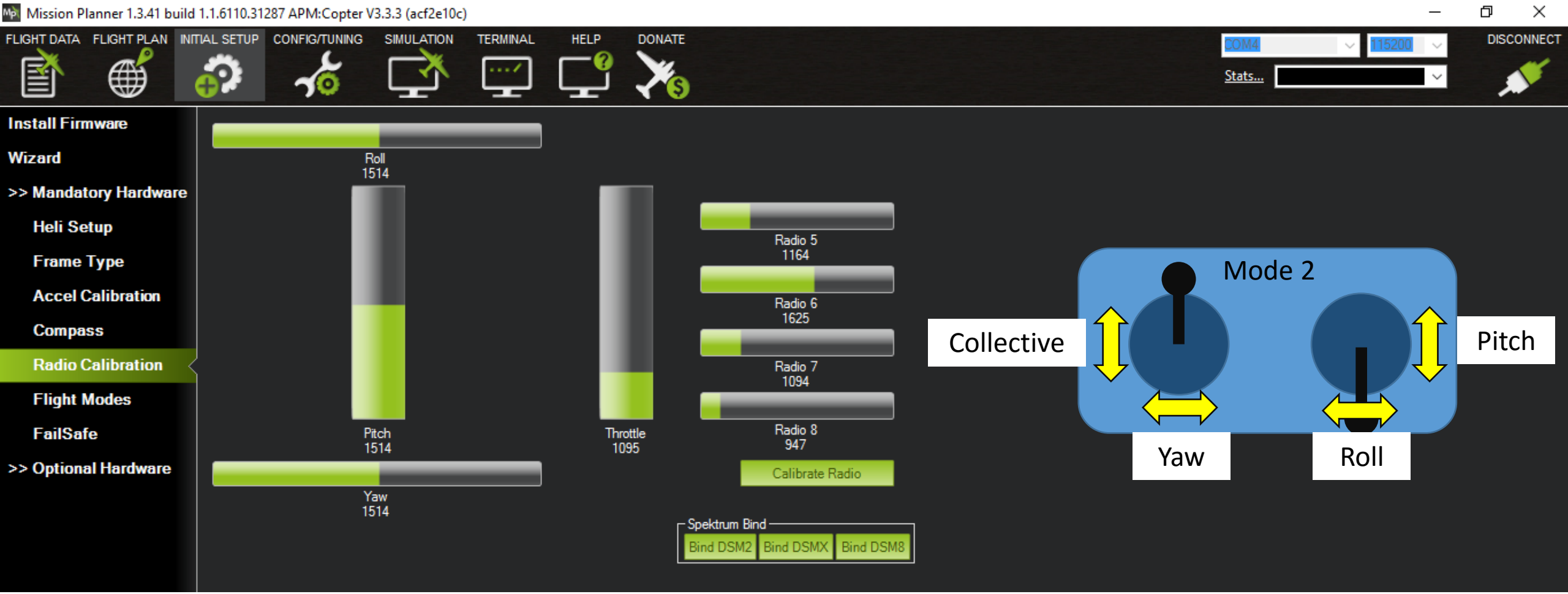
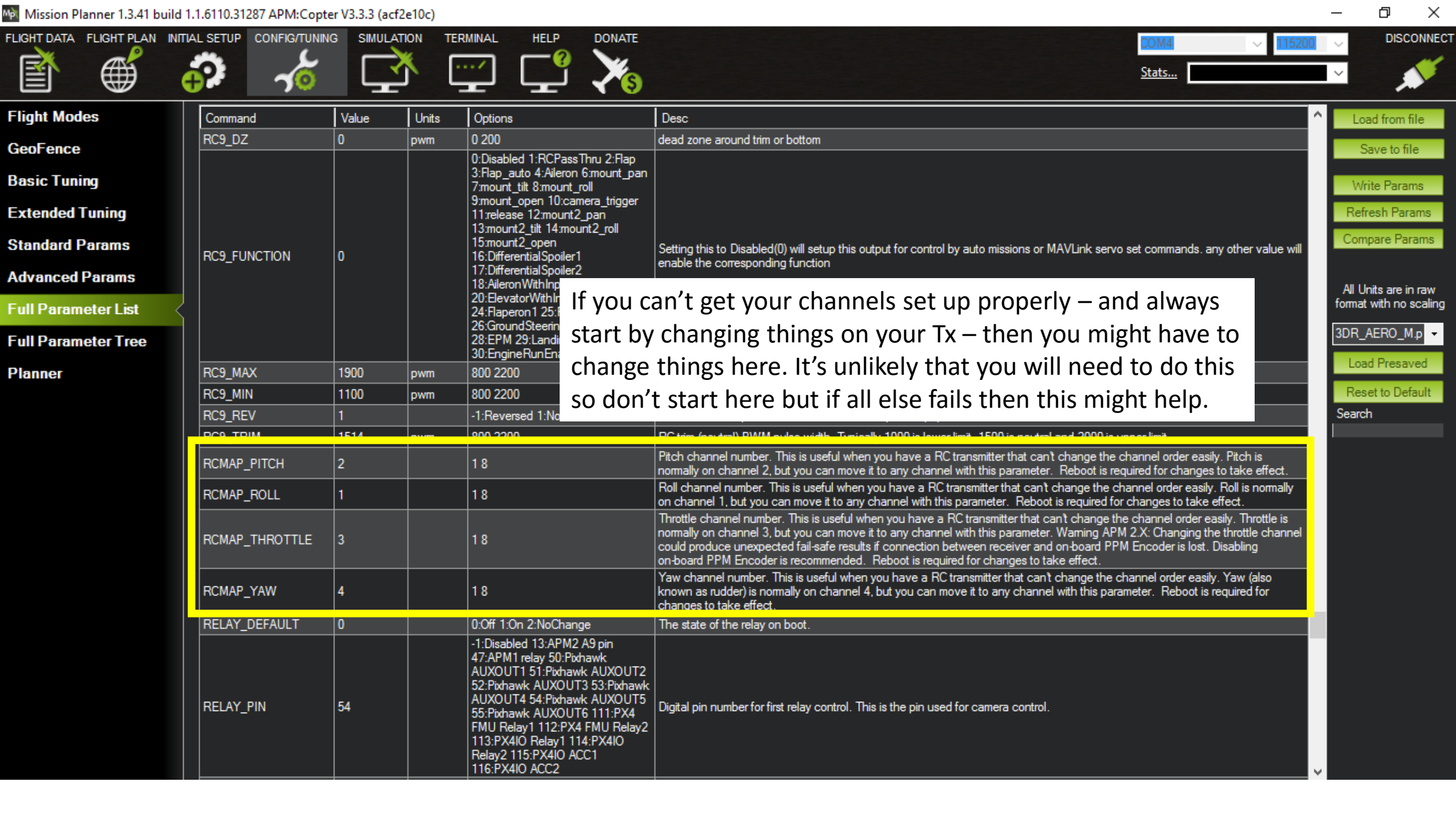
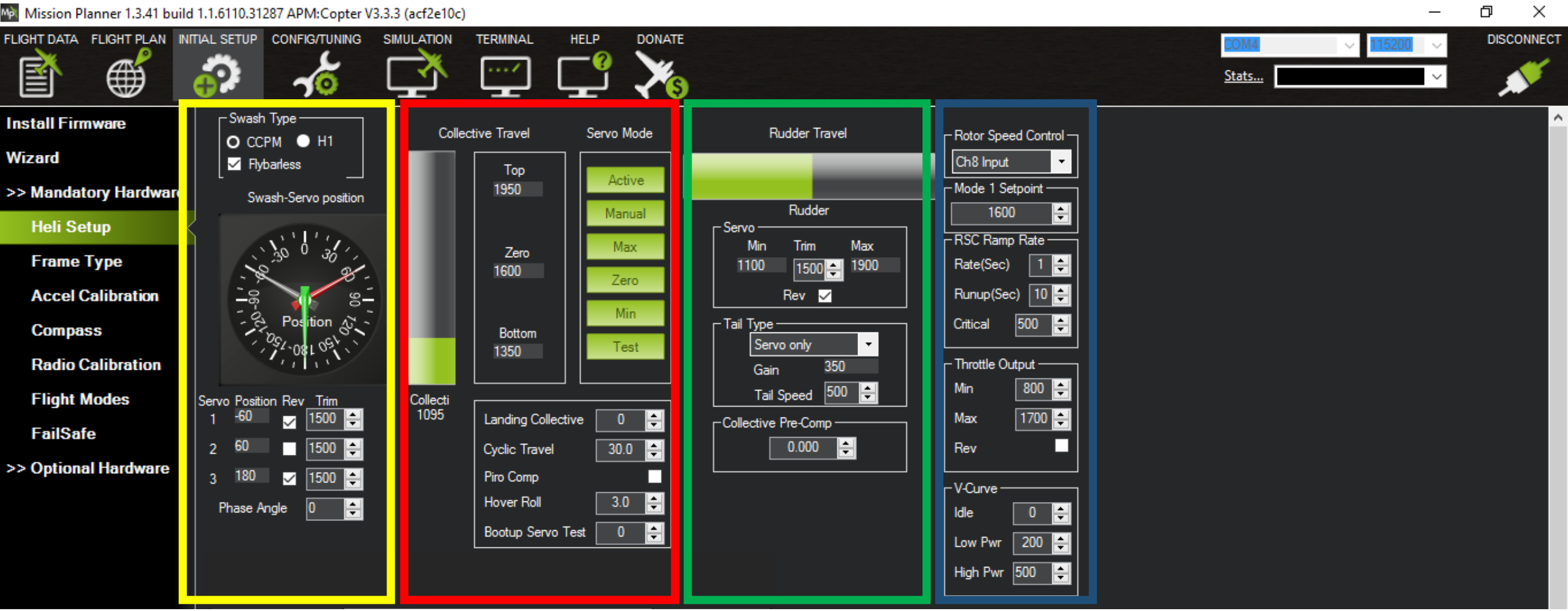
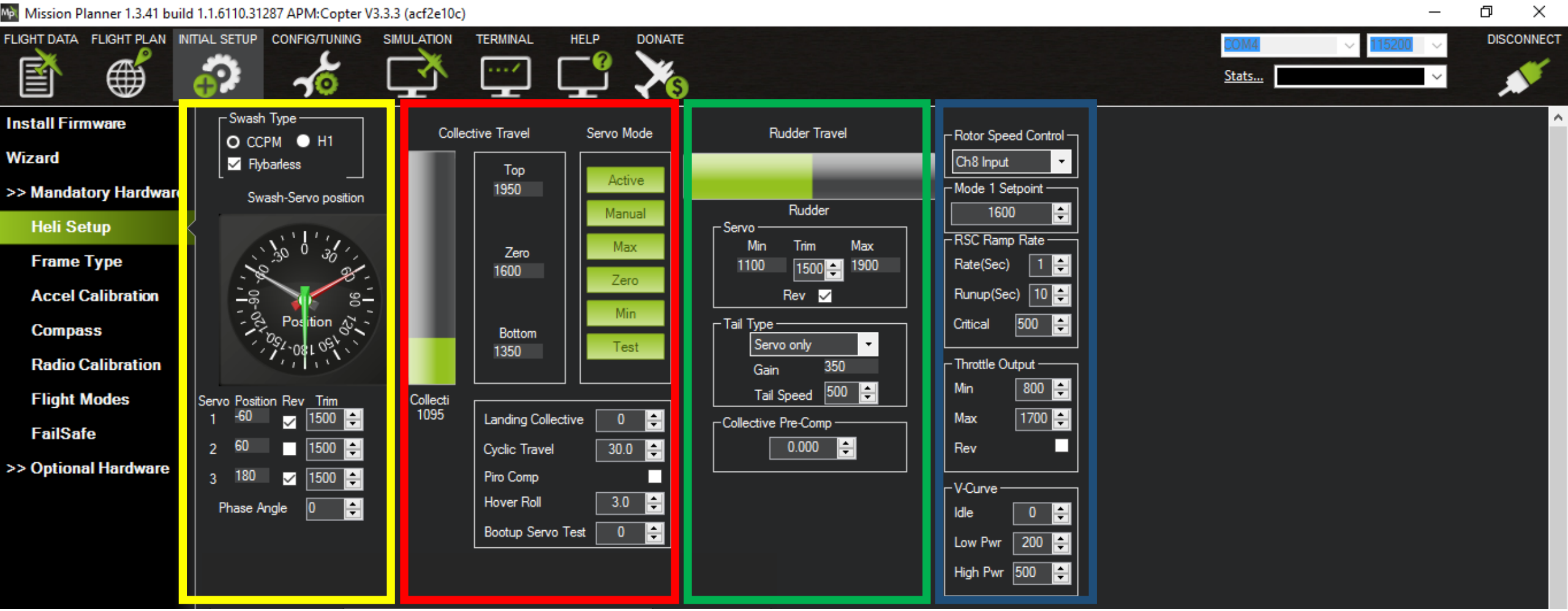


This is the place to start. If you don't get the Tx (Radio) calibrated then you will find the rest of the set-up impossible. Your Tx must command things in the right direction. Everything should move in the direction of your sticks except pitch. If not then reverse in your Tx. Throttle for helis is more like Collective. Once you are set up here you can move on to the heli set-up. Channel 8 is going to be used for throttle control so we are looking to put a low signal in to keep the rotor stationary will the heli is armed and then we'll flick a switch out of "hold" on the Tx and feed the signal in on Channel 8. There are other ways to control the throttle but for me this is the simplest – Channel 8 pass through on a switch. This also means you can kill the power if you need to – its controlled by you. But importantly never kill the power while in flight or its all over! So choose a switch that is clear a typically out of reach. Ensure that all trims are centered and press the Calibrate Radio button shown on the screen.


