# How to build a circular staircase

This tutorial explain how to build a circular staircase. The staircase will be composed of 13 steps of 20 cm height and 1m width. Its total height total will be 13 x 20 cm = 2 m 60. The angle of a step will be of 15° in order to obtain a winding staircase on 180°. The staircase will include an axis and an external slope.

The staircase is located in a 3 m x 3 m space. Some marker points are posed at the corners of the delimited space.
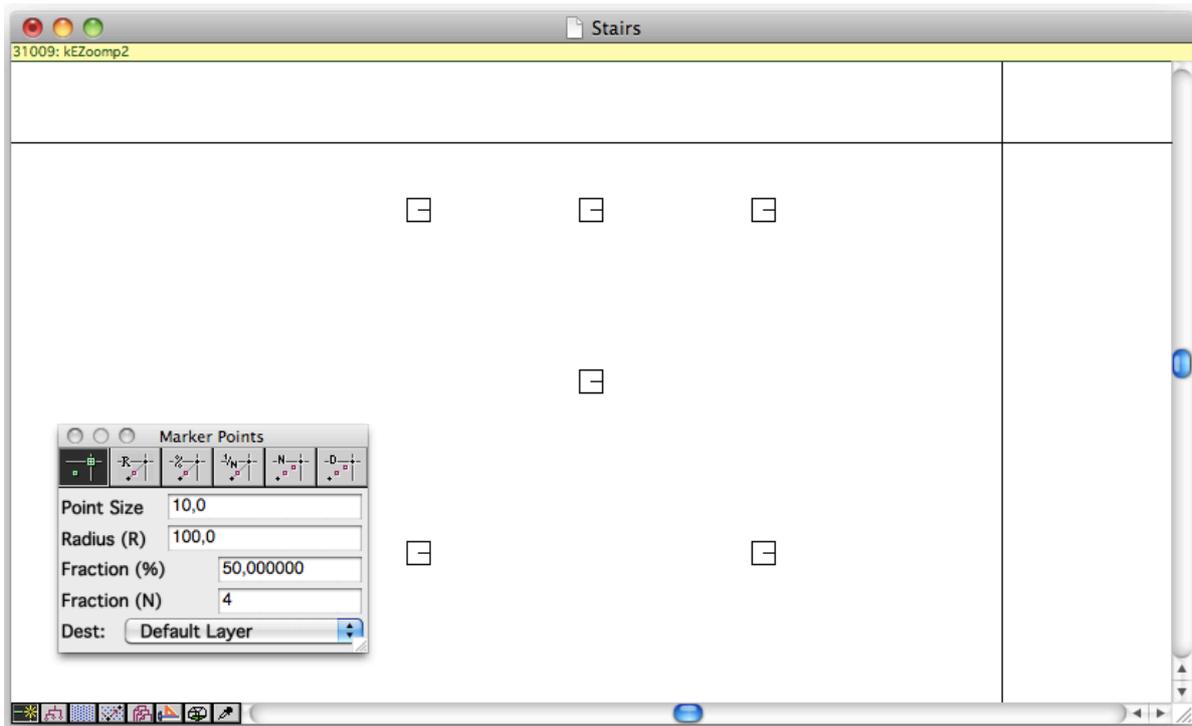
Then a stair step is defined in the bloc palette: width 1 m, height 20 cm, length 30 cm, orientation 0, slope 0
This first stair step is posed with the function "Place block"
