

Parking Rover Manual



**Senior Design Spring - Summer 2021
Parking Lot Rover Team
The University of Texas at Arlington**

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Setup Mission Planner

Windows

- Navigate to this site:
 - Site: <https://ardupilot.org/planner/docs/mission-planner-installation.html>
 - Click on the latest download.
 - Follow the setup wizard.

Linux

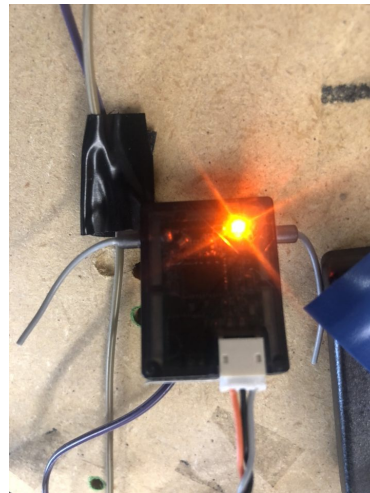
- First install wine
 - Open your terminal
 - > sudo apt update
 - > sudo apt install wine
- If you have a 64 bit installation of linux. Add 32 bit architecture support
 - sudo dpkg --add-architecture i386
- Download Mission Planner
 - Site: <https://ardupilot.org/planner/docs/mission-planner-installation.html>
 - Open terminal and navigate to the folder the zip file is extracted to and run the following command.
 - > wine installer.exe
 - To run the software, install mono: a cross platform .NET platform.
 - Then navigate to the folder and run the following command
 - > wine MissionPlanner.exe

Setup Rover

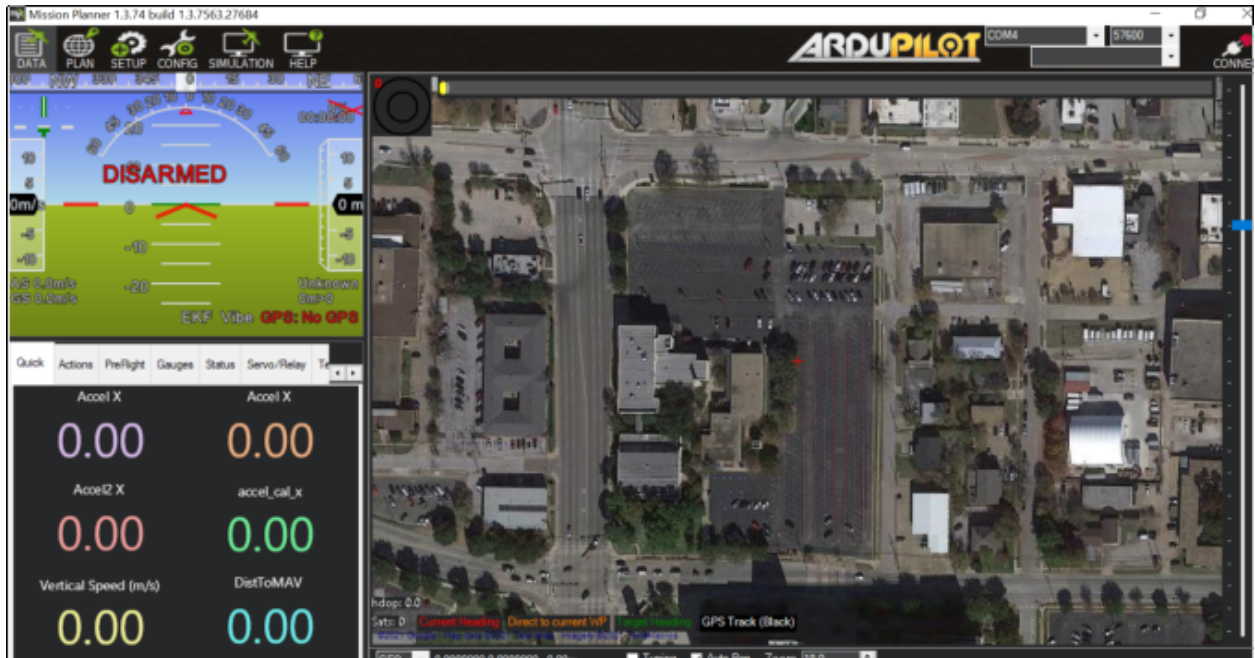
1. Turn on both switches, pictured below, to ensure power is supplied to the rover's components.
 - a. The 25 Ampere (on the right) switch turns on the motors.
 - b. The 50 Ampere (on the left) master switch supplies power to the entire rover.



2. Once the rover is turned on, you can manually control the rover with the remote controller provided.
 - a. When you turn the controller on, pull the left joystick down to lower the throttle (explained in future sections).
 - b. Make sure the receiver, pictured below, has a stable LED on, meaning the receiver is connected to the transmitter (the remote control).



