How to create your own external command in Aspan
First lesson

In this first part of the training course, we will study what an "external command" means in Aspan and how to create a new one.

What's an "external command”

With the external command term we indicate all commands and functions that any expert user may add in Aspan as he likes to make easier to draw or to manage machinings.

First of all let's see with Windows explorer where, in our computer, the various Aspan external commands are.
All external commands are found into the “Macro” folder, found into the folder where Aspan has been installed (“C:\Aspan4” by default)
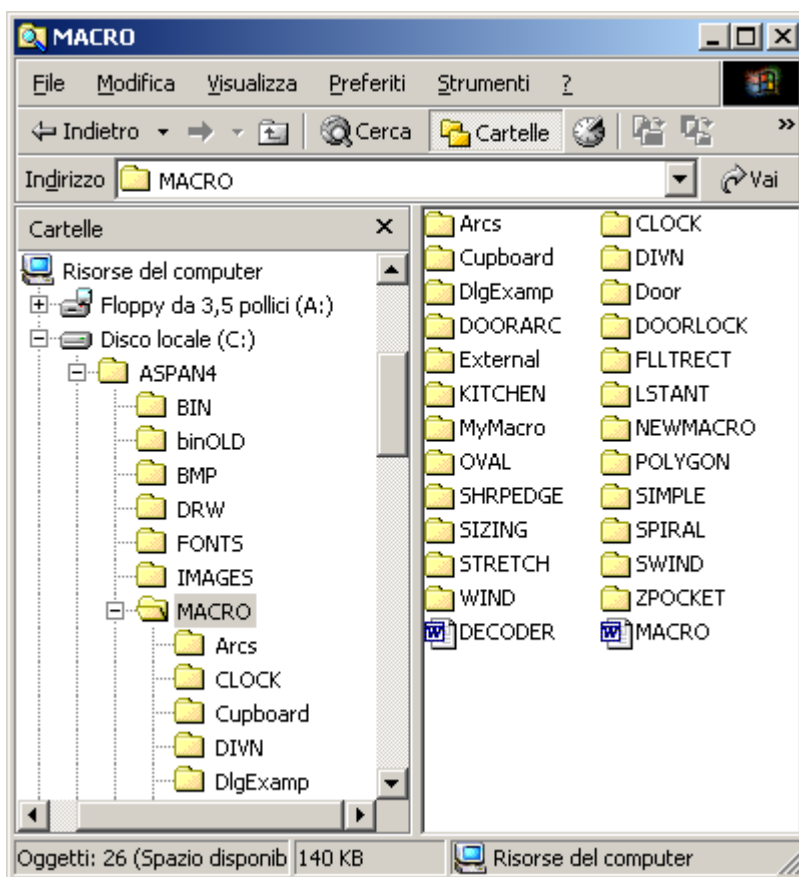

Fig. 1

As you can see in figure 1, folder “Macro” is composed by many other folders, each representing a single external command.