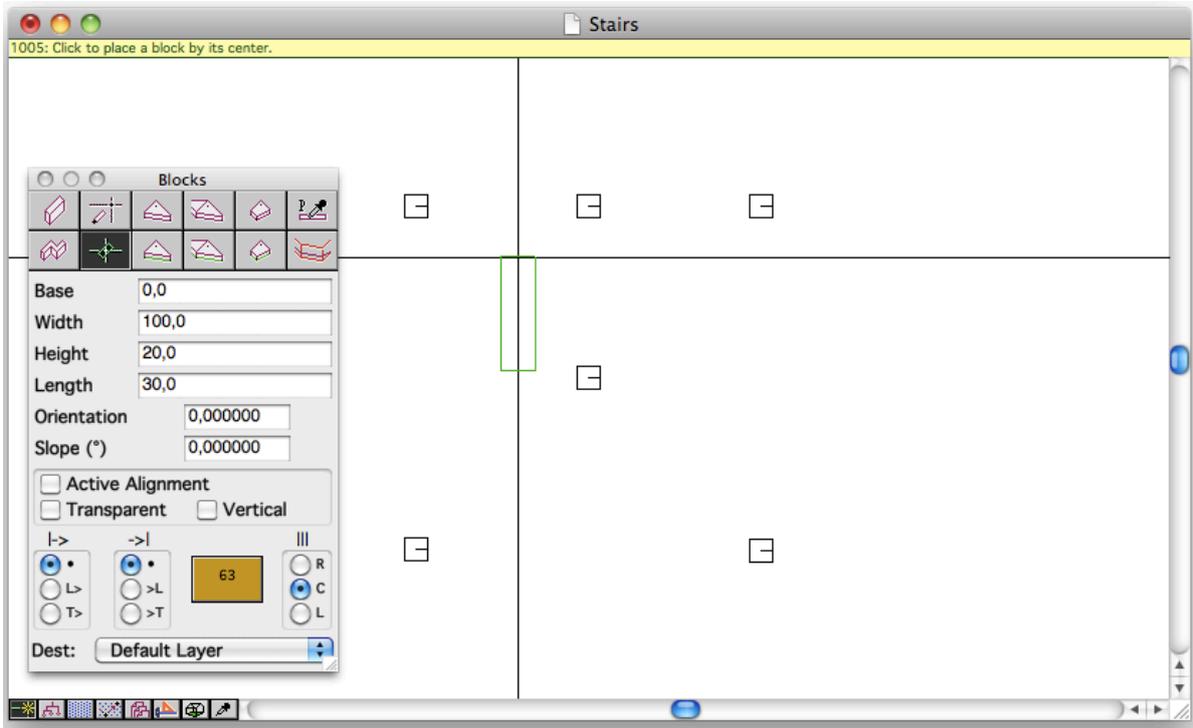
The stair step is posed by snaping:
- On a bottom point of the block
- The A key can be used to modify the snap point of the block
- On one of the marker points defined for the build of the stair
- The snaping should be activated (see the snap setup on the cursor position palette)
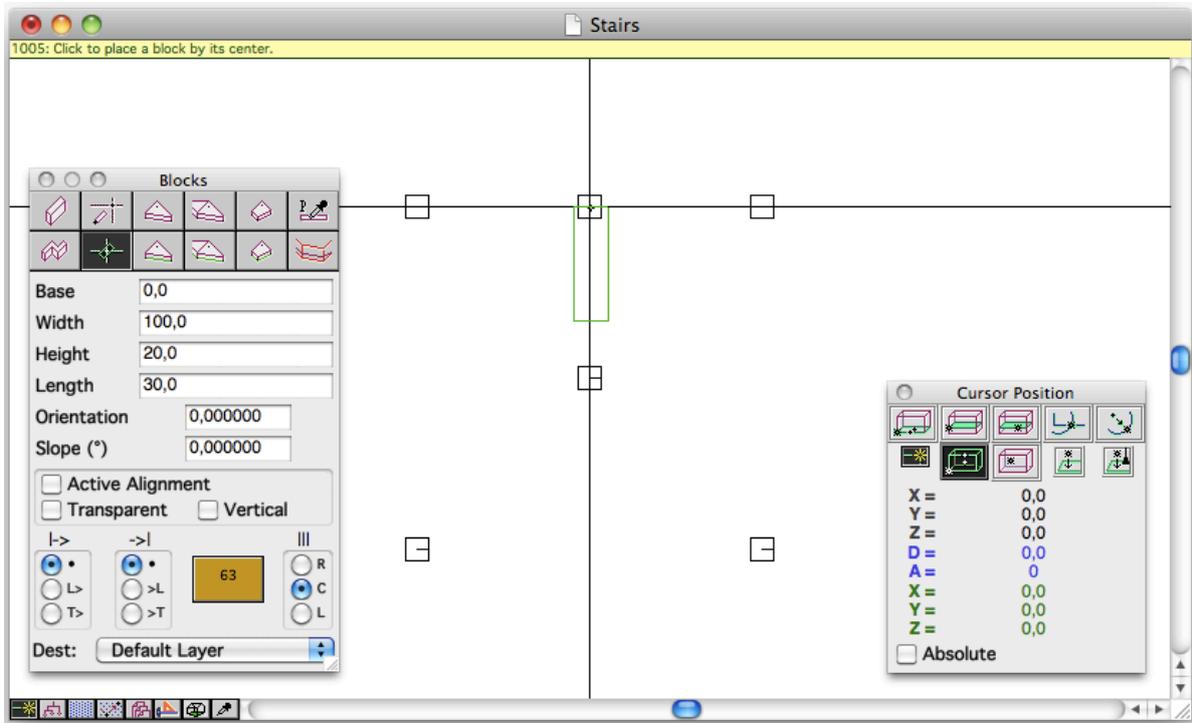
The other steps of the stair are build by using the "linked rotation" of the rotation palette. These parameters are chosen:
- Angle inc. 15° (12 x 15° = 180°)
- Base inc. 20 cm (height of a stair step)
- Height inc. 0
- Count 13 (12 + 1 = 13)
Why 13 steps rather than 12 ? The first and the last step are only counted as half of a 15° rotation.
