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2015-1-ES01-KA202-015925

Transnational Meeting no. 5 Sisak (Croatia)

Mission planning

Prepared by ZS10 Zabrze

Mission planning – Flight mode

Automated missions works, when you set AUTO mode in ArduPilot. In Mission Planner set switch to two modes: Auto and Loiter.

When you don’t want to fly in auto mode its good to have alt hold and stabilize mode.

(Before flight check the settings)

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Mission planning – First automatic mission

To check the auto mode try to do very simple mission in shape of square.

First automatic mission: only waypoints without start and landing. Operator starts the dron and changes flight mode in the air. After the mission operator lands.

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Mission planning – Regular automatic mission

Dron will fly without participation of men.

Mission should contain: taking off, flight, coming back and landing.

Operator only puts throttle up and dron starts.

Dron should be placed in home position (check on the map)

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Mission planning

Use Mission Planner to plan flight.

It is not necessary to connect drone to computer. It works off-line

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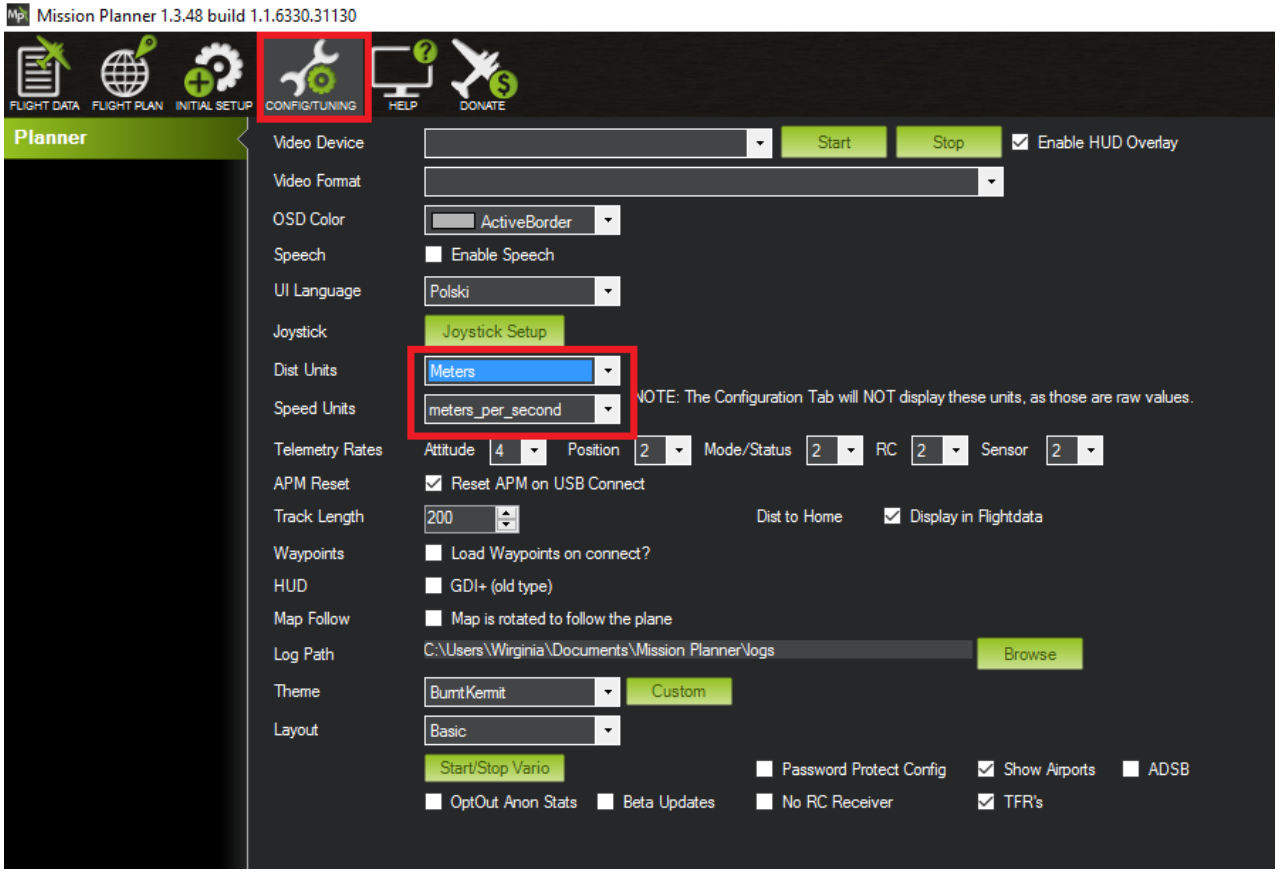
STEP 1: Check units length [m] and speed [m/s]

