en/WaypointGenerator/Panorama

51

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Inhaltsverzeichnis

1 Panorama....1/14

2 Introduction to the panorama....3/14

3 Example 1 - Single-row Panorama....4/14

4 Example 2 - Multi-row panorama....8/14

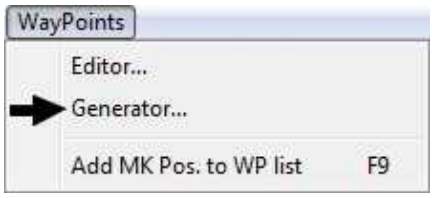
5 Settings to trigger the camera....11/14

6 The WayPoint-Flight....12/14

7 example panorama....14/14

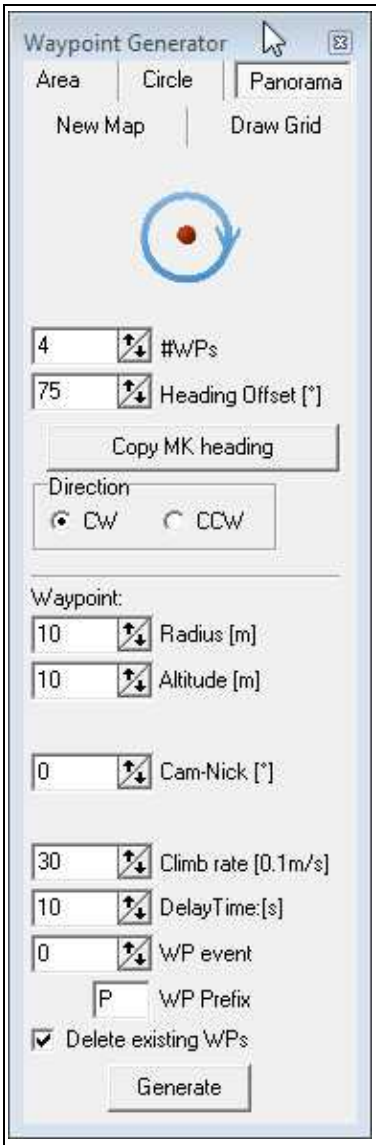
1 Panorama

Inside the **MikroKopter-OSD** you will get with a "click" on the tab **"WayPoints"** and on **"Generator..."** into the WayPoint-Generator.



Here now you can choose the tab **"Panorama"**.

Using the function "Panorama" you can take easily panoramas in the air.
Here you can preset settings, which are necessary for taking panoramas.
The Kopter will do so and will trigger the camera accordingly.



Description of the function:	
Panorama	
#WPs	Specifies the number of view directions in the circle (WPs) in which an image should be taken
Heading Offset [°]	Direction in which the first image should be taken
Copy MK heading	Takes over the "View Direction" of the Kopter as a start for the first image into the "Direction-offset".
Direction	Direction of rotation of the Kopter in which the WPs are flown (clockwise/counter-clockwise)
Waypoint	
Radius [m]	Radius around each WayPoint
Altitude [m]	Height of the WayPoint
Cam-Nick [°]	Tilt of the camera while reaching the WayPoint
Climb rate [0.1m/s]	Speed in which the Kopter climbs/falls between the WayPoints
Delay time [s]	Waiting time per WayPoint (View direction)
WP event	Here you can enter the trigger time for i.e. to trigger a camera
Delete existing WPs	Creating new WayPoints will delete existing WPs
Generate	Create(s) WayPoint(s) with the set values

2 Introduction to the panorama

There are different types of panoramas. These may consist out of one or more rows.
Simply explained multiple images are combined with an overlap to form a panorama.

To create a panorama out of different images you need to have an extra program.
Those are i.e. **"Hugin"**, **"PTGui"** or **"PanoramaStudio"**, just to name a few.
Information on those programs like creating a panorama and what must be considered can be found in the Internet.

- **HINT**
  In general the programs edit the individual images from left to right, clockwise.
  If you don't want to sort all images by hand it is advisable to take images in a clockwise direction.

