



Seafloor™

AutoNav

Quick Start Guide

Using Mission Planner Application



Autonomous Wayfinding System for Unmanned Surface Vessels

Overview

The AutoNav Autopilot System and the Mission Planner Application run on a base station laptop, connected through a radio telemetry link. It displays the vessel's geographical positioning and progress against a background map of the survey area.

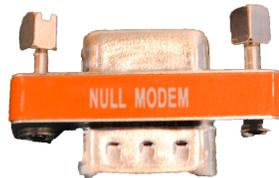
This Quick Start Guide provides setup instructions for the AutoNav, Taranis QX7 Remote Control System, and the Mission Planner Application. With this guide, users will:

1. Establish both remote control and autonomous mission planning for a Seafloor USV
2. Plot and adjust cross sections
3. Learn proper sequencing and best practices

Essential to Operation

Items to include in your kit: These items are not provided by Seafloor, as they vary based on the user's smart antenna specifications.*

1. Null Modem



2. Serial Gender Changer

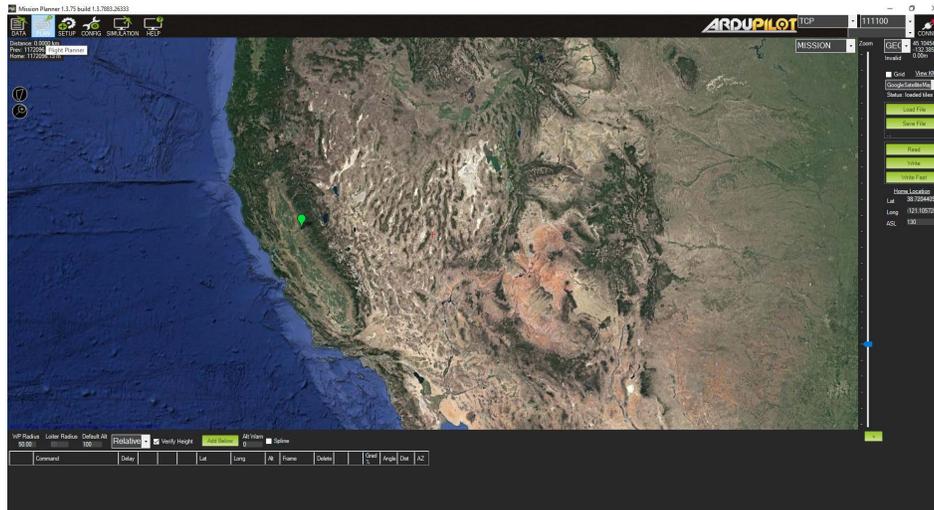


Setup

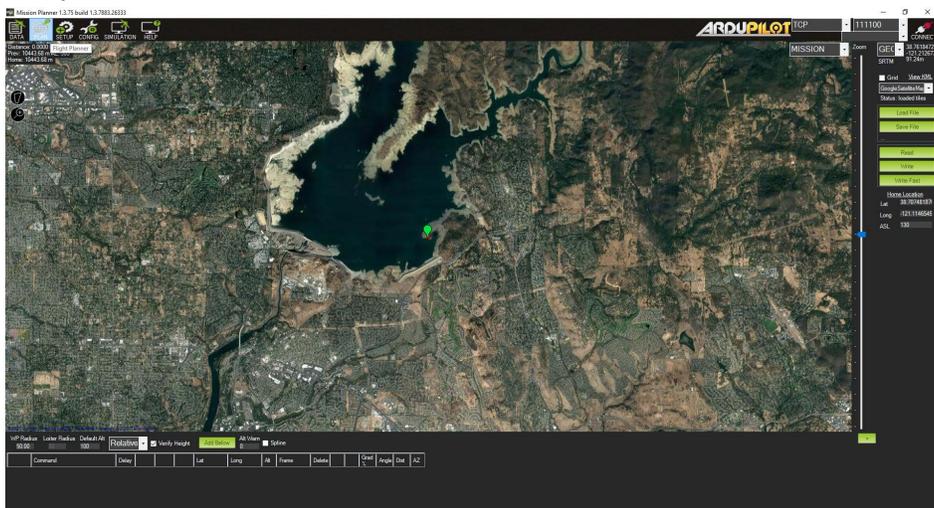
- 1) Turn on Taranis remote (refer to Taranis Manual).
 - a) Sticks should ALWAYS be centered or “Neutral” during set-up/configuration.
- 2) Attach USB radio link to the shore computer.
- 3) Flip switch to turn AutoNav on, you will hear start up tones.
- 4) Turn on HyDrone pontoons or EchoBoat thruster switches, ensuring sticks on Taranis remote are centered while doing so.
 - a) Both HyDrone pontoons or EchoBoat thrusters should emit a “beeping” noise at this time.
- 5) Arm AutoNav by holding Arming Safety Switch.
