AMR V2/Extra 260 V2 Motor Box

When assembling your AMR V2 or replacing your motorbox after a crash, please follow these few precaution steps to verify your motorbox will withstand the high torque of the Thrust 45 Revo setup.

I purposely designed the AMR V2 motorbox as a separate part to the fuselage. The main advantage is in case of a mishap or crash, so the flyer is able to replace just the motorbox and not the entire fuselage and tail section, saving a lot of money. It does require a little extra work but it is certainly worth it in the long run.

The motor box comes pre-glued, with the correct motor thrust angle built into the pre-drilled firewall.

CAUTION- The motor box has been designed, tested and drilled for the Thrust 45 Revo motor. Using a larger motor or using an improper propeller size or a prop adaptor which is out of true can lead to a motor box failure which will cause damage to your AMR V2. For technical data on the Thrust 45 Revo please visit **www.thrustmotors.com** and download the data sheet.

CAUTION- Once glued the motor box is extremely robust, however, <u>following any</u> crash, propeller ground strike or hard landing it is essential that the cowl be removed and all joints inspected for cracks and repaired as required. **Do NOT use any imbalanced, oversized, chipped propellers or with an off-centered hub hole as excessive vibrations can lead to premature motor box failure.**

If your motor box broke due to a crash we recommend that you don't attempt to repair it as it may fail in flight. Replacement motor box is available (see replacement parts list at the end of this manual). Instructions and video on how to replace it are available on our website.

1. Prior to installation **go over all pre-glued joints** with white carpenters' glue or epoxy **(except the mounting plate!)** to ensure they are properly bonded and no gap between the parts is present so it will be able to withstand the torque generated by the powerful Thrust 45 Revo motor.

Go <u>thoroughly</u> over the entire motor box and verify that there are no cracks. If there is any, it must be fixed properly with epoxy.
NOTE- **DO NOT** modify the motor box or firewall. Any modification may lead to a motor box failure and will void warranty.

2. Verify with a ruler that the CF stringers do **NOT** protrude the rear of the motor box, otherwise the motor box will be mounted with an incorrect thrust angle which will impair the AMR V2 flight performance, therefore, if needed, sand/file the rear ends of the stringers flush with the motorbox ply.

Step 3
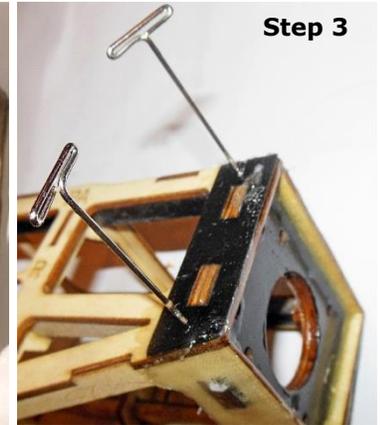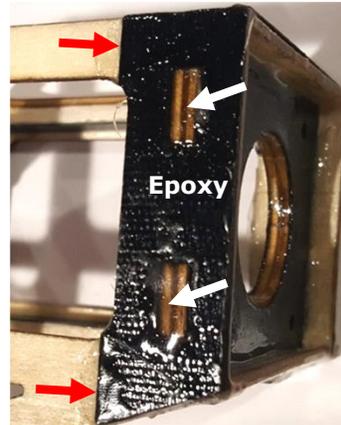
Epoxy