3 Example 1 - Single-row Panorama

In this example we want to take a 360° Panorama with a height of 30mtr. The camera should point straight forward.
For example, here we want to use a lens with a focal length of 8mm and a viewing angle of 180°.
To have a sufficient overlap of the images, four images should be taken in a circle. Within a 360° circle is that a photo every 90°.

Step 1
First at all you need to mark the point in the map from where the Kopter should start to make the images.
Here you need to make a "Left-click" with the mouse on the appropriate spot on the map.

At this spot appears a marking point .

Step 2
For that reason that 4 images should be taken for the 360° Panorama the number must be entered under "WPs".

- **#WPs** = 4

Now you can set and enter the view direction for the first image which should be taken.
That has to be done here:

- **Heading Offset** [°] = 0

👍 **Hint**

- Here you can either enter a degree by yourself in which direction the Kopter should point for the first image,
  or you place the Kopter with the front into the desired direction of the first image and you "click" on **"Accept MK-Direction"**.
  The direction of the Kopter will be taken automatically into the "Heading Offset".

The direction in which the images are taken in a sequence can be entered under **"Direction"**.
Since the most of the Panorama-Programs handle images clockwise you need to choose **"CW"** (clockwise).

- **"Direction"** = CW

Step 3

Altogether there are four WayPoints (for the 4 images) superimposed. In order to take the images also during windy conditions the **"Radius [m]"** should not be too small.
If, for example, a radius of 1mtr. will be selected and a stronger wind is blowing out the copter from the position, it would turn first to the new direction. After that the Kopter would shoot more photos when it returns exactly (+/- 1mtr.) at the previous position.
However, that can be very difficult with stronger wind and it would need a long time.

We want to set here a radius of 10mtr.

- **"Radius [m]"** = 10

The Kopter should take the images out of a height of 30mtr. That will be entered under "Height".

- **"Altitude [m]"** = 30

For all photos the camera should point straight forward. For that reason the camera tilt will be entered with 0°.

- **"Camera tilt [°]"** = 0

The **Climb rate** can be ignored for the panorama scene in the same height.
If you want to take the photos in different heights you need to set the speed
in which the WayPoints should be flown at that specific height.

To get several images per view direction (not all images are sharp!) you need to set the Waiting Time per WayPoint and the WP-Event.

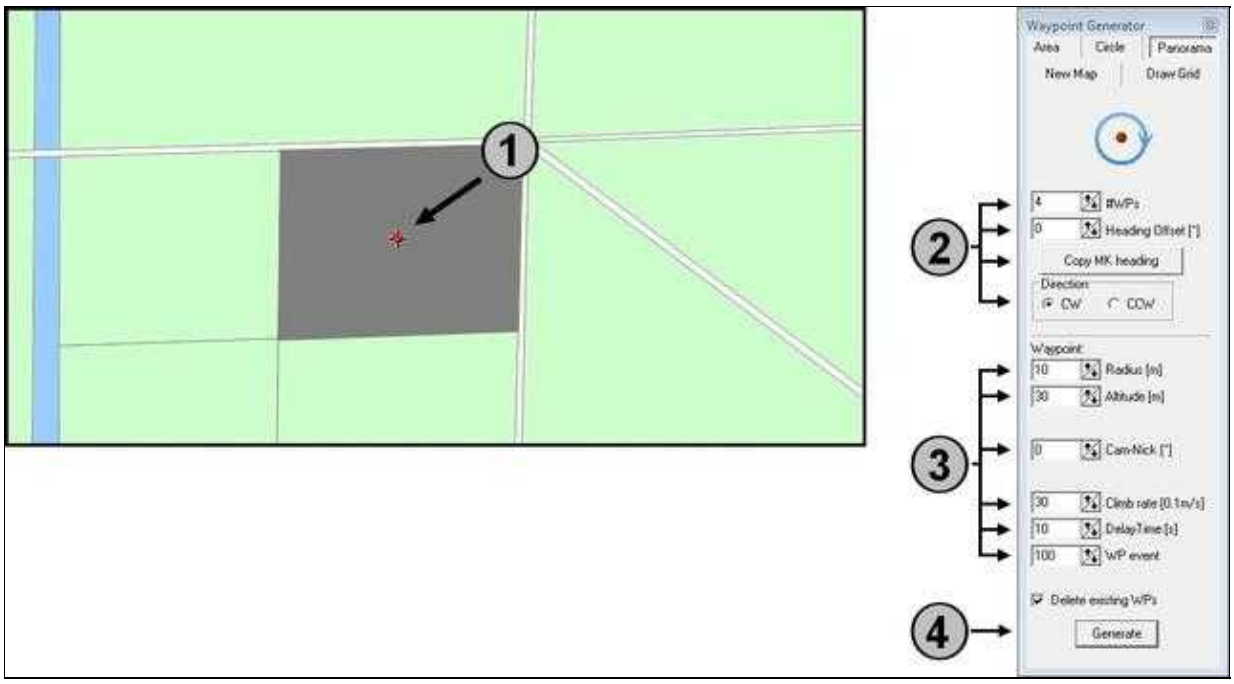
- **"Delay Time: [s]"** = 10
- **"WP event"** = 100