3. Open Mission Planner, the home screen should look similar to the image below.



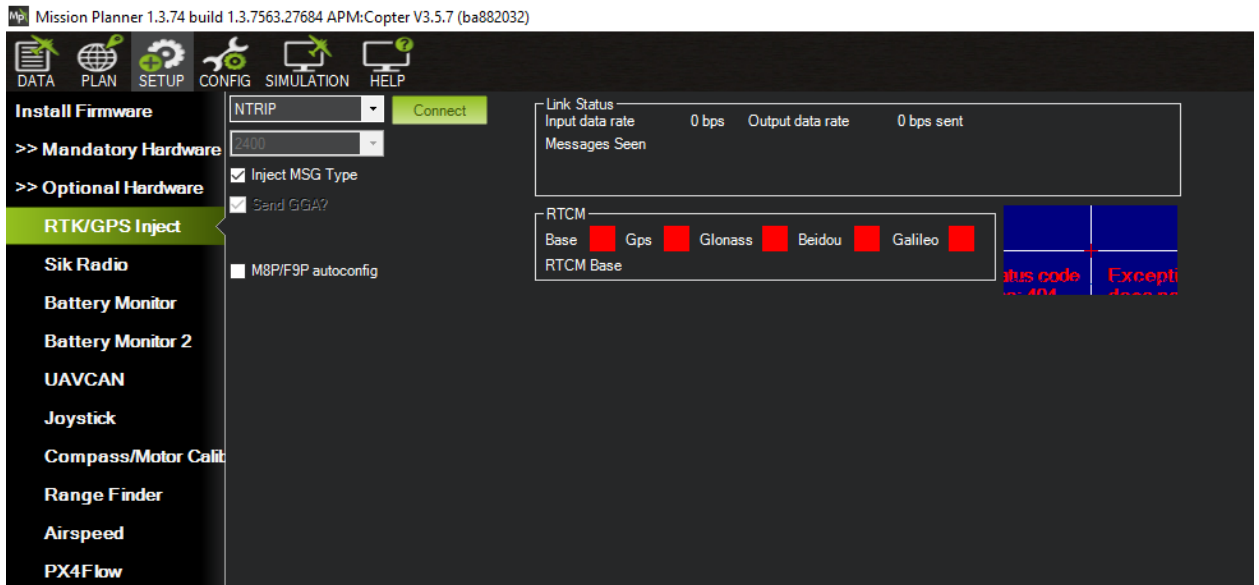
4. Using one of the telemetry radios (shown below), connect it to an available computer with Mission Planner Installed using the USB cable provided
- Please see [http://www.holybro.com/manual/Holybro RadioV3 Quick-Start-Guide v1.2.pdf](http://www.holybro.com/manual/Holybro%20RadioV3%20Quick-Start-Guide%20v1.2.pdf) for information on the telemetry radios



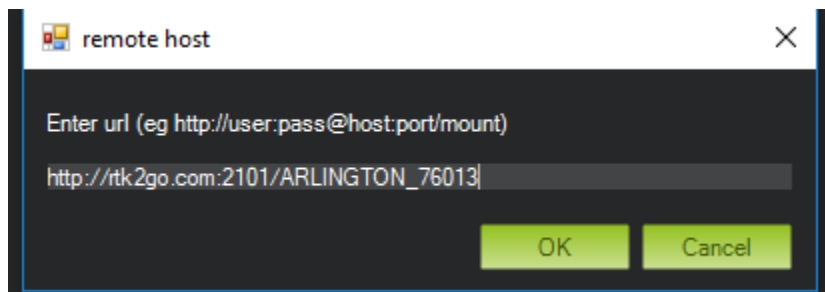
- b. The telemetry radio will communicate with another radio connected to the Pixhawk, which will allow the user to configure the settings remotely and select way-point mappings when the rover is set to auto. Please make sure the telemetry radios are of the same frequency.
5. Select the “CONNECT” option on the top right corner of Mission Planner. Select the correct port with a baud rate of 57600 to properly connect the telemetry radio to Mission Planner and the Pixhawk.
 - a. Please see <https://ardupilot.org/copter/docs/common-sik-telemetry-radio.html> for more information on using telemetry radios with Mission Planner.