Menu config/tunning

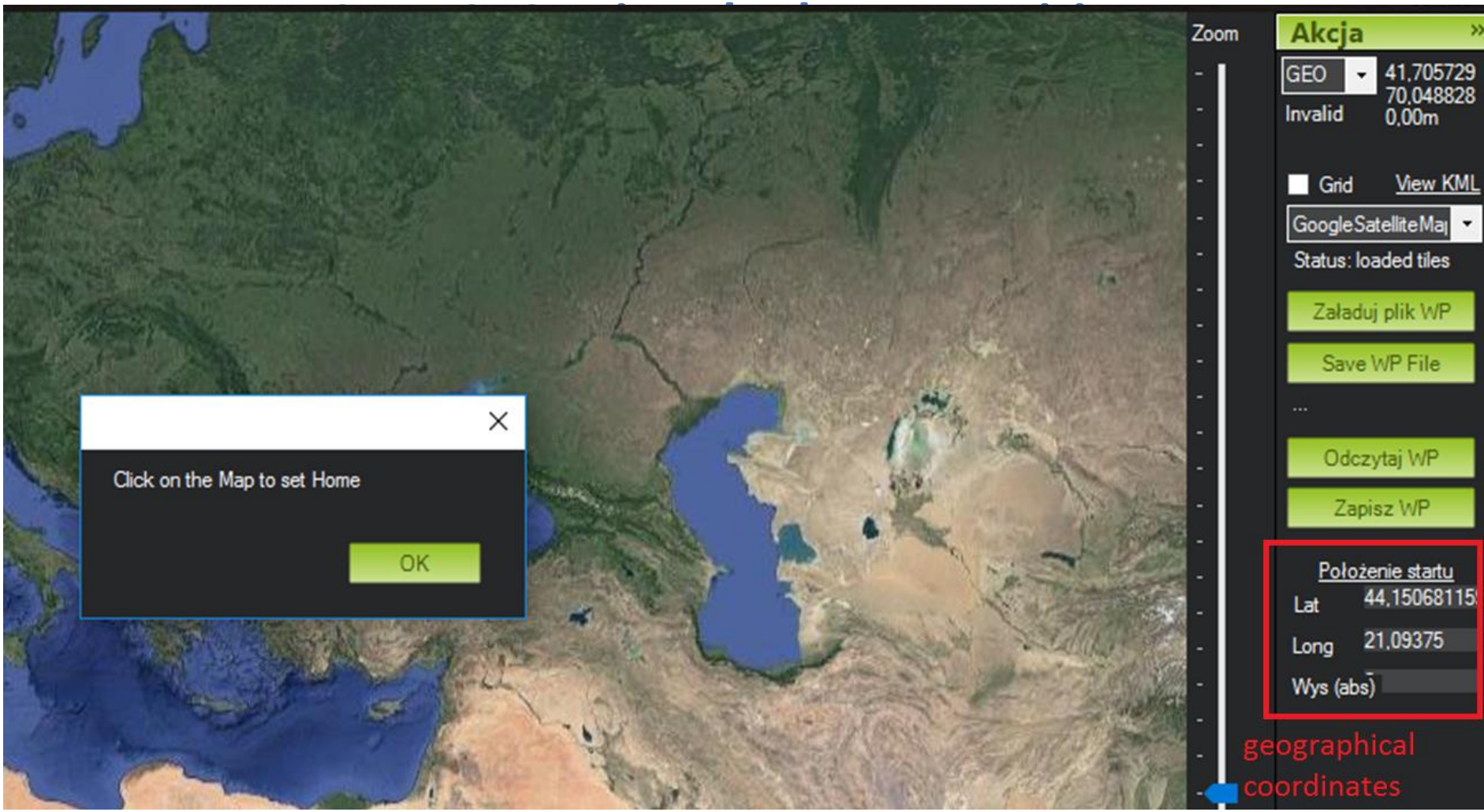


STEP 2: Setting the home position

On FlightPlan panel find the place where you want to fligt.
First you can check the coordinates using internet or other aplication with GPS

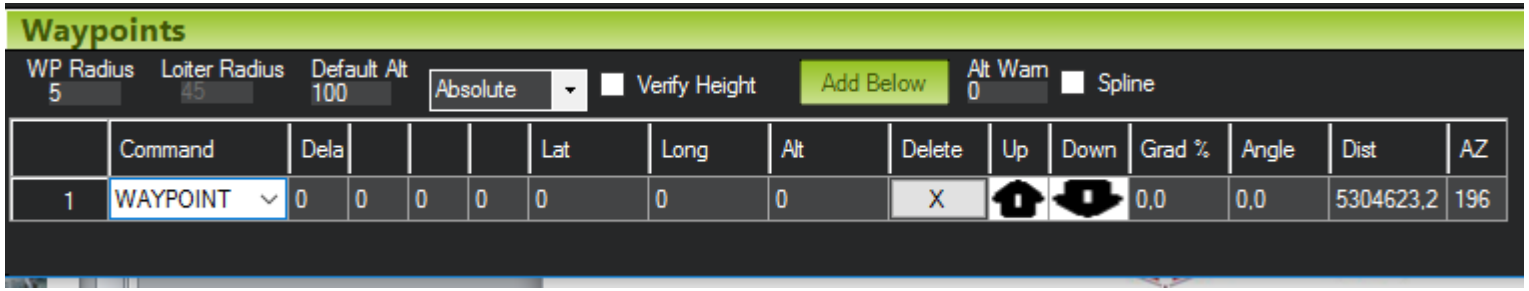
School in Sisak is: 16,3836085796356
45,4587685487451

When you launch drone its position will be on the map


Zoom
Akcja
GEO
41,705729
70,048828
Invalid
0,00m
Grid
View KML
GoogleSatelliteMap
Status: loaded tiles
Załaduj plik WP
Save WP File
...
Odczytaj WP
Zapisz WP
Położenie startu
Lat
44,15068115
Long
21,09375
Wys (abs)
Click on the Map to set Home
OK
geographical
coordinates

STEP 3: Taking off

Planning the mission is adding waypoints to the list of tasks. Click the bottom **Add Below**. Each waypoint can be changed. The first one should be **TAKE OFF**