Step 4

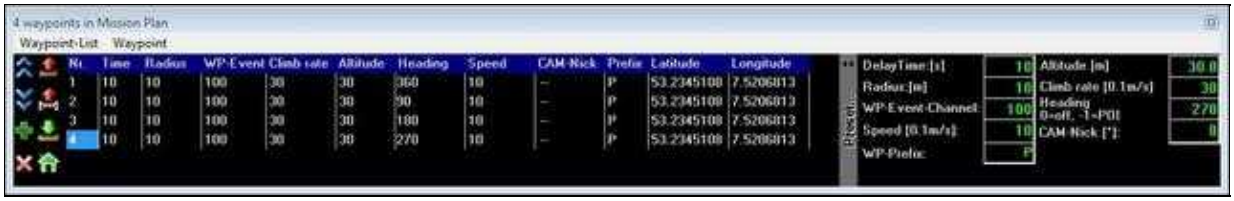
Those set up WayPoints must be created now. Here you just need to "click" on **"Generate"**.

- **Hint**
  Is **"Delete existing WPs"** marked, with each "click" on "Generate" already existing WayPoints on the map will be deleted.
  If you take off the checkmark you can place i.e. several WayPoints overlaped or at different places on the map.

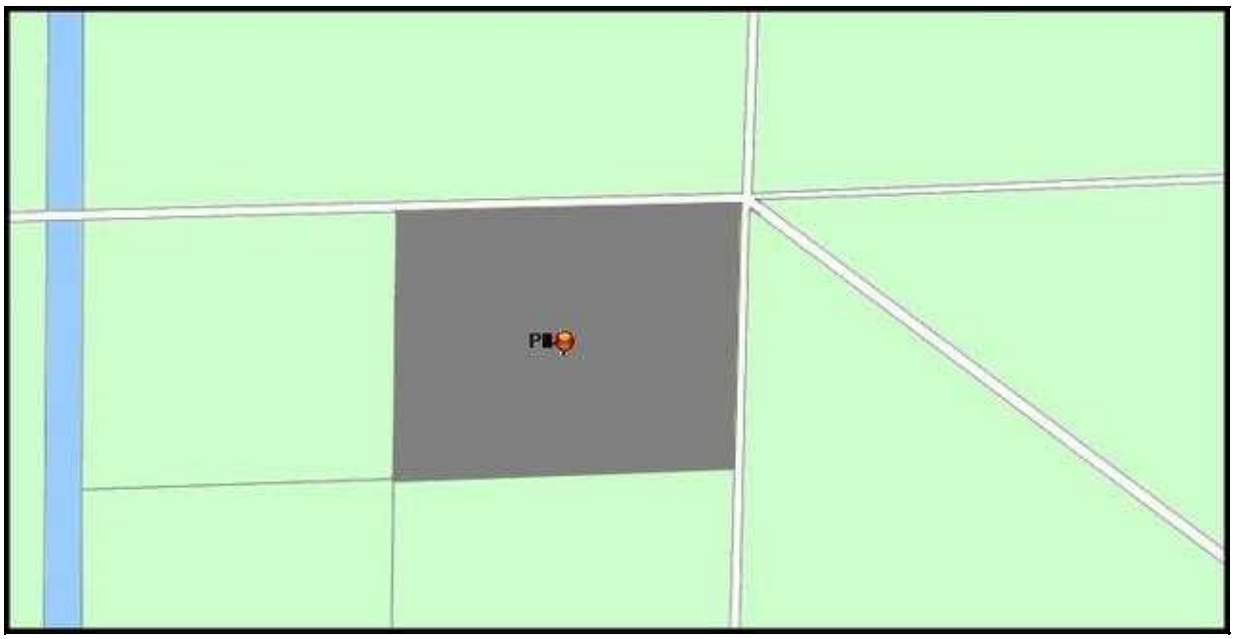
Example View:



After a "click" on the button **"Generate"** the WayPoints with the settings will be entered automatically into the **WayPoint-Editor**.
Under **"Heading"** you will see the alignment of the individual images:



After that the 4 WayPoints need to be entered into the map one above the other:



Now you can transfer the WayPoints to the Kopter and been flown. How this works is described under "The WayPoint-Flight".

4 Example 2 - Multi-row panorama

In this example we want to take also a 360° panorama out of a height of 30mtr.
Here, the camera should point first straight forward, then inclined 45° downwards and finally we want to take an image straight downwards.

Used will be for example a lens with a focal length of 8mm and a viewing angle of 180°.
To get a sufficient overlap of the images, 4 images should be taken per circle. With a 360° circle is that an image every 90°.

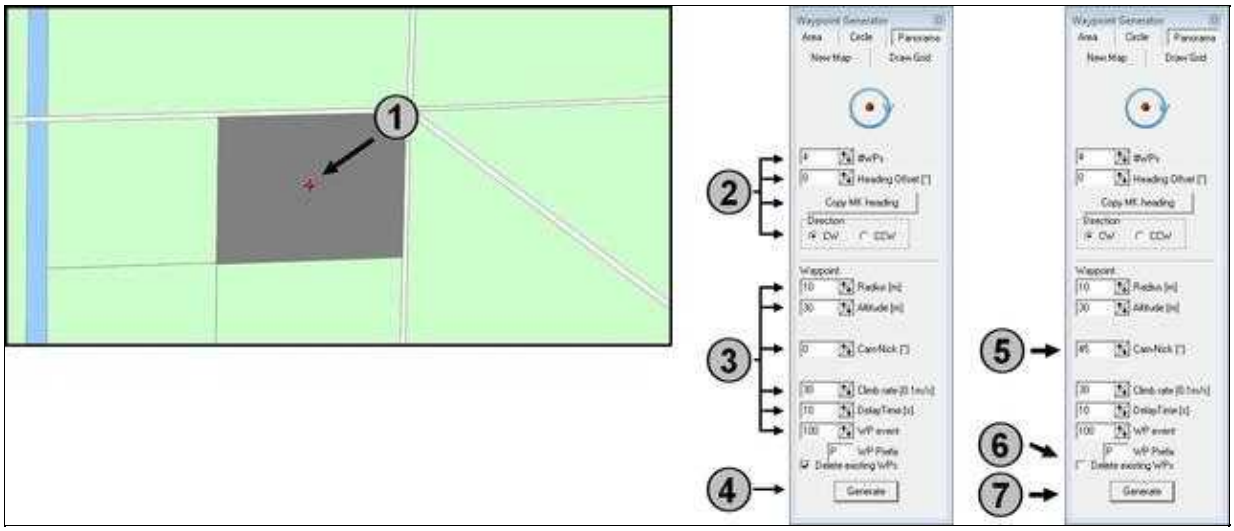
First Step
In the first step you need to make the settings in that way like described in **example 1**.
If you have transfered those first settings into the map you need to make only two different changes.