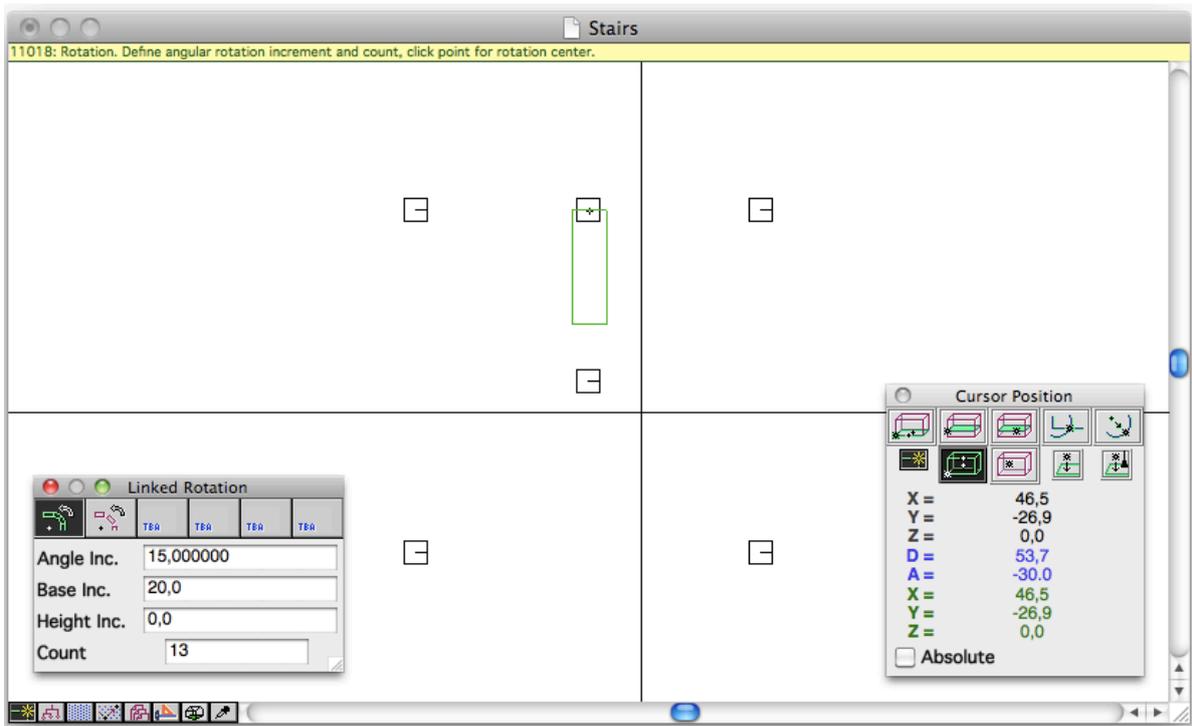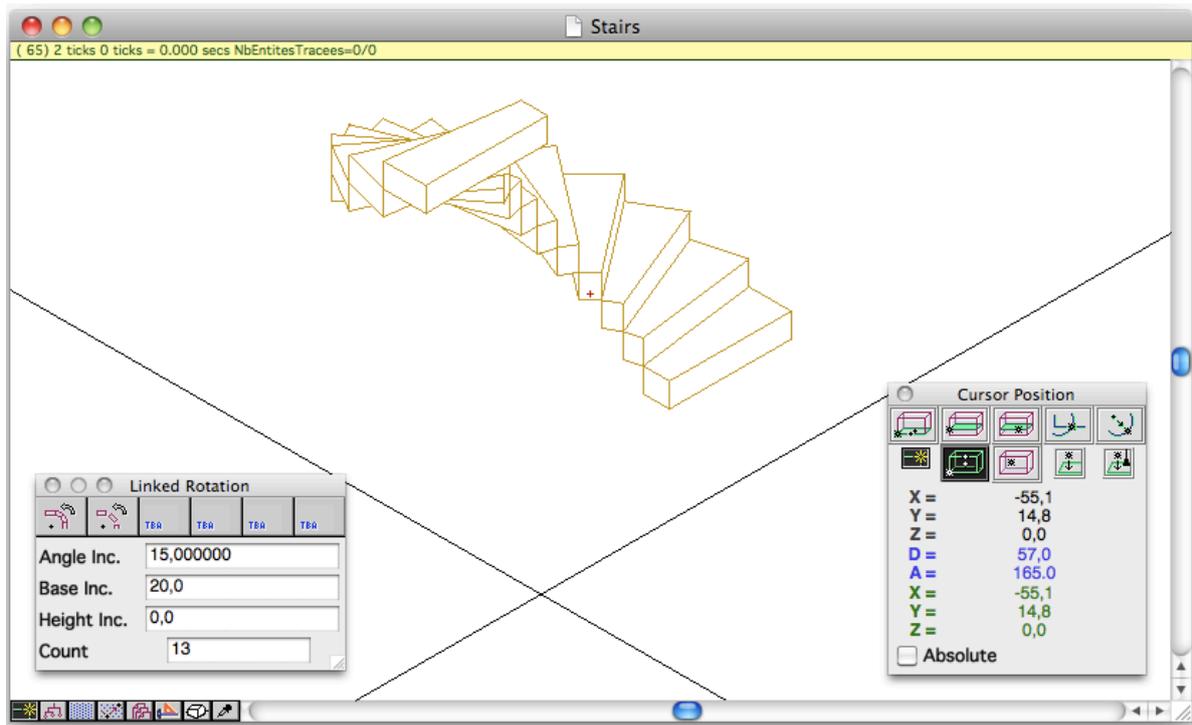
The rotation function is called:
- First clic on the rotation center
- Second clic on the first stair step