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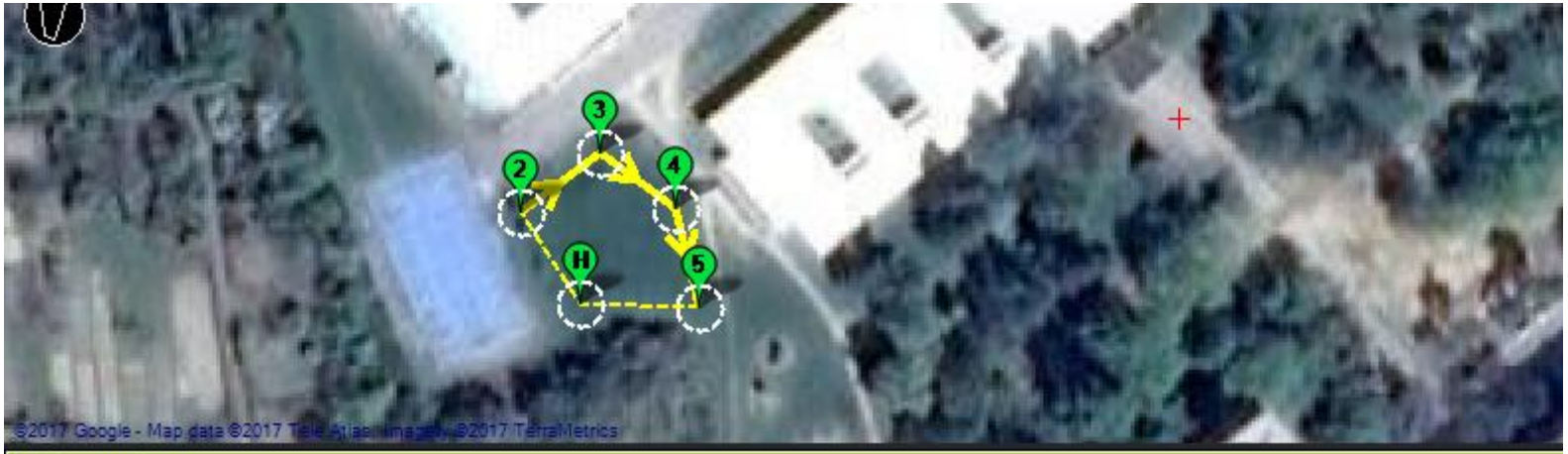
STEP 3: Taking off

STEP 4: Planning the flight

Click on the map to add next waitpoints



Waypoints

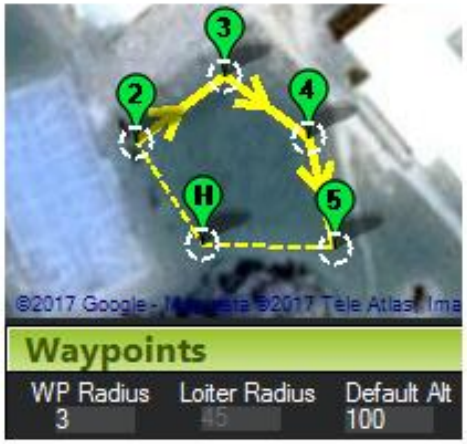
WP Radius 5 | Loiter Radius 45 | Default Alt 100 | Absolute | Verify Height | Add Below | Alt Warn 0 | Spline

	Command	Dela				Lat	Long	Alt	Delete	Up	Down	Grad %	Angle	Dist	AZ
1	TAKEOFF	0	0	0	0	0	0	100	X			0,0	0,0	5304623,2	196
2	WAYPOINT	0	0	0	0	45,4589793	16,3835979	100	X			-18,6	-10,5	23,4	327
3	WAYPOINT	0	0	0	0	45,4590921	16,3838124	100	X			0,0	0,0	20,9	53
4	WAYPOINT	0	0	0	0	45,4589868	16,3840163	100	X			0,0	0,0	19,7	126
5	WAYPOINT	0	0	0	0	45,4587987	16,3840806	100	X			0,0	0,0	21,5	167

STEP 4: Planning the flight – WP Radius

WP Radius is the radius of circle, when drone is inside this area flight contoler confirm that point and go to the next place.