Second Step
In the "First Step" all was set for the first images with a view "straight forward".
So that the camera should take in the second round all images 45° inclined it need to be set under **"Camera tilt"**.

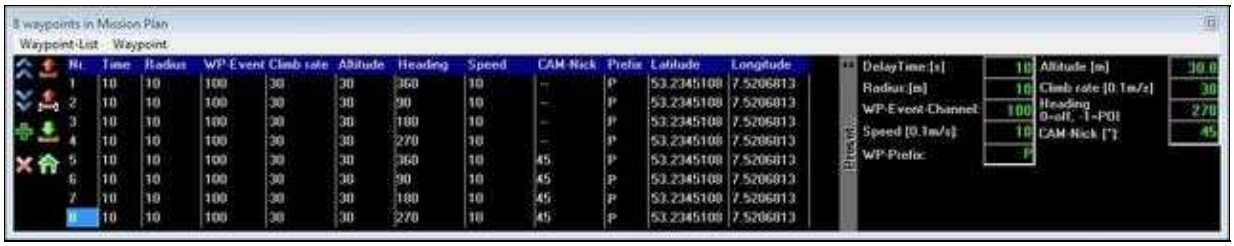
- **"Camera tilt** [°]**"** = 45

So that you get the following shots seamlessly after the first shots you need to remove the checkmark in "Delete existing WPs".

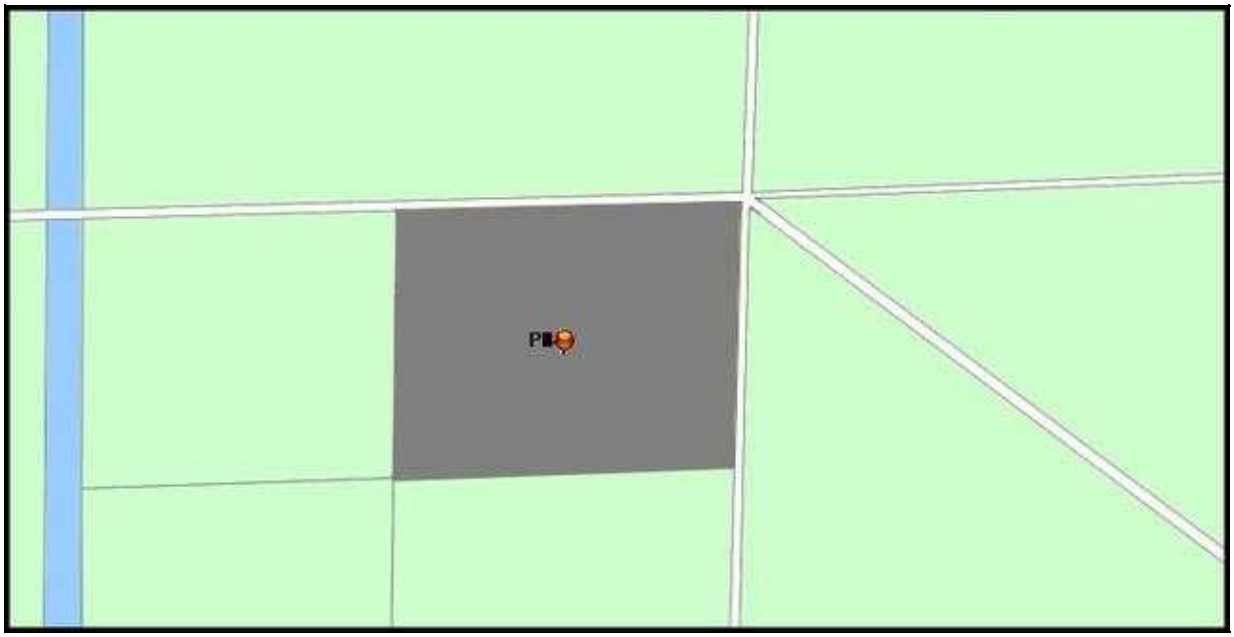
Those set up WayPoints you need to create now. Here you need to "click" on **"Generate"**.