3. Take the two supplied composite plates and lightly sand/roughen one side of each plate to allow better gluing surface. Apply a medium layer of slow cure epoxy (with a stick, flat tool or a brush) over the entire surface of each plate and the motor box front perimeter (including top and bottom sides) then place the plates over the ply and align them properly. Use a few pins or modeling clamp to hold the plates tight onto the motor box with **no gap** until the glue cures. Apply some epoxy over the mounting plate tabs and along the rear seam of the plates, especially if there is some gap between the plates and ply. Continue by applying a bit of epoxy over the front frame.
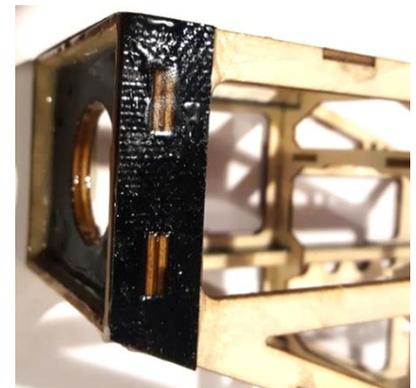
Side plate
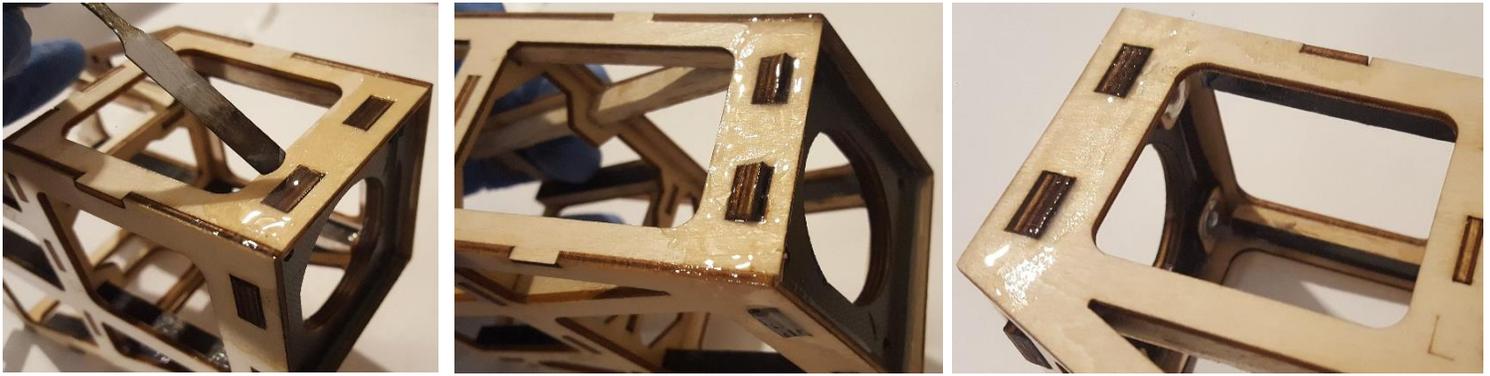
Apply epoxy over the motorbox front perimeter (including top and bottom sides)


Epoxy over the front frame

4. Using a cotton swab apply a thin layer of epoxy in the mounting plate vent holes except the mounting bolts' holes.
wipe off any excess where the motor will be mounted.

5. Next use a round needle file to pierce a hole in
the covering at the sides of the fuselage as shown in the photo in order to accommodate the long carbon rod. The motor box is held in place by three carbon pins; two short pins behind the bulkhead, and one long rod in front of it. These carbon pins fit into the pre-drilled holes in the motor box mounting lugs.
Test fit the motor box and carbon pins in the bulkhead prior to applying 30 minute epoxy.

<u>Do not force</u> the motor box into the slots. If it is too tight use a fine file to slightly enlarge the slots until a perfect fit is achieved. If the carbon pins are difficult to insert, use a round needle file to slightly enlarge the holes or taper the pins. The long rod in front of the bulkhead should not protrude out the sides of the fuselage as this will interfere with the cowl. Shorten this rod if required using a file. Next, gently