Connect to Base Station via RTK2GO server

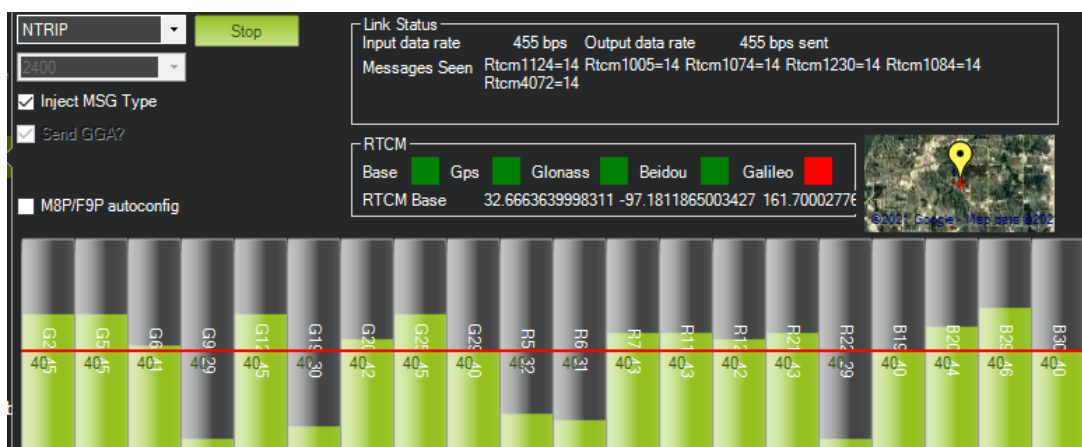
1. The Pixhawk must be configured to be injected with RTK/GPS before it can use the base station's information for GNSS corrections. This is done by connecting the Pixhawk via an NTRIP server to the RTK2GO server with information coming from a selected base station.
 - a. Select the "SETUP" >> "Optional Hardware" >> "RTK/GPS Inject"
 - b. Select the "NTRIP" option from the drop down menu and click "Connect"



- c. The user will be prompted with entering the url to the desired base station. The format is as follows: `http://rtk2go.com:2101/base_station_name` (base stations can be found at: <http://rtk2go.com:2101/SNIP::STATUS>)



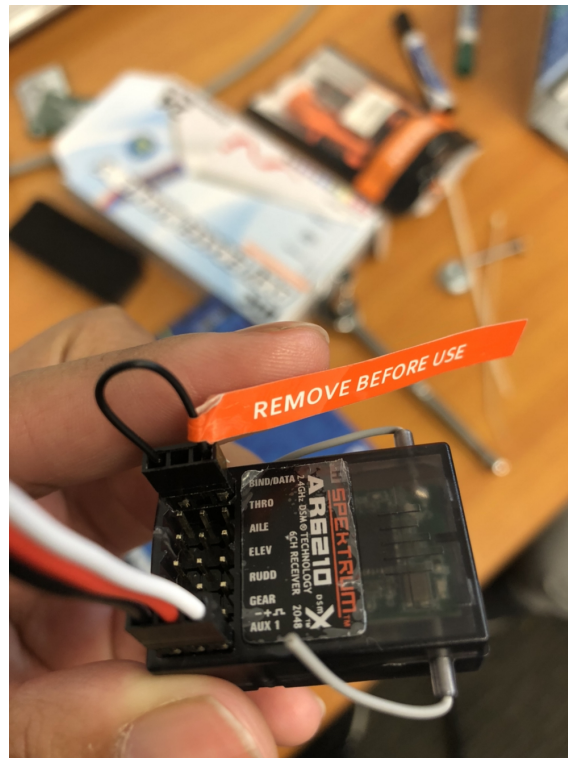
2. Once the base station is verified and connected, information from the base station will be retrieved and can be used for GPS corrections.



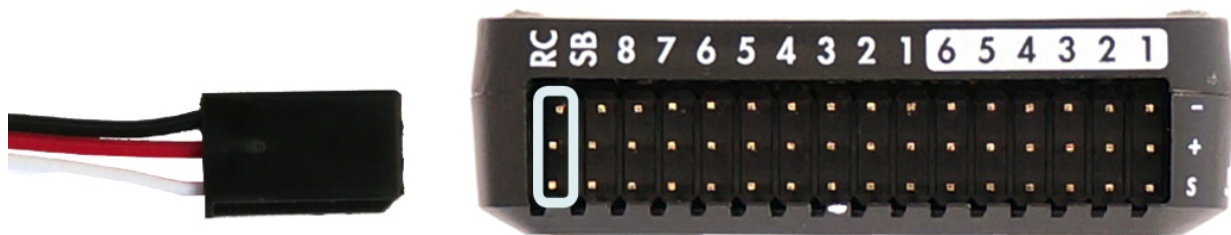
Binding

IF the receiver and transmitter are not working, you can rebind the receiver.

