At Precision Aerobatics, we developed the Ultimate AMR to deliver an aircraft unlike any other. Using advanced production techniques, including our revolutionary PA FiberFusion® construction, we created an airframe that is exceptionally light yet extremely strong.

Strategic carbon fiber reinforcement and meticulous weight reduction make **the Ultimate AMR 60 the lightest bipe in its class**, with very low wing loading and outstanding flying characteristics.

Through extensive flight testing, we evaluated numerous equipment combinations and identified a direct link between the drive system and overall performance. To ensure the aircraft flies exactly as intended by our designer and test pilots, we developed our Integrated Performance Airframe-Drive Systems® (iPAs®).

iPAs Set up
when performance matter!

Each iPAs component has been selected based on extensive flight testing to ensure optimum performance, reliability, and handling, with many parts designed or modified specifically for the Ultimate AMR.

All demonstration videos found on our site feature aircraft equipped with an iPAs® setup.

Deviating from these recommendations may result in reduced performance and altered flight characteristics.

The Ultimate AMR is designed to deliver maximum performance without oversized, expensive power systems. Our recommended iPAs setup gives you strong, efficient power, long flight duration, and a perfectly balanced feel. It's lighter, more responsive, and easier on batteries and electronics than typical setups in this class. If you want the aircraft to fly exactly as intended — this is the system to run.

visit PrecisionAerobatics.com for more information

Specifications

Wing span - 52"/1320mm **Length -** 56"/1421mm **Wing loading** - approx 12.4oz sq ft!
Wing area - 900 sq inch **Flight weight (inc battery) ~** 77.6oz / 4.85 Lbs / 2200gr

Motor	**PA Thrust 60 Revo**, 24-pole Outrunner with Rotorkool® Technology | 213g brushless motor PA Item #AC-1887 with Carbon Fiber X mount. *Using a motor larger or more powerful than specified may damage the motor box or result in airframe failure.*
ESC	**PA Quantum 80A Evo** ESC PA Item #AC-2190Evo
Battery	**PA Gen2 LiPo 6S pack** 22.2v 2600mAh 30-60C PA Item #AC-2359
Servos	**4 of Nexatec NXT 200HV** servo PA Item #AC-2377-4
Propeller	**Vox 16×7 Propeller** PA item # AC-2116 This propeller produces maximum propwash, delivering exceptional control in slow 3D and rolling harriers. It's an excellent all-around choice, offering outstanding 3D stability and is highly capable in high-energy maneuvers
Radio	6 channel lightweight receiver
Carbon Fiber Spinner	**PA 2.17" Ultimate Style CF Spinner** (CNC Machined) PA Item # AC-2219 Factory pre-cut, this ultra-lightweight carbon fiber spinner features a premium high-gloss finish. Each unit is individually tested in-house to guarantee it spins centered and true for vibration-free performance.
Carbon Fiber Vortex Gen	**AMR 60 Carbon Fiber Vortex Generators** PA Item # AC-2344 These CNC-machined VGs complete the Ultimate AMR 60 aerodynamic profile, providing a more "locked-in" feel. They are essential for maximizing stability in slow, high-alpha 3D flight and improving precision during Knife Edge tracking.
Carbon Fiber Servo Arms	**PA Carbon Fiber Servo Arms** (# AC-2347) These CNC-machined lightweight arms are essential for achieving the perfect geometry and full control throws required for 3D flight.

iPAs Integrated Performance Airframe-Drive System

Precision Aerobatics AMR 60 Version 2

What's new in this version?

• Two new captivating color schemes (classic schemes available too)!