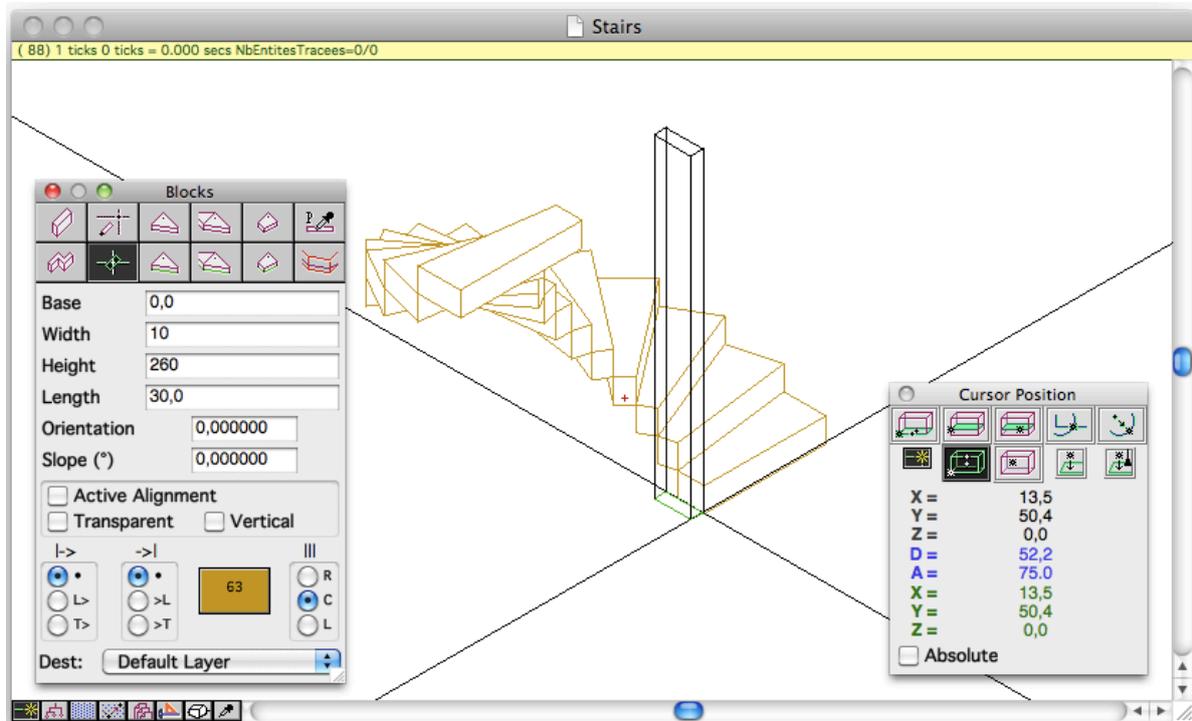The whole set of stair steps is now built
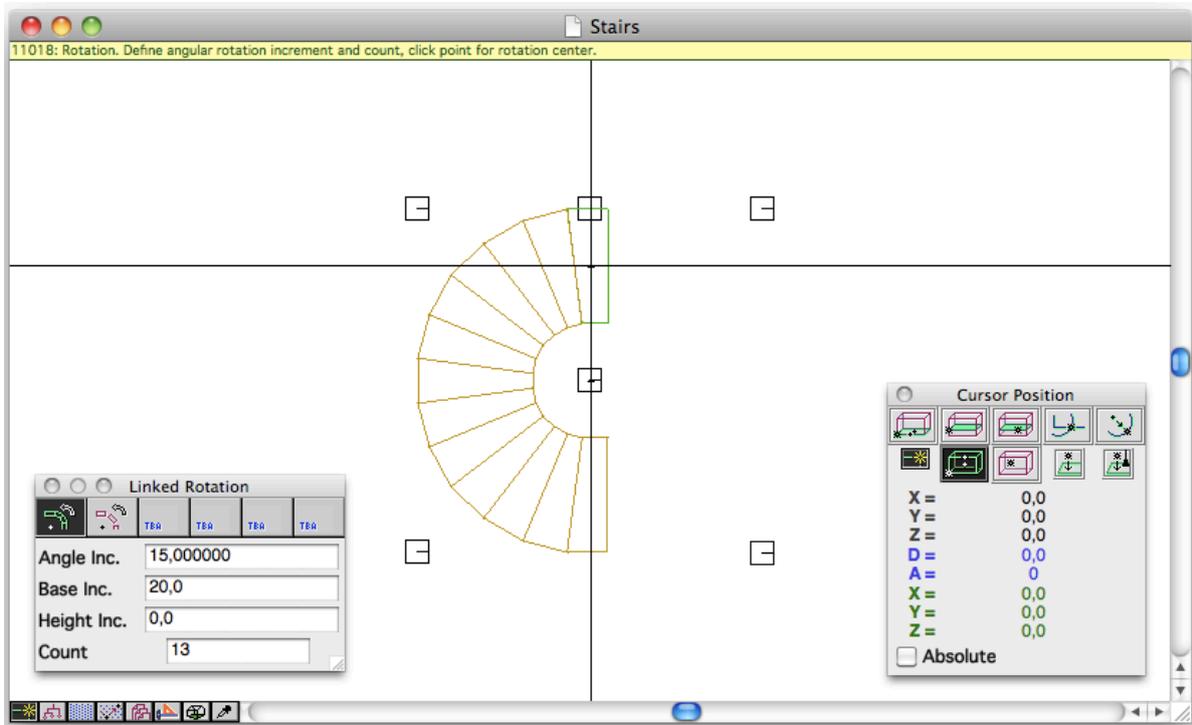
As visible in axonometric view (Cmd 4), the staircase appears like planed.