Epoxy in the vent holes

work the motor box in until it sits **perfectly** flush with the fuselage front bulkhead **without any gap** present. A gap between the motor box and bulkhead will weaken the joints and <u>change</u> the pre-set motor thrust angle so take your time to do it right.
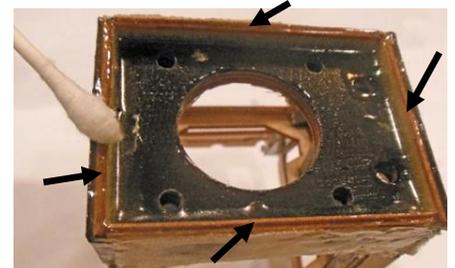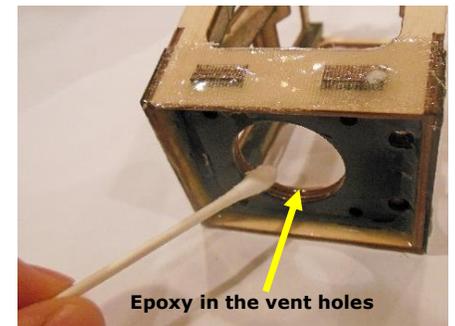
6. Once satisfied with the fit, insert the three CF pins in place.
Hold the motorbox firmly against the bulkhead to **eliminate any gap** and apply a few drops of CA to the center top and bottom spots (one at a time) to "tack" it in place (see photos). Alternatively, you may use a clamp or zip ties at the center top and omit the CA. That will fix the motorbox in place while applying the epoxy. Next, run a thin bead of epoxy along the **entire seam** between the motor box and bulkhead including the CF pins. Use **only epoxy** and make sure you cover the **entire** CF rods, especially the one at the front. Spot gluing will **NOT** work and will allow excessive flex of the front bulkhead which can cause the motorbox to fail under loads.
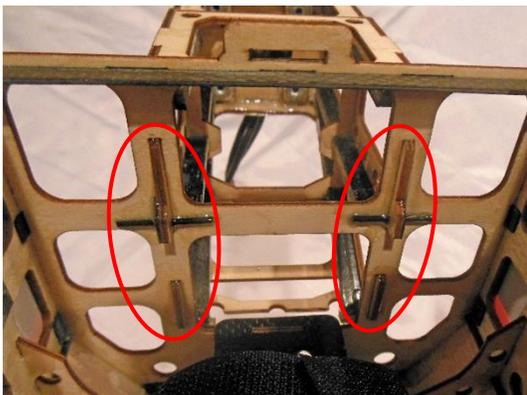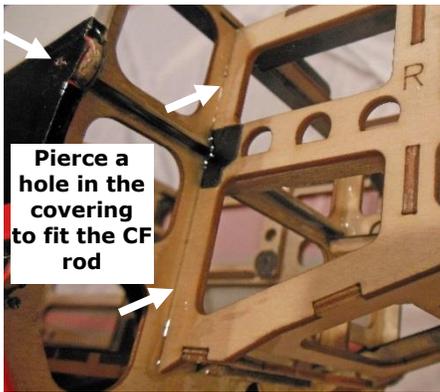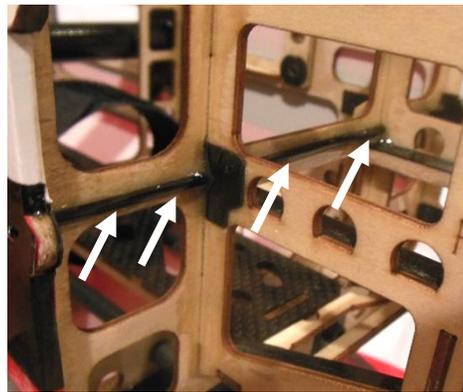

Glue motor box lugs and CF pins
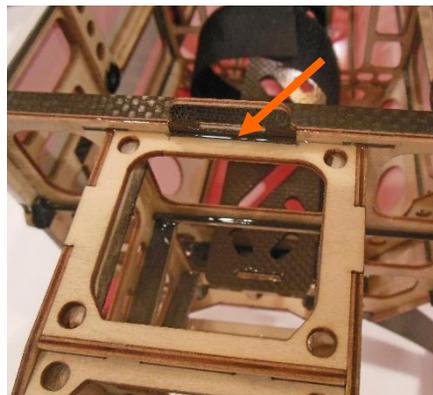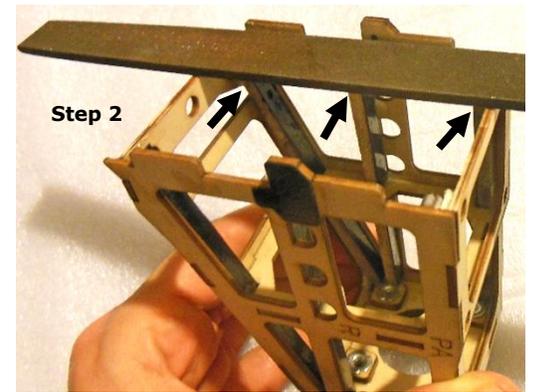

Epoxy
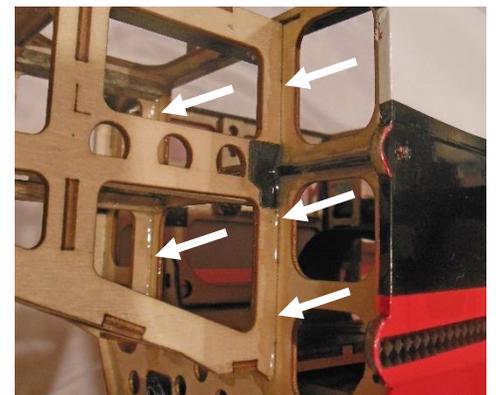
Leave no gap between motorbox and bulkhead