When Aspan is installed for the first time, some predefined external commands are supplied, as the command to make a lock, an oval and other.
Among the supplied external commands we can found the "MyMacro" one, that we will use during this training course as a base to build up our first "external command".
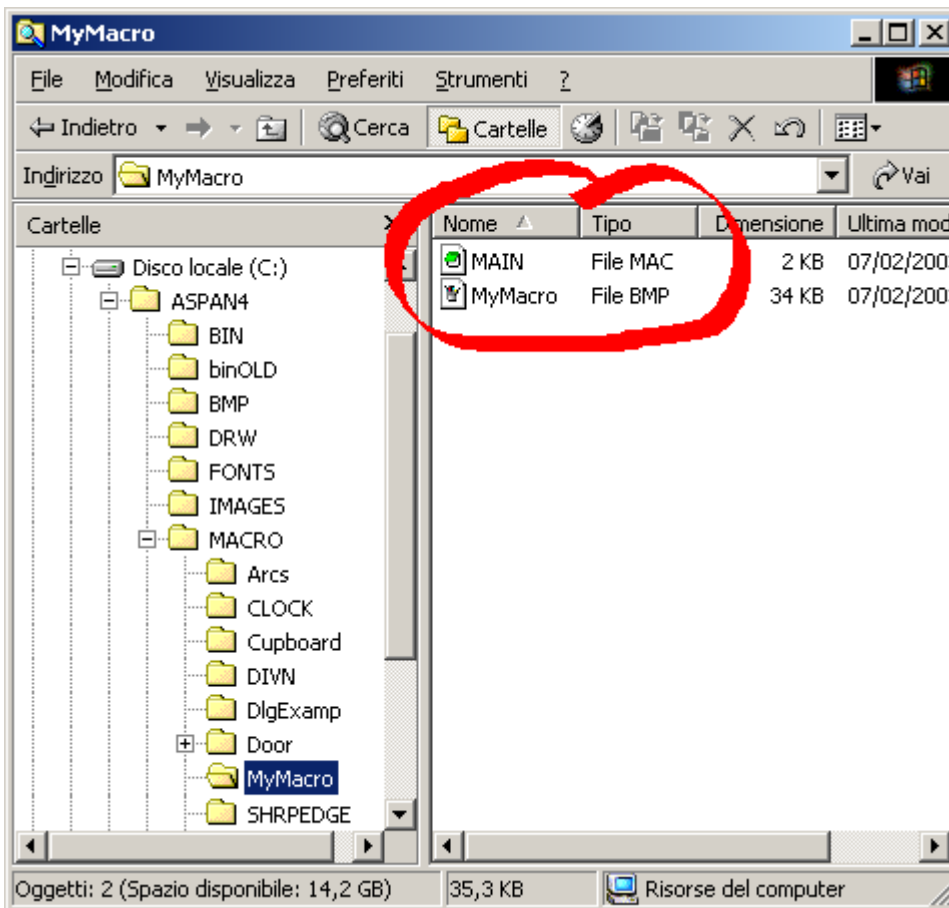
Fig. 2

If we analyze the contents of "MyMacro" folder, as you can see in figure 2, into it we will find two files: "Main.mac" and "MyMacro.bmp".

The structure of "Main.mac" file

Let's start to analyze the first of these files: "Main.mac".
"Main.mac" file represent into Aspan our external command. In fact into it we will define what our command will do.
If we open this file with any Text Editor (NotePad, WordPad, EditPad, etc…) we can see that it can be separated into three different sections: the heading, the dialog section and the drawing section.

Let's see how the heading of an "external command" is composed:

ID=MYMACRO1
TITLE=My Macro Title
TIP=My Macro
HelpTip=My Macro Description
IMAGE=My Macro.bmp
PLAYERVERSION=1

$$$default_END$$$

The "ID" field represents the "external command" identifier, that is an unique name used to discriminate the various "external commands". Usually it is convenient to make use as "ID" the

same name of the folder containing the command. In this case the folder name is "MyMacro" and then we will set the header "ID" field to the value "MYMACRO1". The numerical value "1" has the purpose to discriminate the various ".MAC" files that may compose our "external command" (as described in details later in this document).

The "TITLE" field represents the "external command" name. Its function is the same as the "ID" field, that is it allows to recognize a particular "external command" among the various commands available in our Aspan version, but with an advantage: it is more comprehensible and descriptive. In detail the "ID" value is used by Aspan internal procedures, while the "TITLE" field may be used by the users.

The same functionality to allow to easily find a particular external command in the commands list, may be also found in the two successive fields: "TIP" and "HelpTip". In these two values we can write a more detailed description of what our external command will do.

Through the "IMAGE" field it is possible to associate an image to our "external command". This explains meaning of the second file "MyMacro.bmp" in "MyMacro" folder.

The last two field of the heading are "PLAYERVERSION" and a cryptic and strange text "$$$default_END$$$". The first says the version of the text interpreter Aspan is using to elaborate the "external command", the latter represents the end of the heading section.
These two fields must always be present (and with the same values), together with the "ID" field, in the heading of the ".mac" file of any "external command".