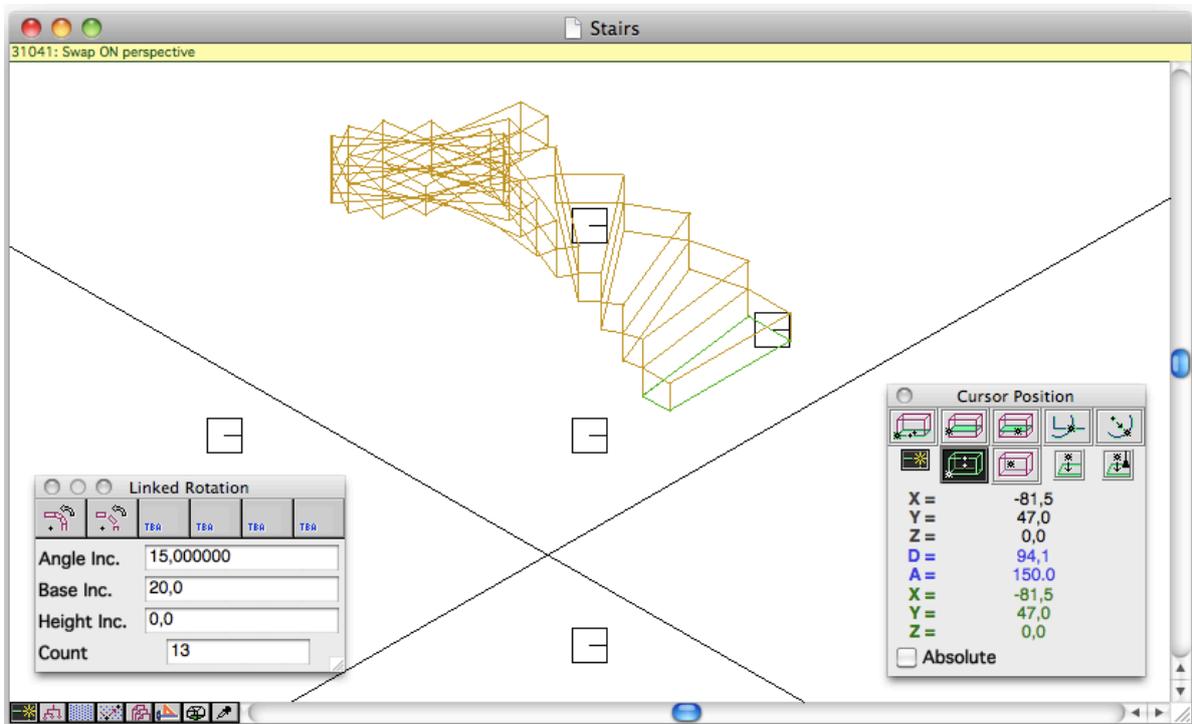
In order to build the central axis of the stair, a 2 m 60 height block is defined. This block will be put near the first step of the stair.
Parameters: width 10 cm, height 2 m 60, length 30 cm, orientation 0, slope 0

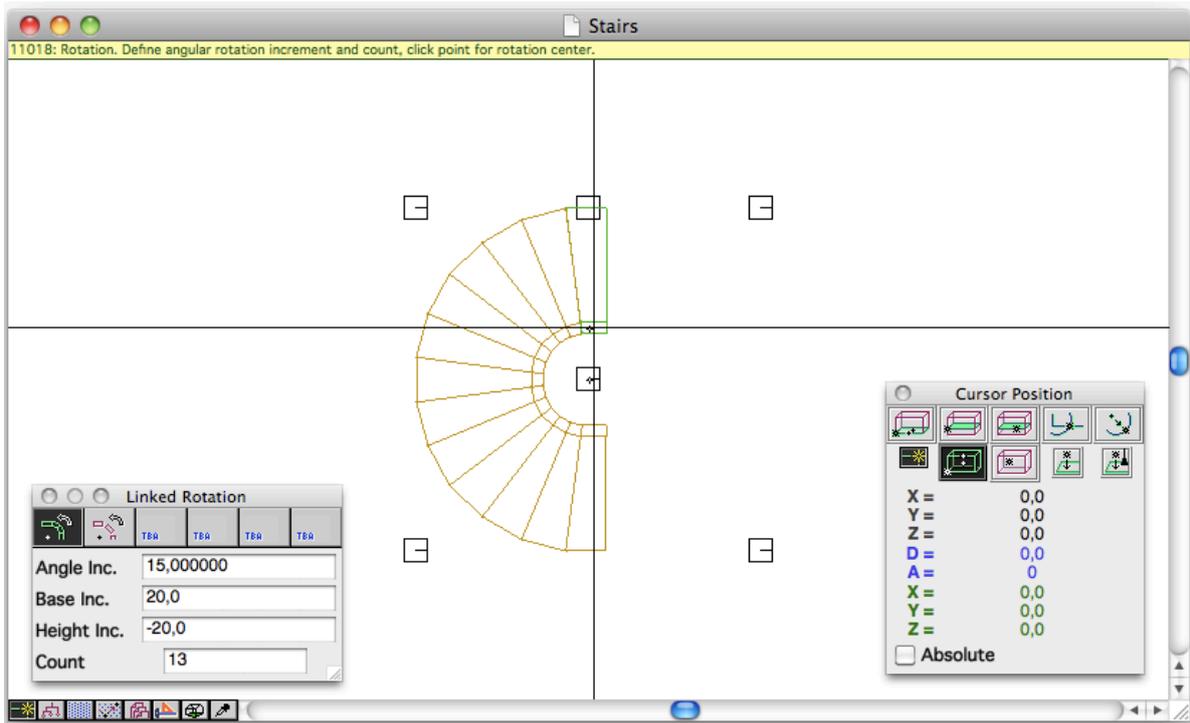The function "linked rotation" is used with this parameters:
- Angle inc. 15° (12 x 15° = 180°)
- Base inc. 20 cm
- Height inc. -20 cm
- Count 13
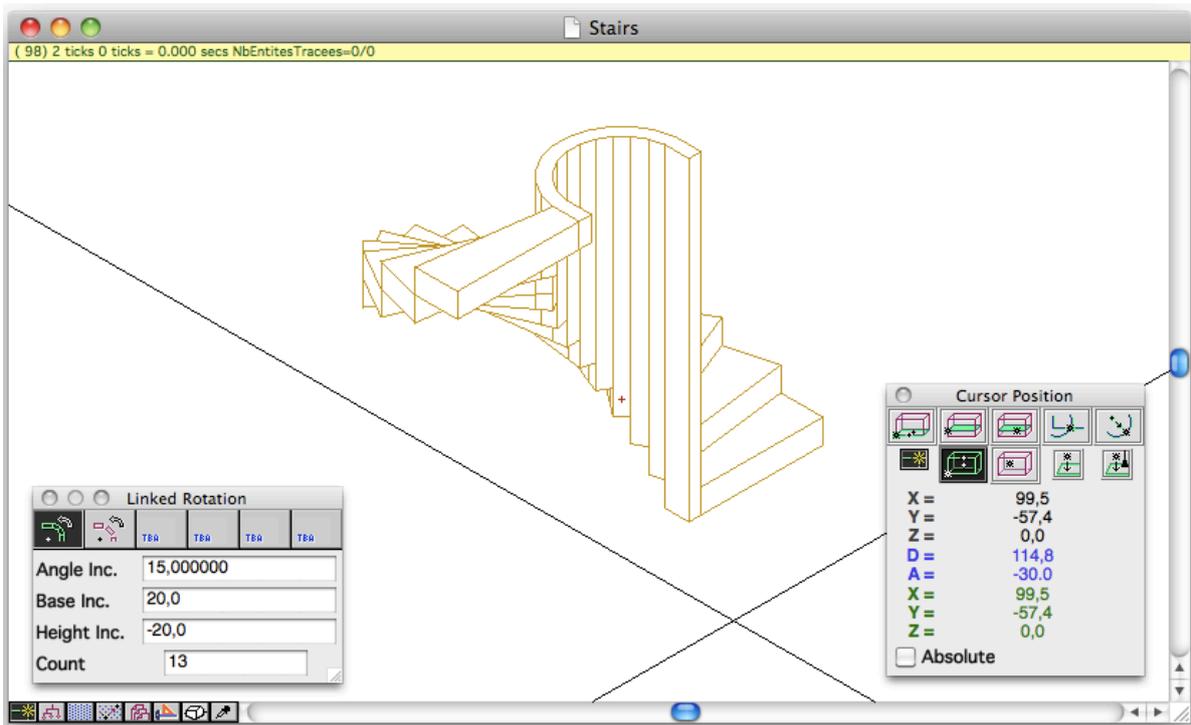These parameters are chosen to define a set of blocks of decreasing height.
The, the function "linked rotation" is called:
- First clic on the rotation center
- Second clic on the block previously posed
The axis of the stair is now built

The axis of the stair can be visualized in axonometric view

The slope is built starting from two blocks.
The first block is defined in the block palette with the parameters: width 10 cm, height 100 cm, length 10 cm, orientation 0, slope 0
The block is posed at the top of the first stair step. Doing this operation is easier in axonometric view.