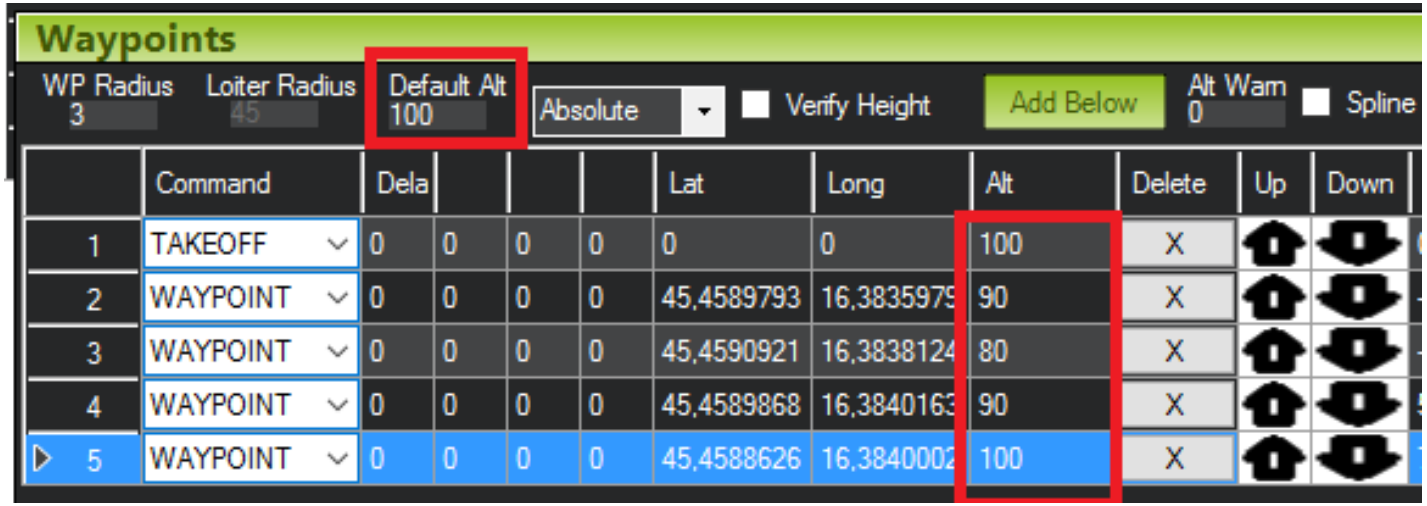
Incorrect



Correct

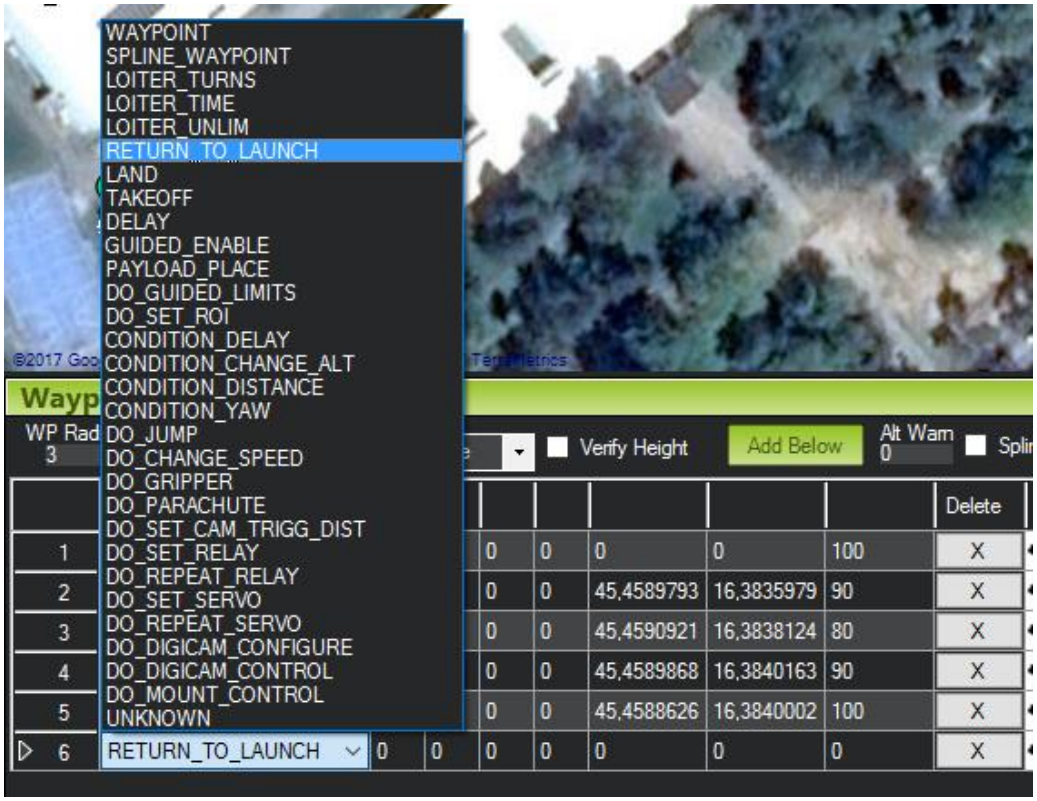
STEP 4: Planning the flight – Default alt