 - a) You will hear an arming tone from the AutoNav box.
- 6) Both thrusters should now respond when you move the right joystick forward.
- 7) With the Mission Planner Software open, press **decline all updates, allow parameters to load**.
- 8) Click CONNECT in Mission Planner on the control bar (top right). Verify correct COM port, Radio Link 57600 Baud Rate, USB cable 115200 Baud Rate. (You **MUST** be Disarmed to connect)
- 9) Allow parameters to load, decline any updates.
- 10) Within the top left portion of the “Flight Data” tab, you may see an inscription **GPS: No GPS**
- 11) A NMEA string will be needed for positioning purposes.
 - a) Receiver must have RS232 input, RS232 to Amphenol cable provided by Seafloor Systems.
 - i) Gender changer and/or Null modem may also be needed.
 - b) Select Port 2 and add NMEA GGA and NMEA RMC, both at 5hz. It needs 38,400 baud rate
 - c) Ensure that “\$GP Identifier” is turned on, in the same area as RMC, GGA string NMEAs
- 12) If using an EchoBoat with Dual Antennas for Heading, you will also need HDT NMEA String.
- 13) Once the string is successfully added: the top left portion of the “flight plan” tab will show **GPS: 3D Fix or 3D DGPS, etc.**
- 14) You can check the accuracy of your position on the map, as well as turn the boat 90 degrees to validate that your heading is updated in real time. These are great checks to do before heading into the field.

Mission Planning

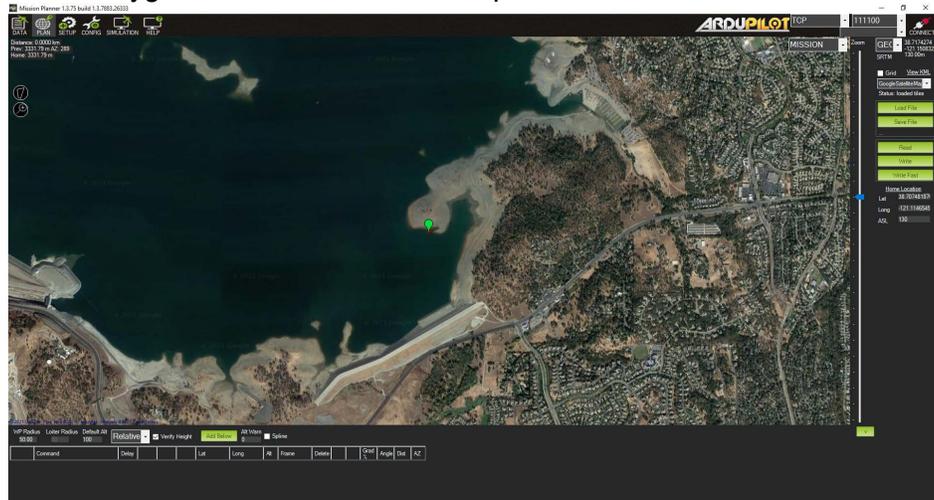
1. Click FLIGHT PLAN in Mission Planner on the control bar.



