

Mini Mamba (V2) Assembly Sequence & Build Tips

A build video will be added to the Quadrysteria YouTube Channel late Dec-2014.

IMPORTANT NOTE. Each tube clamp consists of two halves: one half with M4 threaded-holes and the other half with M4 through-holes. Hereafter, the through-hole half of the arm clamp will be referred to as the *top half* of the clamp, and the threaded half will be referred to as the *bottom half*. There are two silicon O-rings for each clamp. These must be wrapped over the tube before installing the clamp.

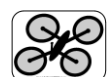
1. Build two arm sub-assemblies.

- a. Locate the parts bag labeled *Arm Clamps – Body*. Roll two pairs of silicon o-rings over each arm tube (eight total, four each tube). Situate each pair of o-rings approximately 22mm from the center of the tube where they will meet the body clamps.
- b. Now locate the parts bag labeled *M4 x 20mm screws (Quadcopter)* or *M4 x 30mm screws (Octocopter)* containing the motor mounts and related hardware. Roll two pairs of silicon o-rings over each arm tube end (16 total). Attach the motor mounts with the M4 screws, first through the motor mount, then the *top half* of the clamp, and lastly into the *bottom (threaded) half* of the clamp. Align the o-rings into the two grooves. Situate the outer clamp approximately 1mm away from the tube end.
- c. Before fully tightening the clamps, rotate the tube so the *center tube slot* is not facing upwards. This will allow access to route the motor wires later. Level the pair of motor mounts over two flat boards to get them into the same plane. Lastly, hand tighten the nylon bolts. **DO NOT OVER TIGHTEN** as this will risk stripping the threads.

2. Add the motors to the arm sub-assemblies.

There is a choice to route motor wires through the arm tubes for a clean look or just route them outside the arm tube to save time and make for easy repairs.

- a. **Option A:** When routing wires through the arm tubes, you need to extend the motor wires 70-80mm (depending on your motors) to reach the ESCs. Solder 20AWG wire to the motor wires. Route the motor wires through the motor mount slot and down the arm tubes, exiting at the tube center slot. Use blue thread lock to secure the motor bolts onto the mount.
- b. **Option B:** If you want to save time, the wires can be routed outside the tube to eliminate the need for extension wires. The wires instead can be secured onto the outside of the arm tube with a couple of zip ties and/or covered with heat shrink or braided wire conduit. If you choose to route wires outside the arm tubes, you can wait to attach the motors until the very end of the assembly. Use blue thread lock to secure the motor bolts onto the mount.



3. **Build the power sub-assembly.** Solder the ESCs and battery lead to the power distribution board. Because carbon fiber is electrically conductive, I recommend wrapping the power distribution board in non-conductive material such as an anti-static bag or electrical tape. If you plan to use the onboard BEC outputs, now is a good time to adjust them and add output wires for FPV gear etc. Voltage adjustment is made with onboard screws. Check output with a voltage meter.

4. **Add the power sub-assembly to the lower frame plate.** Locate the parts bag labeled *Main Frame Plates Standoffs*. First, attach the four M3 x 30mm nylon standoffs to the lower frame plate (plate engraved with *Quadrysteria*) using the four M3x8 nylon screws. Now lay the power sub-assembly onto the lower frame plate in the center and route the battery lead out the rear hole in the frame plate. Attach each ESC to the frame plate with double stick servo tape. If you have FPV gear, now is a good time to add the wiring harness.

5. **Join arm sub-assemblies onto the top frame plate.** Each arm sub-assembly is secured to the frame with two tube clamps and nylon bolts. In a hard crash, the M4 nylon bolts should shear off, saving the more critical parts of the frame such as the carbon fiber arm tubes.
 - a. Locate the parts bag labeled *Arm Clamps – Body*. Insert the M4 x 25mm nylon screws through the top frame plate holes down, then through the *top-half* of the arm clamps. Align the arm tube center o-rings (installed in step 1.a) with the grooves of the clamps. Add the threaded *bottom half* of arm clamp and loosely tighten the nylon bolts. Leave enough play so you can rotate and align the arm. Repeat for the second arm sub-assembly.
 - b. Now adjust each arm assembly to center it with the frame. When centered each motor mount is approximately 20mm from the top frame plate edge.
 - c. Level the motor mounts, front to back, using a flat surface (suspend the quad on two blocks of plywood on a flat table). Alternatively, you can set the arms at a forward angle using a flat surface and a carpenter's miter square or protractor. 5 - 10 degrees is suggested. But you can experiment.
 - d. Lastly, hand tighten the nylon bolts. DO NOT OVER TIGHTEN as this will risk stripping the threads.
 - e. From the *Arm Clamps – Body parts bag*, add the eight M4 x 14mm aluminum standoffs onto the remaining M4 x 25mm arm clamp nylon screw threads. Hand tighten.

6. **Join the ESCs and motor wires.** If you routed wires through the arm tubes, add your flight controller and RC receiver to check the motor rotation before finalizing motor/esc connections. Flight controller standoffs are provided with M3 x 6mm screws. These are located in the bag labeled *Flight Controller Standoffs*. You can mount a flight controller on the upper frame plate slots, top (outside) or bottom (inside) or on the lower frame plate slots (inside). A



Naze 32 flight controller will mount to the far inside of the slots (30mm) while a KK2.x will align to the far outside ends of the slots (45mm). Add the optional protective cover over your flight controller with the four nylon standoffs and screws.

7. Add your **video transmitter** to the rear bay. Secure it with double-sided foam tape or a Velcro strap. Add the optional interlocking video transmitter cover (small piece with three antenna holes). You can glue this cover but I recommend leaving one side removable. If you use hot glue it can be removed later by flexing open the two frame plates.
8. **FPV camera options:** You can locate a mini FPV camera mounted in-between the frame plates at the nose of the frame. There are mount holes for encased board cameras. Alternatively, the FPV camera can be located on the top frame plate using either with mount holes or the included carbon fiber mount plate for board cameras. A little CA glue wicked into the bottom edge of the carbon fiber will hold it in place. Attach the board camera to the carbon fiber mount using eight zip ties: two for each corner pulled together to form a "nylon rivet". If you fly fast in forward flight, I recommend your camera pivot upwards allowing you to see more of the horizon.
9. **Mobius camera options:** A Mobius or keychain size camera can be mounted either: a) in-between the frame plates at the nose of the frame secured with foam and velcro straps; b) at the nose of the top frame plate using the provided carbon fiber mount and four rubber damping balls. There are two position choices for the rubber damping balls. If you fly fast in forward flight, I recommend raising the front edge of the Mobius with some foam so you are not recording the ground.
10. **Add the top frame plate.**
 - a. Now join the top frame plate to the bottom frame plate with four M3x8 nylon screws attached to the M3 x 30mm nylon standoffs (added in step 4). Parts bag: *Main Frame Plates Standoffs*.
 - b. Add the eight M4 x 6mm nylon screws through the bottom plate and into the aluminum standoffs at the arm clamp. Parts bag: *Arm Clamps – Body*.
11. **Add the battery plate and landing gear:** Locate the parts bag *Battery plate standoffs*. Attach the four M4 x 25mm standoffs to the bottom frame plate with four M4 x 10mm screws. Add the plastic caps onto the blunt (female) end of the M4 x 14mm standoffs. Insert the male end through the battery plate holes and screw into the standoffs.