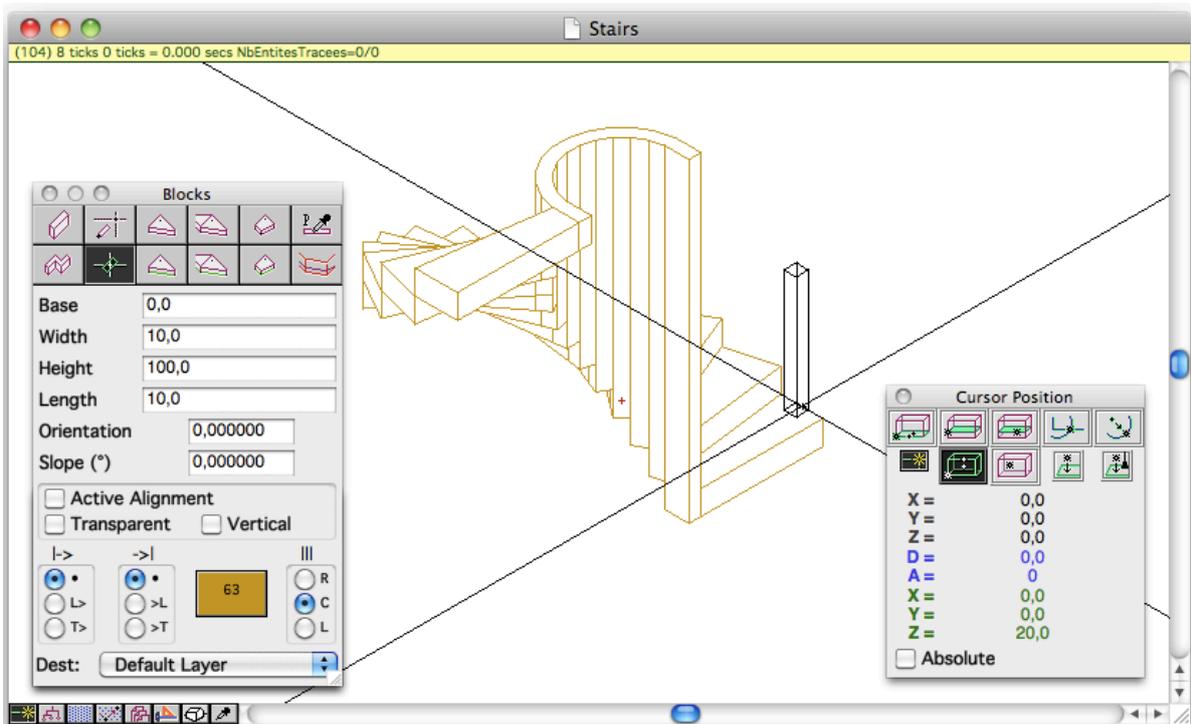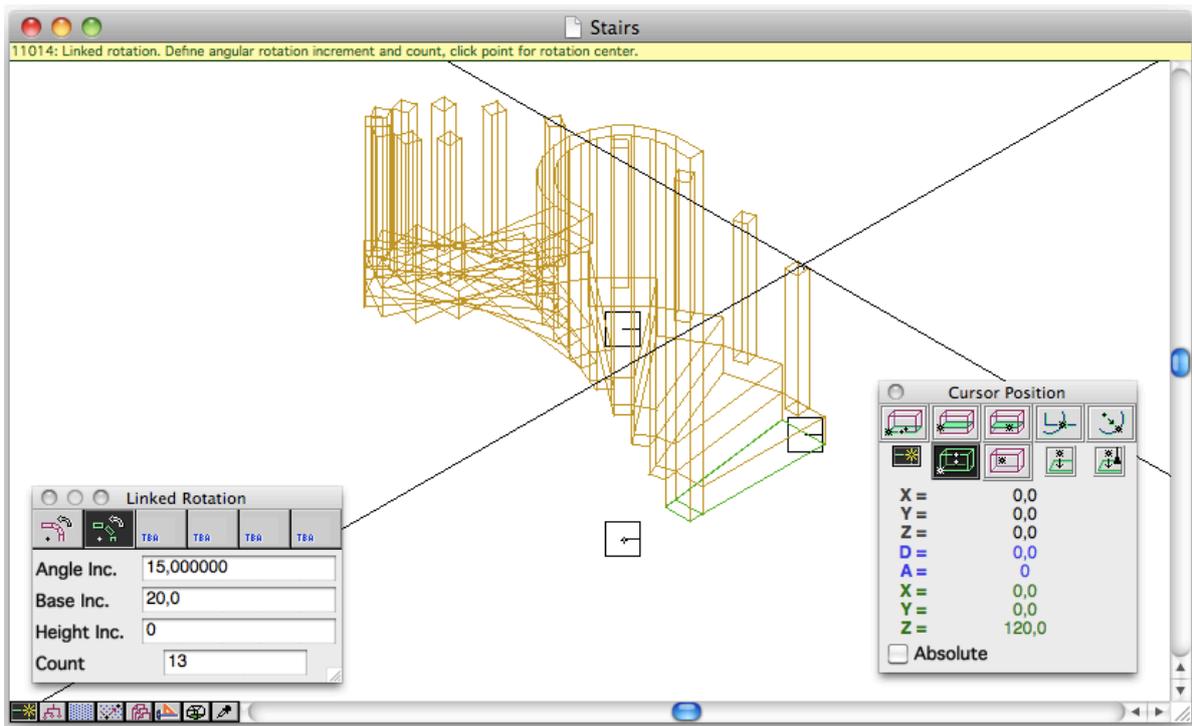
The function "rotation without link" is called with these parameters:
- Angle inc. 15°
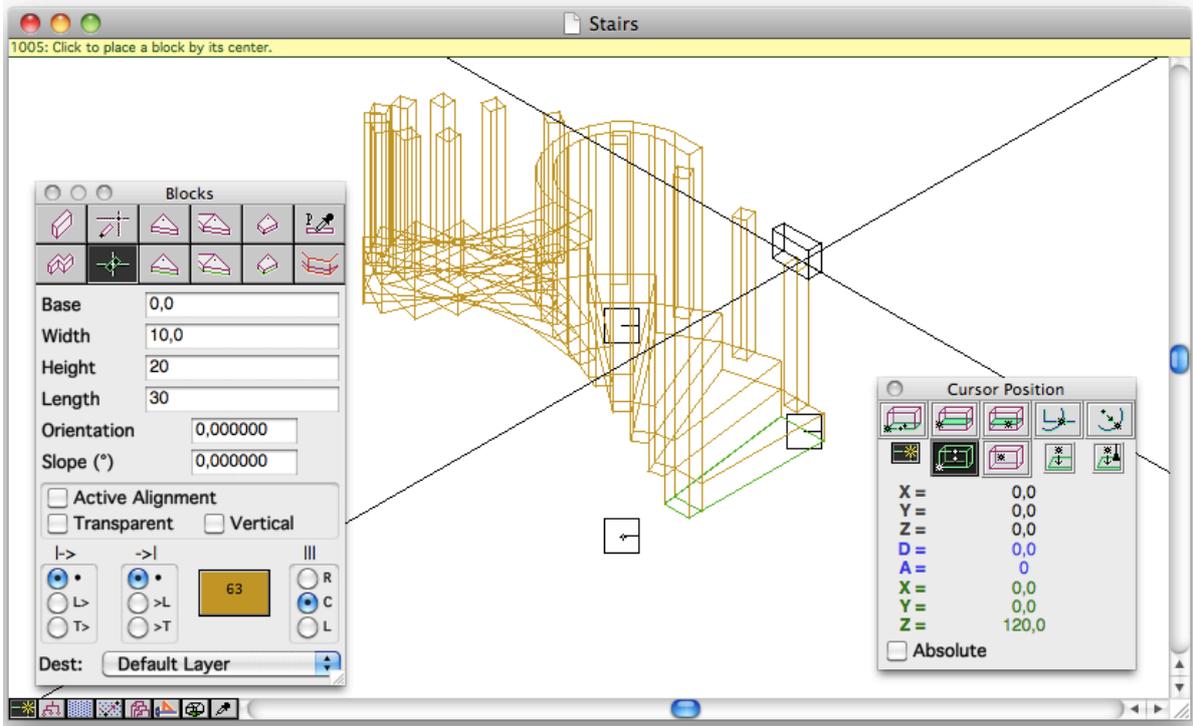- Base inc. 20 cm
- Height inc. 0
- Count 13
The function is called. It is easier to work in axonometric view when the function is called.
- First clic on the rotation center
- Second clic on the vertical block
The vertical bars of the stair are built.

Parameters of the second block of the external slope: width 10 cm, height 20 cm, length 30 cm, orientation 0, slope 0