1. Grab the SPEKTRUM AR6210 receiver(, shown below, with the jump wire shown below in the bind/data port

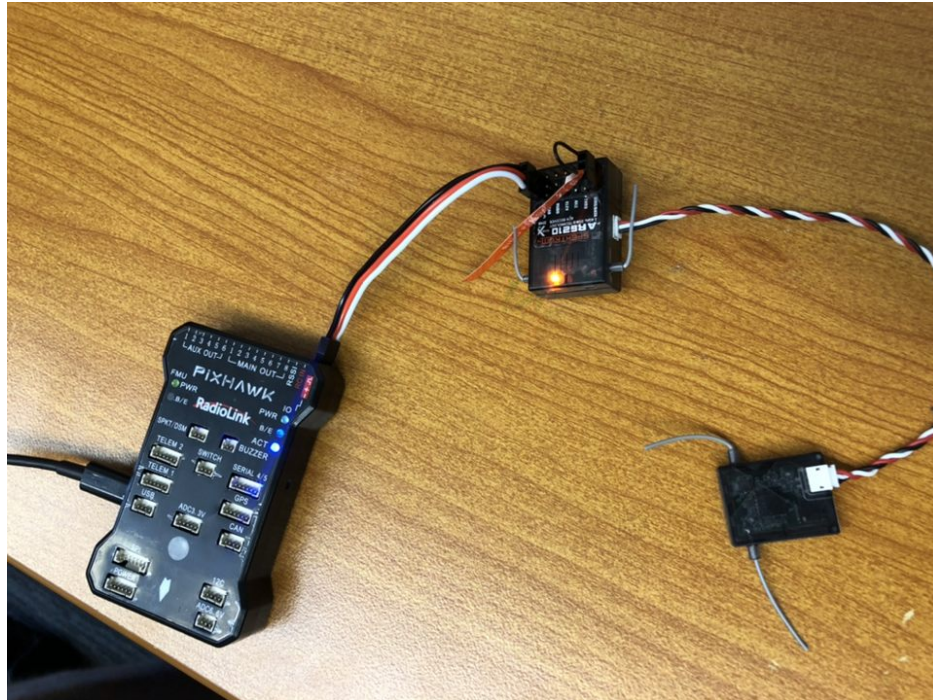


2. Connect the Red, White and Black wires to the pixhawk in the RCIN ports



3. Once connected to Pixhawk, disconnect the receiver HA10X that was placed on the pixhawk to the SPEKTRUM AR6210 receiver shown below
 - a. Make sure the Pixhawk is powered on, but the motors are powered off.

- b. Both receivers should have a blinking LED light, this means they are in binding mode
- c. Grab the transmitter, the remote controller, and set it up to binding mode. You can do this in two ways. Please refer to the Spektrum DX6e manual provided to you when you receive the rover



BINDING

Binding is the process of programming the receiver to recognize the GUID (Globally Unique Identifier) code of a single specific transmitter. You must bind the receiver to your transmitter before it will operate. To put the transmitter in bind mode, press the Bind Button while powering on the transmitter

Binding the AR620 Receiver

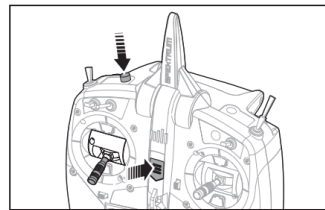
The failsafe programming option is set during the binding process. In the unlikely event the radio link is lost during use, the receiver will drive all channels to their programmed failsafe positions.

Failsafe Programming Options:

SmartSafe™ + Hold Last failsafe

If loss of signal occurs, SmartSafe™ technology moves the throttle channel to its preset failsafe position (low throttle) that was set during binding. All other channels hold their last position.

When the receiver detects signal from the transmitter, normal aircraft operation resumes.



Preset failsafe

Preset failsafe is ideal for sailplanes, allowing the aircraft to automatically dematerialize if the signal is lost. With preset failsafe, all channels go to their preset failsafe positions if the signal is lost, preventing a flyaway. When the receiver detects signal from the transmitter, normal aircraft operation resumes.

To bind in SmartSafe + Hold Last failsafe mode:

1	Lower the throttle on the transmitter
2	Push and hold receiver bind button
3	Power on receiver
4	Release the bind button when the receiver enters bind mode, indicated by a flashing LED on the receiver
5	Place the transmitter in bind mode. The transmitter and receiver are bound when the LED on the receiver glows solid.

To bind in Preset failsafe mode

1	Move all sticks and switches on the transmitter to the desired failsafe positions
2	Push and hold the receiver bind button
3	Power on the receiver
4	Release the bind button when the receiver enters bind mode, indicated by a flashing LED on the receiver
5	Push and hold the receiver bind button again
6	Place the transmitter in bind mode. The transmitter and receiver are bound when the LED on the receiver glows solid.
7	Release the bind button