In the following figure (Figure 3) we can see where the heading fields are used in Aspan.
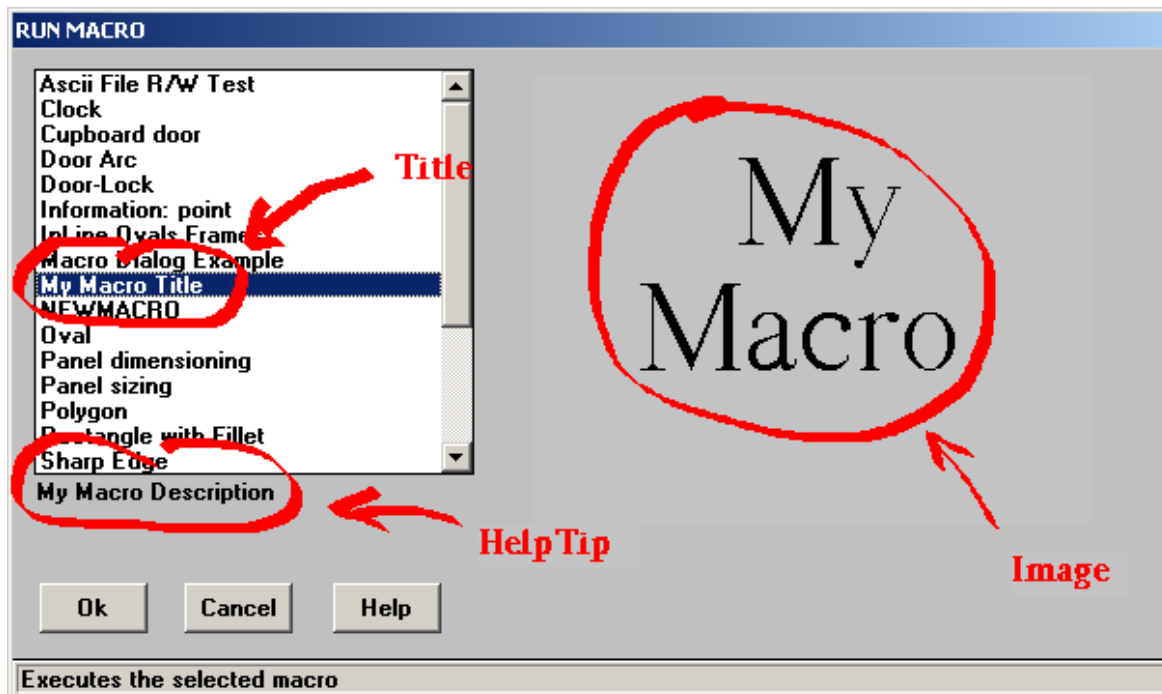

Fig. 3

We have studied what the heading of an "external command" is made for, now let's see which are the functions in the dialog and drawing section.

~START DIALOG
 ....

```
  .........
~END

~START DRAW
  .........
  .........
~END
```

First of all we note that these two sections are delimited by the following keywords: "~START" and "~END".
Then all text found between "~START DIALOG" and "END" words, belongs to the dialog section, while all text found between "~START DRAW" and "END" words, belongs to the drawing section.

This means that in the dialog section, as suggested by the word, we will write all instruction to be used to "dialog" with the user, and to obtain all information needed to execute the task required by the "external command" we are creating.
For instance, if our "external command" is made to create a simple routing, the information we need to require to the user will be the start point and the end point, the routing diameter and the depth.
We will see in the proceeding how to obtain from the user data by a series of dialog windows.

For what concerns the drawing section, its function is to contains all instructions needed to draw or to create machining for our external command.
Returning back to the routing example, in the drawing section we will write the instructions that, given the information acquired from the user, will allow to draw on the panel our routing.

How to create a new "external command"

To create a new "external command", we then need to create a new folder under Aspan "Macro" one and to copy into it the two files "Main.mac" and "MyMacro.bmp" that will be always used as a base for any successive creation of new commands.