Pierce a hole in the covering to fit the CF rod
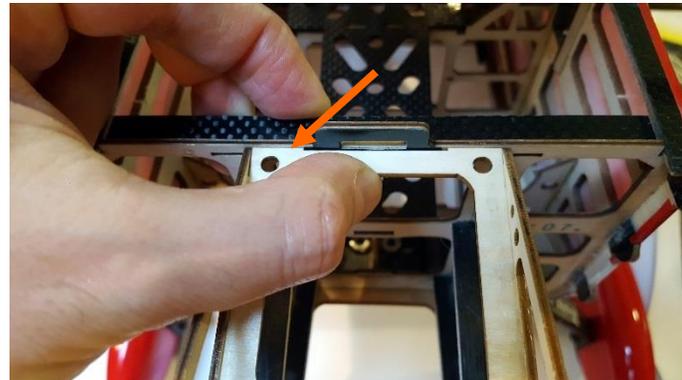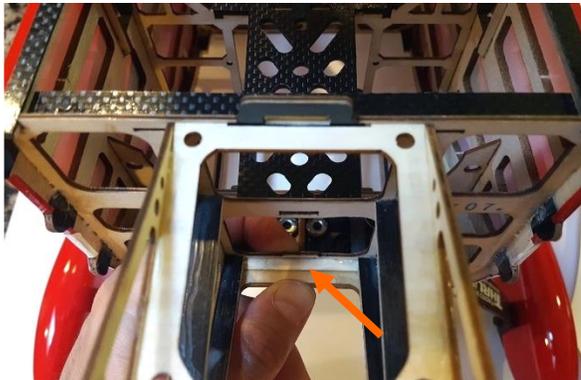

Step 2

Epoxy <u>ALL seams</u> of the motor box with the bulkhead

Cover the <u>entire</u> CF rod with epoxy

Verify CF corner stringers do not protrude

Hold the motorbox firmly with your fingers and apply a drop of CA (top and bottom) before applying epoxy

Motor and ESC Installation

Install the Thrust 45 Revo motor in front of the firewall using the supplied hardware. **<u>DO NOT under any circumstances enlarge/modify the motor box opening or mounting holes of the motor mount</u>**. The motorbox is pre-drilled to accommodate the Thrust 45 Revo motor, therefore, the installation is easy. Note: if there is any epoxy over the mounting plate that may prevent the X mount from sitting flush, scrape it off with a sharp blade as it may result in an incorrect motor thrust angle.

Make sure your X mount bolts are at least 14mm long. Due to the thick laminated AMR V2 mounting plate, shorter bolts may strip the thread and cause the motor box to fail under the extreme thrust. We strongly advice to use temporary (blue color) Loctite on all mounting bolts.

Our new and powerful T45 Revo is supplied with a CNC machined solid CF X mount for extra rigidity and weight saving.

Start by unfastening the shaft's retaining bolt, apply Loctite and refasten it firmly. **Do NOT** over fasten as you may shear the bolt's head! Always use correctly sized quality tools so you don't strip the bolts.

Scrape off any epoxy

Test fit the M3 mounting bolts into the laminated firewall to clear any debris. If the fit is excessively tight, do not use force. Use a 1/8" (3mm) drill bit to clear the holes in the firewall. **DO NOT** drill into the blind nut itself.

Now, you can test fit the same bolts in the CF X mount. If tight, use the same 1/8" (3mm) drill bit or a round file to slightly enlarge the holes.

Next, test fit the counter sink motor bolts into the X mount. The bolt heads should be level or better, slightly below the X mount surface. They must **<u>NOT</u>** protrude above the X mount surface. If they do, they will obstruct the X mount from a flush fit on the firewall, altering the thrust angle. Incorrect thrust angle will impair the AMR V2 flight
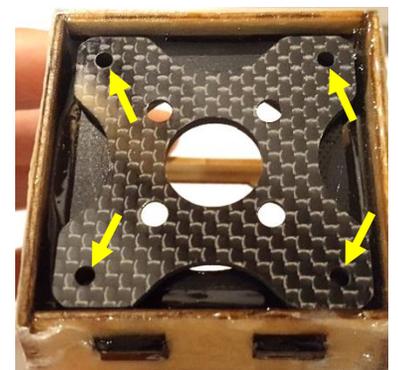
performance, therefore, if needed, use a 5/16" (8mm) drill bit to slightly enlarge the pre-drilled angle. Test fit during the process.

NOTE: X mount MUST sit flush with the firewall. **Do not** attempt to use washers between the X mount and the firewall as it can lead to a failure.