2. Find your survey area on the satellite map.

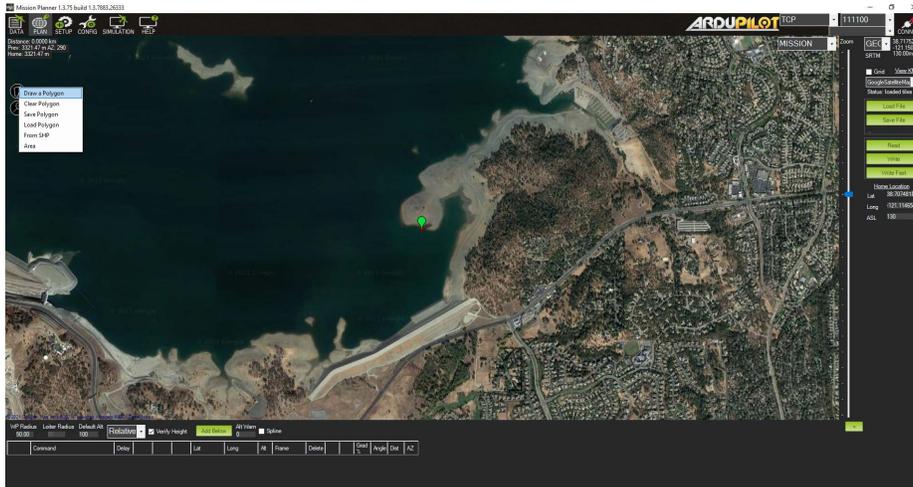


3. a) Click the Polygon that is circled on the top far left.

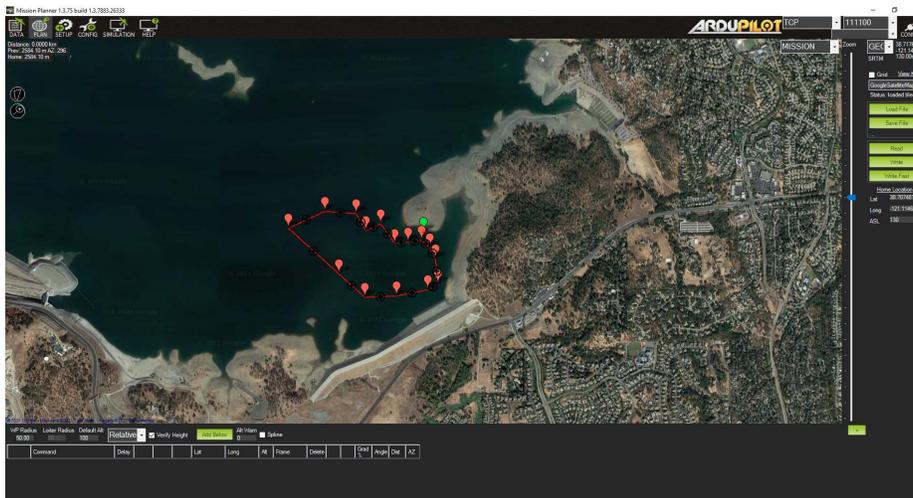


Mission Planning

b) Click Draw Polygon (click OK through prompt)