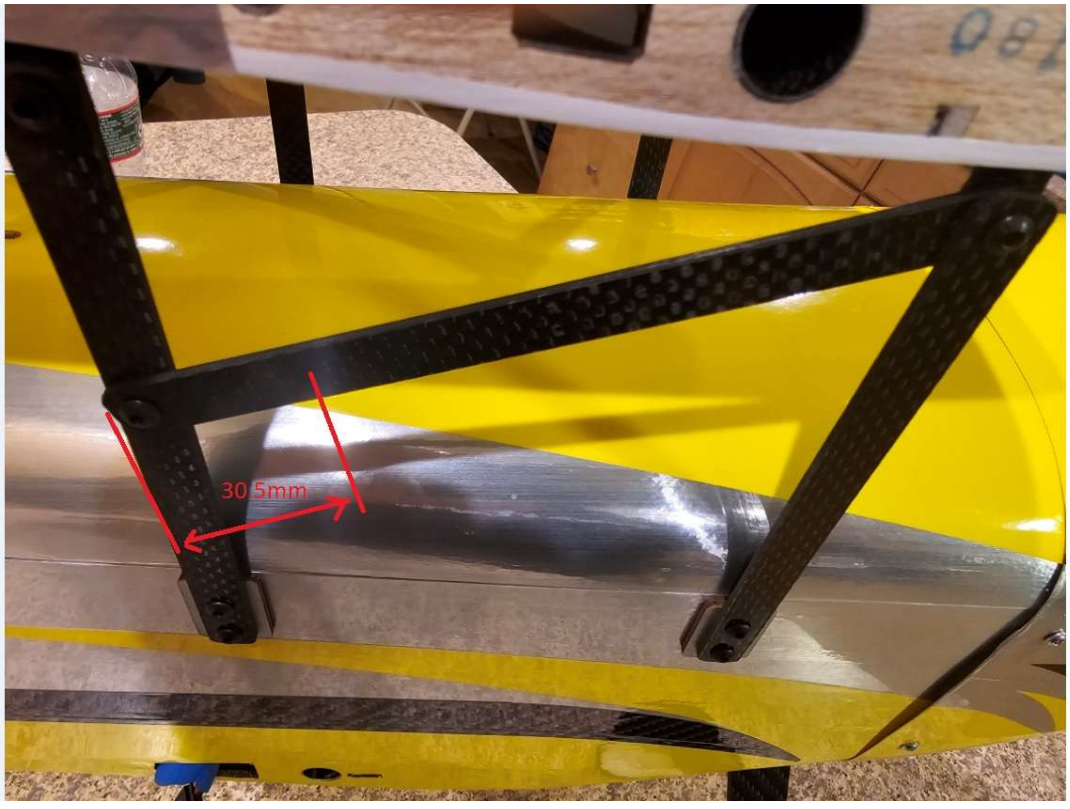
• Ailerons size increased by more than 30% for even more aggressive 3d performance and enhanced roll rates.

• Multiple construction changes in different areas for a refined production precision, result in a stiffer, stronger, and more precise plane.

• New CF servo arm design, updated control horns and reinforced wing strut promote maximum wing stiffness which leads to better precision and better tracking during high-speed flight!

• Now with maximum response and wing authority, we are pushing the AMR 60 flight envelope even further! The Ultimate AMR 60 V2 is unquestionably, the most refined and capable biplane on the market!

Some kits in the recent batch are missing the CG drilled hole (not all of them). If yours is missing it, here's how to resolve it:



Congratulations on your purchase of Precision Aerobatics

ULTIMATE AMR 60

Ultimate Precision, Ultimate 3D

Warning – This is not a toy!

Be sure you have read and understood this entire manual before you assemble this model

Do not overlook the warnings and instructions enclosed herewith or those provided by other manufacturers, and the official AMA (Academy of Model Aeronautics) Safety Code (see at the end of this manual). They were designed to assist you in preventing damage or injury.

The instructions below are our suggestions only on how to assemble this model. There are other ways and methods to do so.

Precision Aerobatics has no control over the final assembly, the materials and accessories you use when assembling this kit or the manner in which the assembled model and the installed radio system and electronic parts, are used and maintained. Thus, no liability is assumed or accepted for any damage resulting from the use of the assembled model aircraft or from this instruction manual including but not limited to direct, indirect, incidental, special, and consequential damages. In no event shall Precision Aerobatics' liability exceed the original purchase price of this kit.

BY THE ACT OF ASSEMBLING AND OPERATING THE ASSEMBLED MODEL YOU ASSUME AND ACCEPT FULL LIABILITY FOR YOUR ACTIONS.

Radio controlled model aircraft that are not properly assembled, operated and maintained can cause serious damage to body and property. If you are not an experienced pilot and airplane modeller you must use the help of an experienced pilot or preferably an authorized flight instructor who will assist you with the assembly and flying of this model.

SAFETY NOTES:

1. Before assembling and flying this model read carefully any instructions and warnings of other manufacturers for all the products you installed or used on your model (especially radio equipment and power source).
2. Check thoroughly before every flight that the airplanes components are in good shape and function correctly. If you find a fault do not fly the model until you have corrected it.
3. Radio interference caused by unknown sources can occur at any time without notice. In such a case, your model will be uncontrollable and completely unpredictable. Make sure to perform a range check before every flight. lf you detect a control problem or interference during a flight, immediately land the model to prevent a potential accident
4. Youngsters should only be allowed to assemble and fly these models under the instruction and supervision of an experienced adult.
5. Do not operate this model in a confined area.
6. Do not stand in line with, or in front of a spinning propeller and never touch it with any object.