Default Alt is the default altitude when entering new waypoints.
100 m is very high so be carefull about this number.
Each waypoint has alt, which can be changed



STEP 5: Returning to home

The next waypoint is RETURN_TO_LAUNCH. The drone after the mission come back to home position, but is still above the ground



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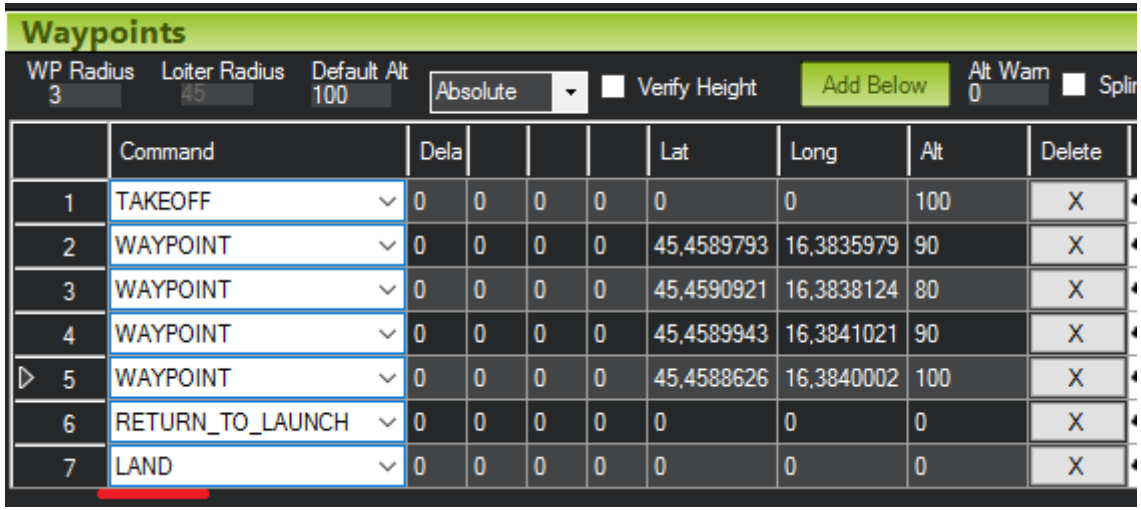
STEP 6: Landing

To put gently the drone to the ground add Waypoint LAND



	Command	Dela				Lat	Long	Alt	Delete
1	TAKEOFF	0	0	0	0	0	0	100	X
2	WAYPOINT	0	0	0	0	45,4589793	16,3835979	90	X
3	WAYPOINT	0	0	0	0	45,4590921	16,3838124	80	X
4	WAYPOINT	0	0	0	0	45,4589943	16,3841021	90	X
5	WAYPOINT	0	0	0	0	45,4588626	16,3840002	100	X
6	RETURN_TO_LAUNCH	0	0	0	0	0	0	0	X
7	LAND	0	0	0	0	0	0	0	X

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STEP 6: Saving the mission

Now you can save the file.
The most important is to load mission to drone.

Connect the drone to PC and click **Write WPs**

STEP 7: Before the flight – the compass line

Prepare drone to the flight – check with your list

Place the drone near home point (check on the map)
The line from compass should be in good direction.
There can be 15 degrees difference.