Mission Planner 1.3.41 build 1.1.6110.31287 APM:Copter V3.3.3 (acf2e10c)
FLIGHT DATA
FLIGHT PLAN
INITIAL SETUP
CONFIG/TUNING
SIMULATION
TERMINAL
HELP
DONATE
COM4
115200
DISCONNECT
Stats...
Flight Modes
GeoFence
Basic Tuning
Extended Tuning
Standard Params
Advanced Params
Full Parameter List
Full Parameter Tree
Planner
Command | Value | Units | Options | Desc
RC9_DZ | 0 | pwm | 0 200 | dead zone around trim or bottom
RC9_FUNCTION | 0 | | 0:Disabled 1:RCPassThru 2:Flap 3:Flap_auto 4:Aileron 6:mount_pan 7:mount_tilt 8:mount_roll 9:mount_open 10:camera_trigger 11:release 12:mount2_pan 13:mount2_tilt 14:mount2_roll 15:mount2_open 16:DifferentialSpoiler1 17:DifferentialSpoiler2 | Setting this to Disabled(0) will setup this output for control by auto missions or MAVLink servo set commands. any other value will enable the corresponding function
RC9_MAX | 1900 | pwm | 800 2200 |
RC9_MIN | 1100 | pwm | 800 2200 |
RC9_REV | 1 | | -1:Reversed 1:No |
RCMAP_PITCH | 2 | | 1 8 | Pitch channel number. This is useful when you have a RC transmitter that can't change the channel order easily. Pitch is normally on channel 2, but you can move it to any channel with this parameter. Reboot is required for changes to take effect.
RCMAP_ROLL | 1 | | 1 8 | Roll channel number. This is useful when you have a RC transmitter that can't change the channel order easily. Roll is normally on channel 1, but you can move it to any channel with this parameter. Reboot is required for changes to take effect.
RCMAP_THROTTLE | 3 | | 1 8 | Throttle channel number. This is useful when you have a RC transmitter that can't change the channel order easily. Throttle is normally on channel 3, but you can move it to any channel with this parameter. Warning APM 2.X: Changing the throttle channel could produce unexpected fail-safe results if connection between receiver and on-board PPM Encoder is lost. Disabling on-board PPM Encoder is recommended. Reboot is required for changes to take effect.
RCMAP_YAW | 4 | | 1 8 | Yaw channel number. This is useful when you have a RC transmitter that can't change the channel order easily. Yaw (also known as rudder) is normally on channel 4, but you can move it to any channel with this parameter. Reboot is required for changes to take effect.
RELAY_DEFAULT | 0 | | 0:Off 1:On 2:NoChange | The state of the relay on boot.
RELAY_PIN | 54 | | -1:Disabled 13:APM2 A9 pin 47:APM1 relay 50:Pixhawk AUXOUT1 51:Pixhawk AUXOUT2 52:Pixhawk AUXOUT3 53:Pixhawk AUXOUT4 54:Pixhawk AUXOUT5 55:Pixhawk AUXOUT6 111:PX4 FMU Relay1 112:PX4 FMU Relay2 113:PX4IO Relay1 114:PX4IO Relay2 115:PX4IO ACC1 116:PX4IO ACC2 | Digital pin number for first relay control. This is the pin used for camera control.
If you can't get your channels set up properly – and always start by changing things on your Tx – then you might have to change things here. It's unlikely that you will need to do this so don't start here but if all else fails then this might help.