Once created the new folder and copied into it our files, do not forget to change in the "Main.mac" file the value associated to the heading fields, in details the values in the "ID" and "TITLE" fields.
Now that the base of our "external command" is created, let's go and write all instructions needed to let Aspan make the actions required.

Second lesson

In this second lesson of our training course we will start to study the various instructions available to create our "external command".
In particular, in the following, we will study the instructions capable to draw entities.
As they are drawing instructions and as described in the first lesson, the interested section of the "Main.mac" file to be written will be the drawing one.

Drawing instructions

In the following we will see some of the most important of the drawing instructions, giving a quick description and, at the end, how to test them.

The first instruction we meet is:

~G0(<x>,<y>,<depth>,<tool diam>)

This instruction allows to position our starting point in any point of the drawing environment (<x>, <y>). We have to remember that when we draw anything we are in Aspan drawing environment and we are drawing on a panel; then we must define the depth where we are (<depth>) and what is the tooling diameter we are going to use to execute our drawing (<tool diam>). At this point you are certainly noted the various analogy with the drawing commands found in ASPAN CAD environment, as the "drawing a line" command.

With the second instruction, associated to the previous one, we will complete the drawing of a simple straight line (or routing):

~G1(<x>,<y>,<depth>)

If the x and y coordinates of the previous instruction represent the starting point of the drawing, now the coordinates of this instruction represent the end point of our straight line.

If we want we already can try to write the first instructions in our "external command". Let's open the "Main.mac" file, in "C:\Aspan4\Macro\MyMacro" folder, with any text editor and we will write in the drawing section the code (group of instructions) to draw a straight line.

```
~START DRAW
        # start point coordinates
         ~LET [STARTX] = 50
         ~LET [STARTY] = 50
        # end point coordinates
         ~LET [ENDX] = 500
         ~LET [ENDY] = 50
        # let's position the start point on the panel
         ~G0([STARTX],[STARTY],5,10)
        # draw the straight line
         ~G1([ENDX],[ENDY],5)
~END
```

To test the result of our instructions, let's go in Aspan CAD and call our "MyMacro" external command.

In the same way we can draw arcs using one of the following instruction, depending on which one is more convenient to us.

Clockwise arc given the coordinates of its center

~G2(<x>,<y>,<depth>,<xc>,<yc>,<zc>)

Clockwise arc given its radius

~rG2(<x>,<y>,<depth>,<r>)

Counterclockwise arc given the coordinates of its center

~G3(<x>,<y>,<depth>,<xc>,<yc>,<zc>)

Counterclockwise arc given its radius

~rG3(<x>,<y>,<depth>,<r>)

Arc given any three points

~ARC_3P(<x>,<y>,<depth>,<xp>,<yp>)

In the previous instructions the values <x> and <y>, <xc> and <yc>, <xp> and <yp> represent the coordinates of the following points: end, center, any point on the arc. The value <r> represents the radius of the arc.

To practicing with these instructions we can try to draw the various arcs described before.

Every line or arc that we draw they represent routings, in Aspan.
But in Aspan we can also draw holes: The following is the instruction to draw holes:
    ~B(<x>,<y>,<depth>,<tool diam>)

It follows a series of instruction to set the tool diameter, the tool correction , to change the working face, to set the panel dimensions. For more detail and for the macro instruction list see the macro documentation.

```
-------------------------------------------------------
-------------------------------------------------------
~DIAM(<tool diam>)              #Set diameter
-------------------------------------------------------
-------------------------------------------------------
~C(<tool correction>)           #Set Tool correction: 0 (none),
                    #              1 (right),
                    #              2 (left),
                    #              3 (length)
-------------------------------------------------------
-------------------------------------------------------
~F(<panel face>)                #Change Face: 1(upper),
                    #            2(right),
                    #            3(left),
                    #            4(front),
                    #            5(rear),
                    #            6(bottom)
-------------------------------------------------------
-------------------------------------------------------
~SETPANEL(<DX>,<DY>,<DZ>,<use formulas>,<remove ext holes>)
```