10 step Mini Mamba Assembly Sequence

Please read all 10 steps before beginning assembly.

1. **Build two arm sub-assemblies**. Attach the motor mounts and landing talons to the arm tubes. Use two aluminum tube clamps for each motor mount. The landing talon is fit over the arm tube between the two aluminum arm clamps. The talon interlocks with two holes in the motor mount. Before fully tightening the clamps, rotate the tube until the slot in the center of tube slot is pointing forward (or backwards) to allow access for motor wires (optional later). Align the outboard tube clamp 1mm from with the edge of the arm tube. And align / level the pair of motor mounts on a flat table surface. Lastly, tighten clamp screws.

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. When routing through the arm tubes, you need to extend the motor wires 70-80mm to reach the ESCs. Solder 20AWG wire to the motor wires. If you don't care how it looks, just route them outside the tube and you won't need to extend any wires and use a couple of zip ties to hold the wires to the arm tubes (during step 7). Alternatively, exposed wires can be covered with heat shrink or braided wire conduit for a cleaner look. Route the motor wires through the motor mount slot and down the arm tubes, exiting at the tube center slot. Bolt the motors onto the mounts with blue thread lock.

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. Voltage adjustment is made with onboard screws. Check output with a voltage meter.

4. **Add the power sub-assembly to the lower frame plate**. First, attach the four 15mm nylon standoffs to the lower frame plate with 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, add the wiring harness now.

5. **Add the top frame plate**. While it's still easy to reach the underside of the top plate, attach the four flight controller standoffs to the upper frame plate slots. A Naze 32 flight controller will mount to the far inside of the slots while a KK2.x will align to the far outside ends of the slots.

a. Use four M3x6 nylon screws to attach the FC standoffs. Route the ESC signal wires through the top frame plate center hole.
b. Now join the top frame plate to the bottom frame plate with four M3x8 nylon screws into the frame plate nylon standoffs (added in step 4).

6. **Join arm sub-assemblies with frame sub-assembly**. Each arm sub-assembly is held into the frame by two aluminum tube clamps.
    a. Align each clamp onto the arm at either end of the slot in the center of the tube. Don't worry about exact placement until you lose fit the bolts through the clamp holes. Insert the bolts through the top frame plate holes down through the clamps and out the bottom frame plate - add the nylock nuts to the bolt ends. Snug up the clamp bolts - but don't fully tighten yet. Leave enough play so you can still 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 22mm 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 wood on a 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.

7. **Join the ESCs and motor wires**. Add your flight controller and RC receiver to check the motor rotation before finalizing. Add the protective cover over your flight controller with the four nylon standoffs and screws.

8. If your **video transmitter** fits in the rear bay. Secure it with double-sided foam tape or velcro. Add the optional interlocking video transmitter cover (small piece with three antenna holes). Gently flex open the two frame plates and insert the cover into the slots. It's not necessary to glue this cover.

9. Add the **CCD camera** mount to the top of the lower plate slots. Secure the CCD camera mount plate with a little CA glue wicked into the bottom edge of the carbon fiber or use epoxy. If your CCD camera has a break-away edges, remove this to keep it smaller and lighter. An alternative way to attach a CCD to the plate is with eight zip ties: two for each corner pulled together to form a "nylon rivet".

10. Attach the **Mobius mount** using the four rubber damping balls. A wide-angle Mobius will need some extra clearance for the CCD camera. Put foam under the Mobius mount (approx. 8mm thick). Make the front edge thicker to raise the Mobius recording horizon.