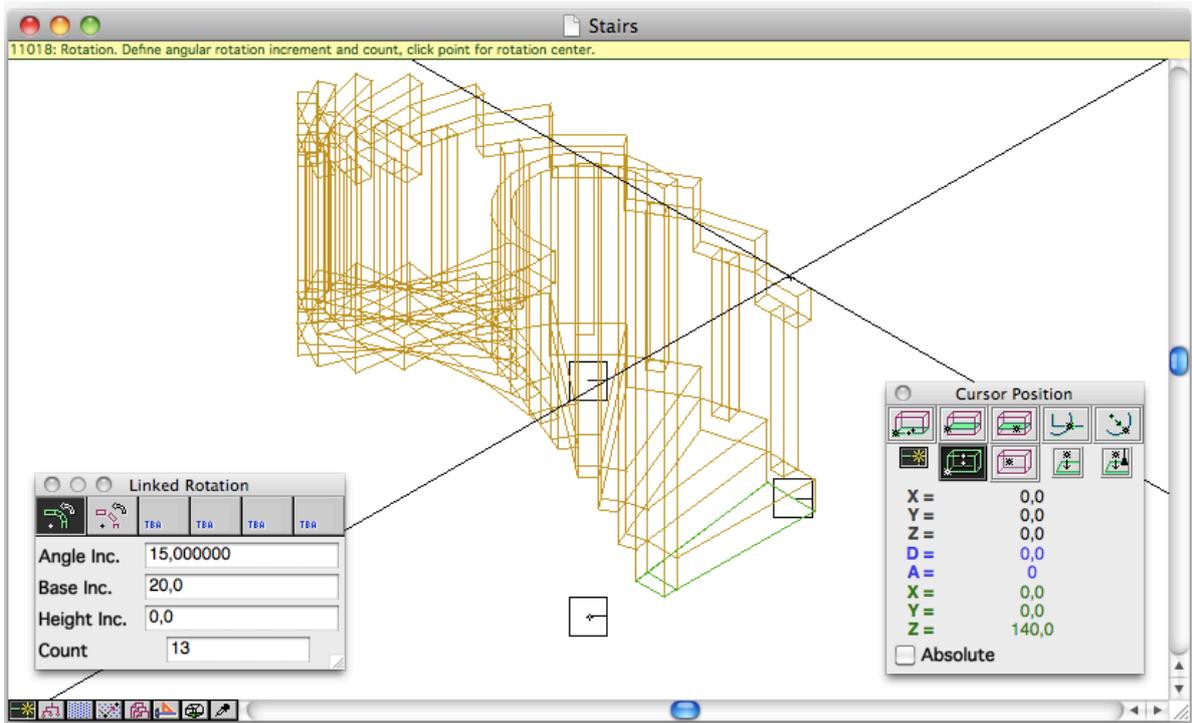The block is posed on the top of the first vertical bar of the stair.

The function "linked rotation" is called with these parameters:
- Angle inc. 15°
- Base inc. 20 cm
- Height inc. 0
- Count 13
The function "linked rotation" is called. Again, it's easier to work in axonometric view when the function is called:
- First clic on the rotation center
- Second clic on the last created block
The whole external slope is built (vertical bars and handrail)

The staircase is completed