Load from file
Save to file
Write Params
Refresh Params
Compare Params
All Units are in raw format with no scaling
3DR_AERO_M.p
Load Presaved
Reset to Default
Search

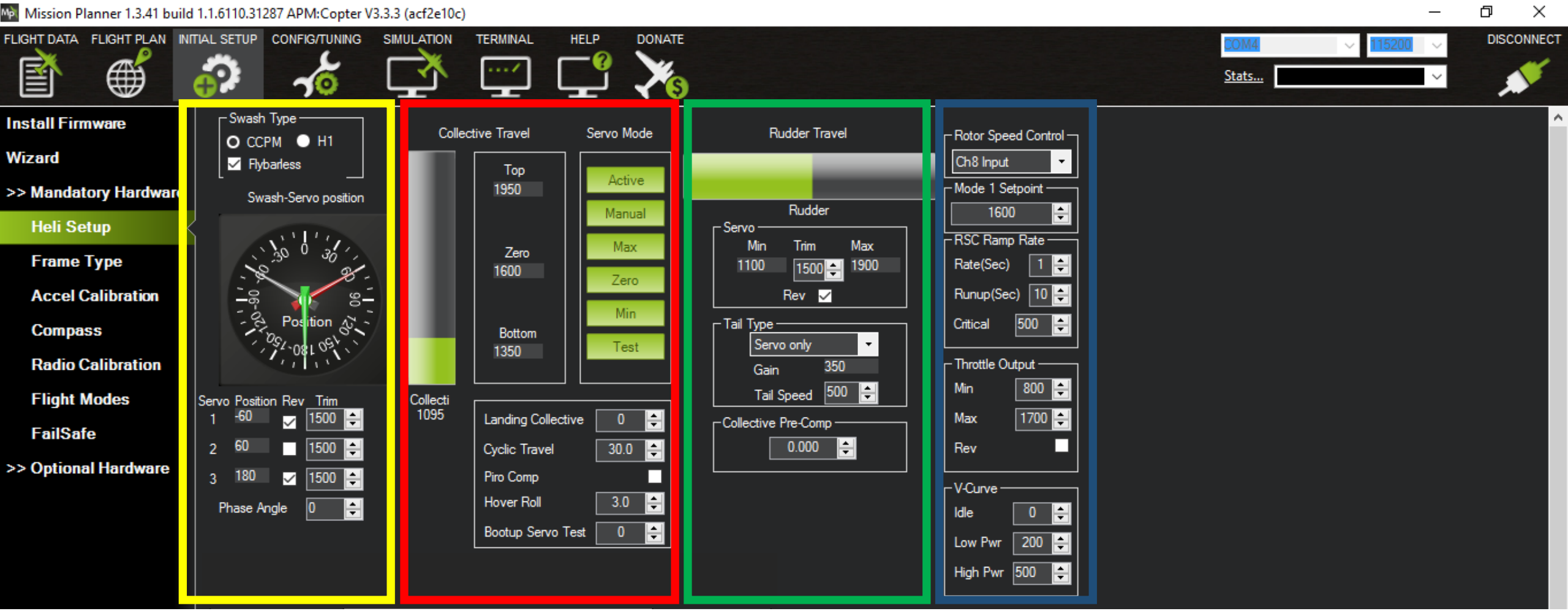


Ok, this is where the fun begins. Remove the rotor from your heli. Move left to right, starting with the setting up things in the yellow box. Choose Swash Type and make sure you swash is moving as expected. If not then reverse the servo that seems to be incorrect by selecting the Rev box. Don't change your Tx because that was moving things in the right direction when you calibrated it earlier - you want to get the controller (Pixhawk or APM) working properly. You may also have to move the position of the servo on the position compass by changing the respective boxes. Don't be afraid, position and direction are likely to have to change on some servos. Once the swash is set up, use a swash leveling tool and move the swash up and down getting it as level as possible using the Trims. To get any changes to pass to the controller click your mouse in the Position compass.



Now for things in the red box. Click on the Min button and check that the swash doesn't bind. Click the Max button and check that the swash remains within reasonable limits. Now reinstall the head. Click Zero and using a pitch tool set this to zero. Now click Min and you should have -9 to -12 degrees of pitch. Click Max and set up +9 to +12 degrees. Use the numbers in the boxes to set this up. These represent the output from your Tx. Once this is done, press Test and see that there is no binding of the swash or head. If so, reduce limits.