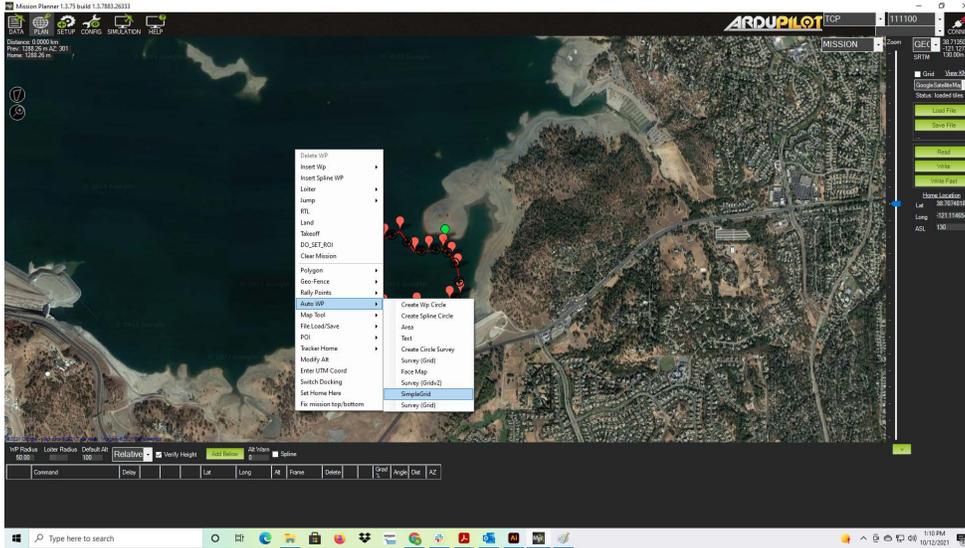


c) Draw your survey area



Mission Planning

4. Right click
 - a) Click Auto WP
 - b) Click SimpleGrid



- c) Under "spacing in line" increase the value to reduce the total amount of waypoints. This increases visibility when planning a mission and also improves the functionality of the AutoNav



Mission Planning

d. Under subcategory “Simple Options”, adjust parameters for “Angle [deg]” that you need.



e. Under subcategory “Simple Options”, adjust the parameters for “Distance Between Lines [m]” to suit the needs of your survey.



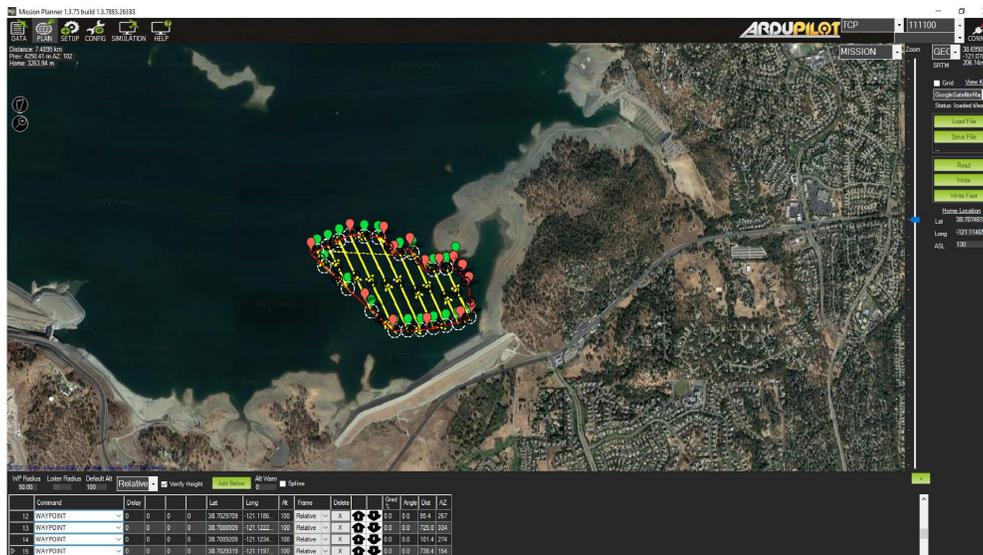
Mission Planning

f. Click accept.



5. Creating a grid:

a. Repeat steps 4a through 4c with a 90° offset in the line angle.



Mission Planning

6. Write WP file to AutoNav. (You may save WP file for future surveys)
 - a. This function will save the mission to the AutoNav topside control box.
 - i. To initiate the mission, flip the top left switch on the Taranis remote to swap from "nanocl" to "Auto" Flight mode.
 - ii. HyDrone or EchoBoat will start on its mission shortly after switching from Manual to Auto mode on the Taranis remote. "Write WPs" alone will NOT start the mission.

More Notes for AutoNav Best Practices

Important: AutoNav **does not** have collision avoidance. User should flip to manual mode for obstacle avoidance and maintain line of sight on the USV always.

AutoNav **does** have a return to home function. It is not set up on the transmitter. To activate, click back onto Flight Data. Below the HUD, click on Action Tab. Click RTL(Return to Launch) BE AWARE, IT WILL HEAD DIRECTLY TO THE POINT YOU ARMED. If there are objects in the way or you armed on shore, it will try and go through it.

