,20780,29400,18815,FALSE,TRUE)

;   Clear the instructions text
HideText

;   Open the acquisition file<participant>_dictation.TAB
OpenRec(_dictation)

;   Play the audio file and go on with the script without waiting
PlaySound(dictation.wav,FALSE)

;   Wait for the pen to be pressed in the zone labeled « I'm finished » on the tablet.
;   The participant's writing is displayed until this event.
WaitForTabZoneAt(25970,5565,28900,3915,TRUE,FALSE)

;   Close the acquisition file.
CloseRec
```

9. Copying along with a mental load

The following script allows you to have a participant to copy a word after having heard a list of numbers. Next, he'll be to recall (write down) these numbers.

```
WaitForKeyPressPic(wait.bmp,-1,-1)

;   Plays the audio recording of the numbers 1-3-8-9-5.
Playsound(13895.wav,TRUE)
DisplayPic(croix.bmp,5000,-1,-1)

;   Open the acquisition file named <participant>_5Ejournal.TAB for the copy.
OpenRec(_5Ejournal)

;   Display the word to copy
DisplayPic(E-journal.bmp,-1,-1,-1)

;   Write until the pen is presses in the tablet "end" zone
WaitForTabZoneAt(6580,3830,7100,2270,TRUE,TRUE)
HidePicture

;   Close the acquisition file and open a new acquisition file for the numbers transcription
CloseRec
OpenRec(_5EjournalCH)

;   Display the start signal to write numbers down.
DisplayPic(B-rappelchif.bmp,-1,-1,-1)

;   Write until the pen is pressed in the tablet "end" zone.
WaitForTabZoneAt(6580,1500,7100,0,TRUE,TRUE)
CloseRec
HidePicture
```

BIBLIOGRAPHY

Marquardt, C., Gentz, W., Mai, N. (1999). Visual control of automated handwriting movements. Experimental Brain Research, 128, 224–228.

APPENDIX – KEYBOARD KEYNAMES

Here a list of keyboard key names, as used by WaitForKeypress and %K%.

Please, note that some keyboard may lack some keys, so using common keys is advisable. As usual, it is safe to perform some tests before perfomring an acquisition.

As an alternative, you may use a script snippet to press a key of the keyboard and get his name:

WaitForKeypress()

DisplayMsg(Key name: %K%,-1,-1,1000,TRUE)

Key name	Function
BACK	BACKSPACE key
TAB	TAB key
CLEAR	CLEAR key
ENTER	ENTER key
SHIFT	SHIFT key
CTRL	CTRL key
MENU	ALT key
PAUSE	PAUSE key
CAPSLOCK	CAPS LOCK key
ESC	ESC key
SPACE	SPACEBAR
PAGEUP	PAGE UP key
PAGEDOWN	PAGE DOWN key
END	
HOME	
LEFT	LEFT ARROW key
UP	UP ARROW key
RIGHT	RIGHT ARROW key
DOWN	DOWN ARROW key
SELECT	SELECT key
PRINT	PRINT key
EXECUTE	EXECUTE key
PRINTSCREEN	PRINT SCREEN key
INS	INS key
DEL	DEL key
HELP	HELP key
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
A	

B	
C	
D	
E	
F	
G	
H	
I	
J	
K	
L	
M	
N	
O	
P	
Q	
R	
S	
T	
U	
V	
W	
X	
Y	
Z	
LWINDOWS	Left Windows key
RWINDOWS	Right Windows key
RMENU	Applications key
NUMPAD0	Numeric keypad 0 key
NUMPAD1	Numeric keypad 1 key
NUMPAD2	Numeric keypad 2 key
NUMPAD3	Numeric keypad 3 key
NUMPAD4	Numeric keypad 4 key
NUMPAD5	Numeric keypad 5 key
NUMPAD6	Numeric keypad 6 key
NUMPAD7	Numeric keypad 7 key
NUMPAD8	Numeric keypad 8 key
NUMPAD9	Numeric keypad 9 key
*	Multiply key
+	Add key
,	Separator key
-	Subtract key
.	Decimal key
/	Divide key
F1	
F2	
F3	
F4	
F5	
F6	
F7	
F8	
F9	
F10	

F11	
F12	
F13	
F14	
F15	
F16	
F17	
F18	
F19	
F20	
F21	
F22	
F23	
F24	
NUMLOCK	NUM LOCK key
SCROLLLOCK	SCROLL LOCK key
LSHIFT	Left SHIFT key
RSHIFT	Right SHIFT key
LCONTROL	Left CONTROL key
RCONTROL	Right CONTROL key
LMENU	Left ALT key
RMENU	Right ALT key