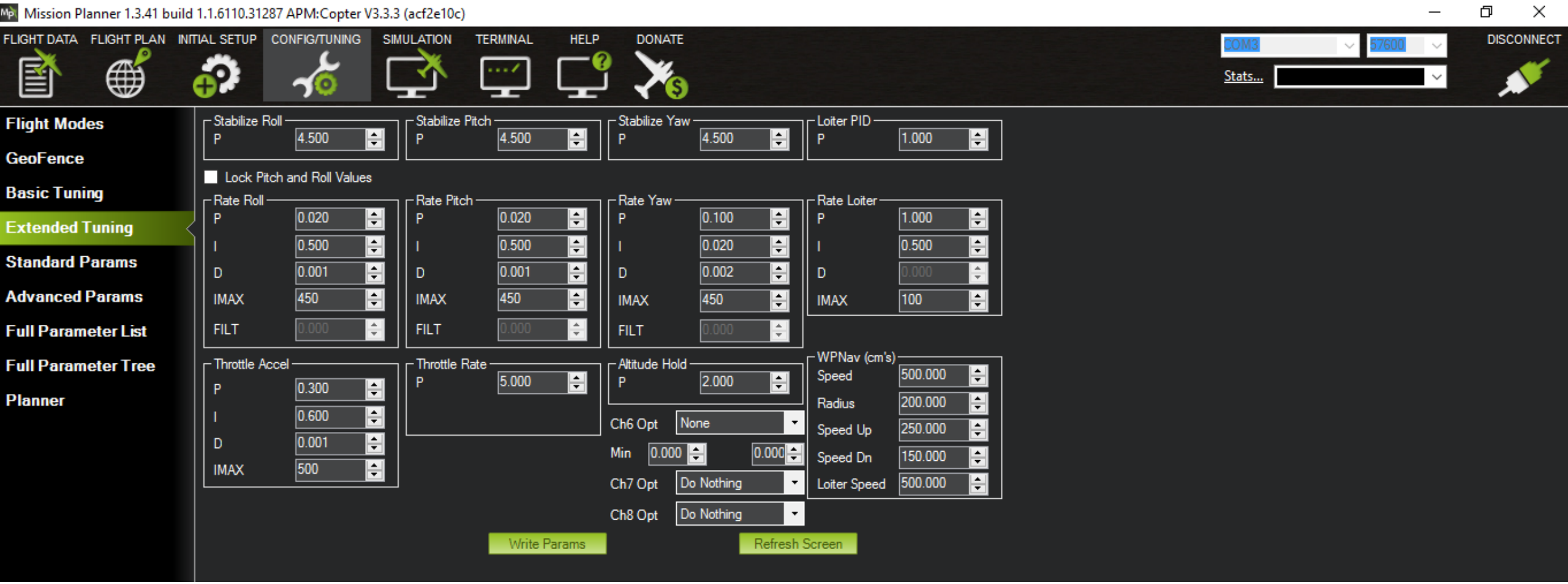
Moving on to the green box, connect your rudder servo. Ensure it travels in the correct direction and then set the Min and Max position



Moving on to the green box, connect your rudder servo. Select the right tail type in the middle box. Ensure the servo travels in the correct direction, Rev if necessary, and then set the Min and Max position to ensure it does not bind. Set the trim to zero pitch. Now press the Test button in the red box and all servos should move to their extremes. Check that there is no binding.

Now to the blue box. The simplest set up is to use Ch 8 output as shown and control the motor from your Tx. There are other settings and you can test these yourself but do so with the blades removed so you don’t get a fright or worse still. Ok, on to the last step, setting up the collective to hover at mid-stick.

The collective control is used to ensure the heli hovers at mid-stick given that RPM will typically be constant.



Typical tuning parameters for a 400 size heli with digital servos and constant RPM are shown here. Note that a number of these settings are below range and had to be set in the “Full Parameter List” tab. Make sure that you “Write Params” after you change anything. Also a handy tool to test settings is to use the Ch6 Opt and set a Min and Max value and try a range. Always start with the P term, then the I term and the D term. See the notes on the Copter forum to understand in more detail what each of these do but remember you’re a heli guy and most of what is explained is for quad copters.