Caution: Over tightening the four motor mounting bolts may run a risk of crushing or cracking the motor mount plywood thereby weakening it. This increases the likelihood of an in-flight failure. Apply temporary (blue color) Loctite to the bolts and fasten them to a point where the motor sits firmly on the motor mount. Then add a quarter turn clockwise on the bolts to secure them.

Warning: Our new Quantum 45 Pro ESC has a selectable SBEC voltage output. **Verify** that the voltage jumper position is set to fit your servo brand and specs! Use the ESC instruction manual to guide you with the jumper positions voltage. If using the NXT80-HV servos, set it at 7.4V. **Higher voltage will damage your servos!**

To achieve the correct Center of Gravity, the ESC should be mounted as <u>forwards</u> as possible underneath the motor and in front of the cowl air cooling intake. In order to do so an extension lead must be used on the ESC Rx cable. Properly solder a short extension lead to the existing cable as you previously did with the servos, or use a pre-made extension lead. Stick a thick foamed double sided sticky tape (a few layers) underneath the ESC to soft mount, then attach it **lightly** to the motor box using zip ties with the heatsink facing downward and into the airflow (see photos). <u>NOTE:</u> Do not over tighten the zip ties as it will increase vibrations to the ESC.

The ESC battery wires can be trimmed as needed and passed through the bulkhead next to the battery tray.
Connect the three motor cables to the ESC. The RX lead can be twisted to reduce RF noises.

Verify the correct motor rotation direction (should spin clockwise from pilot view).
If it doesn't, power down the ESC and swap the position of any two motor cables or reprogram your Quantum ESC for reversed rotation. We strongly recommend removing the propeller as a safety precaution before powering up the ESC.
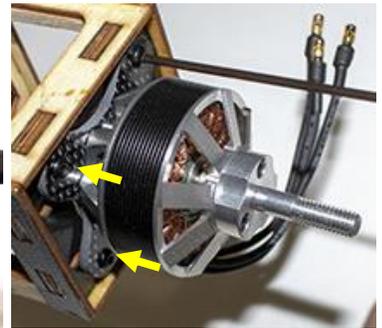

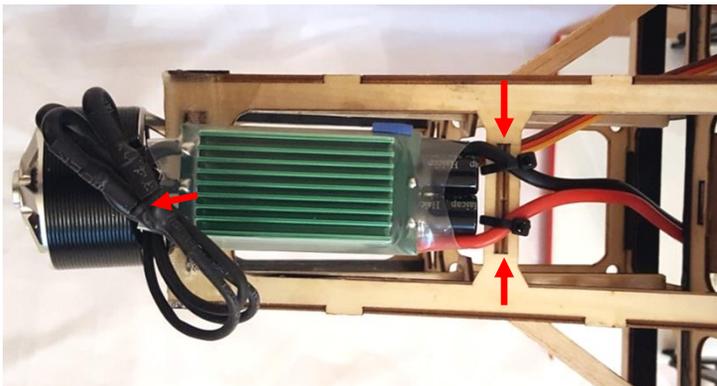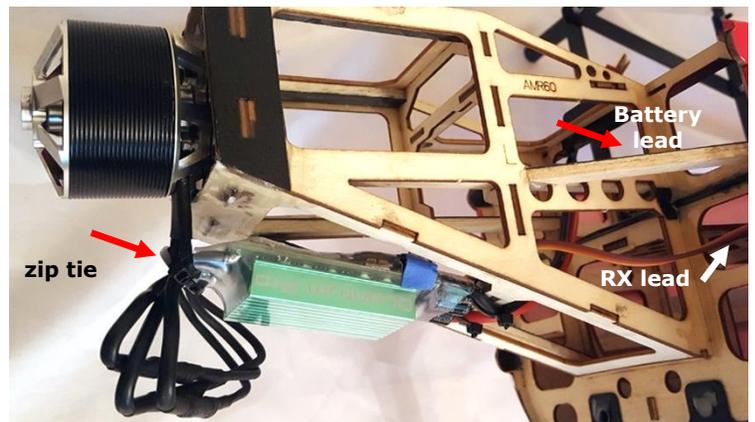| Install air baffles | Apply Loctite to the retaining bolt | Bolts head must NOT protrude | X mount bolts |

Using CA, assemble the supplied balsa air baffles and glue them to the sides of the motor box to improve airflow to cool the motor/ESC/batteries.

ESC installation (zip ties)

NOTE: Install the motor with the cables positioned downwards