After a "click" on "Generate" (4) the first WayPoints (No. 1-4) will be entered into the Editor.
Then, after changing the tilt (5) and removing the check mark in "Delete existing WPS" (6) and "clicking" again on "Generate" (7) the new WayPoints (No. 5-8) with the new tilt appears in the editor under the already existing ones:



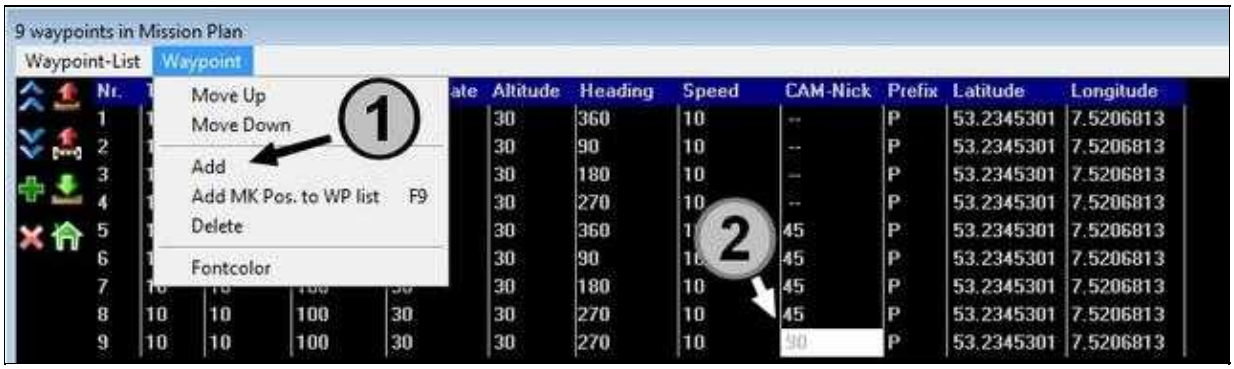
In the map the second panorama-entry will be placed over the existing one:



Third Step
In the last step we want set the camera in that way that it points for the last image straight downwards.

Here you can set in the **"WayPoint Editor"** a new WayPoint by yourself. Just "click" on **WayPoint** and **Add**.
This automatically creates a new WayPoint with the settings of the last WayPoint.

For the last WayPoint No.9 you just need to set a new camera tilt.
Continue with "click" on the entry **"45"** (45°) and open with the button **"F2"** the Editor.
Here now you need to enter the new camera tilt with **"90"** (90°) and just confirm it with **"Enter"**.



Now the WayPoints can be transferred to the Kopter and been flown. How that works is described under "The WayPoint-Flight".

5 Settings to trigger the camera

In our **Example 1+2** the camera was triggered per WayPoint. Here the time was set under **WP event**.

Those settings are described here: WP-Event Trigger camera

Alternatively the camera can be triggered continuously. Here you need to make two settings in the **KopterTool** under the tab **Outputs**.

Those settings are described here: Triggering camera permanently

6 The WayPoint-Flight

The settings are made and the WayPoints created.

In the next step the WayPoints will be transfered to the Kopter (See also: Transfer waypoints).
Bevor the start, the camera mount will be aligned in that way that the camera points straight forward (horizontally).

Now you can start the Kopter and "park" it in the air. Activate the function **"Hold Height"** and **"PositionHold"**.

So that the Kopter and the camera align itself (Kopter should show southward) you need to activate the function **"CareFree"**.

In order to start now the WayPoint-Flight the GPS-Switch must be set to **"ComingHome"**.
Directly after switching, the Kopter starts with the WayPoint-Flight.

Is the WayPoint-Flight done the Kopter stops at the last WayPoint. Now you can fly your Kopter back manually and land it.
You can set also the GPS-Switch to "OFF" and after that to "ComingHome". The Kopter will fly automatically back to the start-point.

7 example panorama

Here is an example of a panorama, that was made as shown in the example above.

With the left pressed button of your mouse you can move the panorama.

Please enable Javascript!