MapPoint

Standard analytical function that calculates the best position of the dome knowing the telescope position is often insufficient. It is also very sensitive to the measurements accuracy of the telescope position relative to the geometric center of the dome. MapPoint procedure accurately helps to set the dome for the telescope. Its action is based on a list of manually pre-mapped points. By mapping we mean here to save the mutual position of the telescope and the dome. While mapping the dome must be manually set in the best position, so that the telescope optics was directed to the center of the dome windows.

There is no need to map the entire sphere. We map only those areas where standard procedure poorly sets the axis of the telescope dome. The minimum number of mapped points at which MapPoint function starts to work, is three points. MapPoint takes into account the position of the telescope relative to the pier (PierFlip - from version 3.0.0.3 ScopeDome USB Driver). We can save the best position of the dome while the telescope is set on a given point in both the eastern and western side of the pier. This is important especially when the telescope passes through the meridian around azimuth 180º.

How to start mapping the points?

1. In the "Config" window, "Telescope / Site Info" tab, please provide the exact coordinates of the observatory, and configure the connection with the telescope.
2. In the "Config" window, "Dome" tab, please choose the parameters as accurately as possible, "Dome Geometry" to let the standard procedure work as accurately as possible. This will allow us to map the minimum number of points. Standard procedure usually fails only near the zenith and the meridian.
3. In the "Config" window, "Program" tab, please select "Use Map Point" .
4. Then close the "Config" window by pressing "Save Settings".
5. Connect the dome with the telescope by pressing the "Conn" button in the "Telescope Command" group in the program main window.
6. We can now open the "Map Point" - for this purpose press the button "Map Point" in the main window.

MapPoints function window

After initial configuration described above we can generate a grid of points on which MapPoint function will calculate the position of the dome in relation to the telescope position. We have two possibilities:

1. Generate Flat Mesh - this option generates a flat grid of points for which the telescope position is equal to the position of the dome. Probably in this case there will be a need to map all the points of the grid.

2. Generete Dome Mesh - this option generates a grid of points on the basis of the standard procedure for calculating the position of the dome in relation to the telescope. Thus we can map only the places where the standard procedure fails, and the remaining points we left unchanged.

   To generate the grid points, respectively, press the button "Generate Flat Mesh" or "Generate Dome Mesh." We can also clean the mesh by pressing the "Clear Dome Mesh" and manually add all points to the grid.

Mapping the points

How to map points of the grid?

1. Select a single point on the graph by clicking in it.
2. Press the "Slew To" button in the "Scope Position" group - this will set the telescope to the coordinates of the corresponding point of the grid.
3. Press the "Slew To" button in the "Dome Position" group – this will move the dome to the azimuth corresponding to the point of the grid.
4. Correct manually (using the CW and CCW buttons from the main window) the position of the dome so the telescope optics was looking at the center of the dome shutter.
5. Press the "Map Point" button in the "Map Point" window.
6. Repeat this procedure for all points where the dome is badly positioned in relation to the telescope.
7. Manually mapped points are marked with a darker color.

Manually adding points

To add the point, set the telescope to any position and set the appropriate position of the dome, and then press the "Add" button in the "Points" group. "Delete" button deletes the selected point chosen by the mouse.

Before a full mapping of the dome we advise you to practice it at first on several points, and then clear the grid by pressing the "Clear Dome Mesh".

The quickest way to map points is to move on the grid by the columns from bottom to top. In this way we will do the least amount of dome moves.

Double-clicking on the grid moves the telescope to the coordinates indicated by the mouse.

You can enlarge the grid by selecting the area by the mouse.

The parameters of the MapPoint function

In the "Test" group, there are two parameters that determine the functioning of MapPoint:

1. "Acuracy" (degrees) - if the position of the telescope is located at a distance from the grid point less than the value of "Acuracy"- this point is selected.
2. "Radius" (degrees) - the radius where the algorym seeks the triangle points to calculate the position of the dome. If the points are not found, to determine the position of the dome it will use the standard algorithm. There is usually no need to change these parameters.

Saving mapped points

After the mapping procedure press "Save" button to save the list of mapped points permanently in the file. Question about saving a file with the points will also appear when you close the window "MapPoint".