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STEP 7: Before the flight – the compass line

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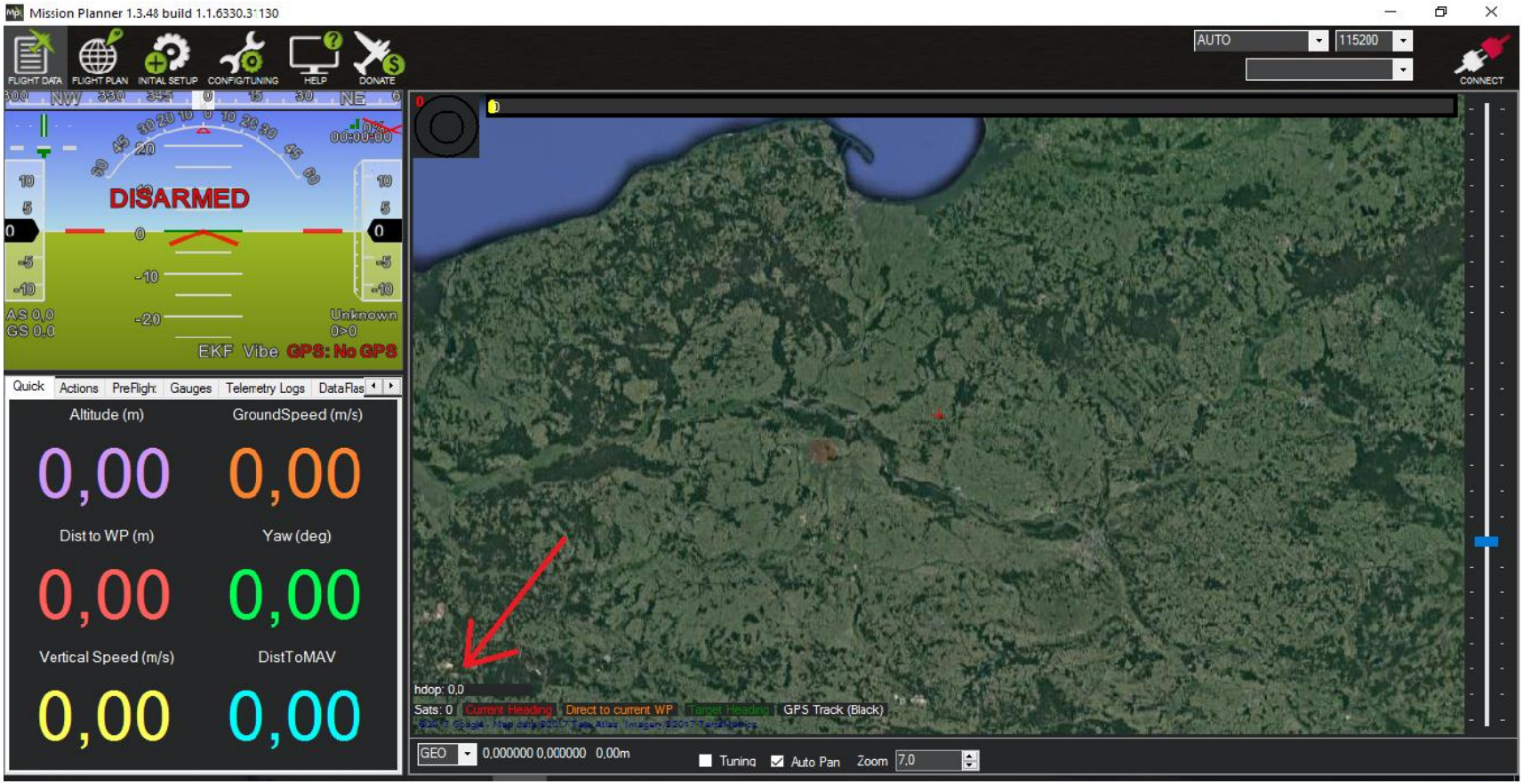
STEP 7: Before the flight – number of satelites and hdop

The minimum number of satelits the dron should see is 6. In practis fly, when you have 8 or more

Hdop is another important number. It should be really low: max is 2.5

STEP 7: Before the flight – number of satelites and hdop



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STEP 8: Flight

Armed the drone.
Switch to Auto mode
Put the trottle up.
Dron should start making mission