Precision Aerobatics quality control team checks each plane before it leaves the factory to ensure that each kit is in fine condition. We have no bearing on the condition of any component parts damaged by use, modification or assembly of this model. Inspect the components of this kit upon receipt. If you find any parts damaged or missing, contact the hobby shop who supplied this kit immediately. All warranty claims to be submitted within 30 days of purchase and include the original dated receipt. This warranty is extended to the original purchaser only. We do not accept the return or replacement of parts on which assembly work has already begun. Precision Aerobatics reserves the right to change this warranty at anytime without notice.

NOTE:
Although we have done most of the work for you and not much assembling work left in completing the model and getting it ready to fly **we urge you to read the manual thoroughly.**
We have spent weeks in preparing the manual making it as detailed as possible, and you will find in it many tips and suggestions that will help you get the most out of your plane, in the safest way possible.
We hope you'll find the manual helpful and that you'll enjoy your new model.

Precision Aerobatics Team

Congratulations on your purchase of the AMR60. After building a few AMRs in different ways and sequences, I found the following sequence and methods to be the smoothest and easiest for you. A lot of work and effort was invested into this manual so please put the time to read and follow it to get the best results. I hope you enjoy your new AMR60 as much as we do.

Shaun Vanunu
PA Designer/Chief engineer

Equipment selection

At Precision Aerobatics we have gone to great lengths developing the Ultimate AMR 60 in order to provide you with an aircraft like no other. We have used unique engineering and untraditional production techniques, including our revolutionary PA FiberFusion® to create the lightest, strongest aircraft possible. The extensive engineering and usage of carbon fiber along with our never ending quest to reduce weight ensures the Ultimate AMR60 is like no other aircraft in its class. These factors contribute to the outstanding flying characteristics of the Ultimate AMR60.

Throughout our extensive flight testing program we have trialed many different combinations of equipment in order to obtain the best possible performance from the airframe. We noticed a direct relationship between the drive system chosen and the aircraft performance and handling characteristics. It is our desire that your Ultimate AMR should have the same amazing capabilities as our designer envisioned and test pilots experienced. For this reason we have developed a number of our own **Integrated Performance Airframe-Drive Systems®** or **iPAs®**.
Note: All the flying videos available on our website use, exclusively, the iPAs recommended gear which can give you a good idea on the high performance you can achieve.

The Ultimate AMR 60 was designed around the following gear. Please be aware that any deviations from these recommendations will result in degraded flight characteristics.

Each iPAs incorporates the following equipment. Please be aware that any deviations from these recommendations will result in degraded flight characteristics.

- **Motor** - PA Thrust 60R with Rotorkool® technology (PA Item #AC-1887) brushless motor (using a motor that is larger or more powerful than that specified can result in damage to the motor box or failure of the airframe).To find more details on the Thrust 60R visit our website. Note that when buying the motor with the airframe you are entitled to get at no extra charge CNC machined carbon fiber X mount, made to suit the Ultimate AMR 60.
- **ESC** - PA Quantum 70A Pro Programmable Brushless ESC with built in HV selectable Switching BEC (PA Item # AC-2190HV).
- **Batteries** – 2 packs of PA 2600mAh 25-50c 3S (11.1V) Lithium Polymer (Item #AC-2336) connected in series to create a 6s pack (22.2v), or a single 6s pack in equivalent weight of approximately 400gr. On our website you can find bundles of 2pak and 4paks at a discounted package price.
  Note: different batteries will vary the motor's output and amp drawn and might push the motor beyond its limits. If using none-PA packs use a watt meter to verify that the output power and amp drawn are within the Thrust 60R range with the specified propeller. **Connectors** – use original Ultra Deans plugs only. We found that using cheap copies can cause problems of conductivity and restriction of higher current flow resulting in serious loss of power.
- **Servos** – We recommend four NXT-90HV servos or similar quality digital mini Servos all around.
- **Extension lead** – German made, thin gauge flexible extension lead for EP models 2M/ 6.5ft (PA item # AC-1713).
- **Micro Receiver** – Four or more channels full range FM or PCM or any full range 2.4Ghz (e.g. Spektrum AR6210 receiver).
- **Propeller** – It is essential to allow good air flow (using the supplied air baffles and installing the gear per the instruction manual) over the motor, ESC and batteries regardless of chosen propeller. Please refer to our website for the prop selection.

  Warning: Plastic APC "E" propellers of equivalent sizes are **NOT recommended** for any of the PA planes as they generate a lot of vibrations being out of balance. They also flex and will draw much higher amps compared to the Vox props at the same sizes being less efficient. Using them instead of the recommended Vox propellers can lead to a motorbox failure!!

DISCLAIMER - AIRFRAME LIMITATION

The AMR60 is designed for extreme aerobatics and 3D maneuvers and has robust construction that was thoroughly tested. However due to the extreme thrust produced by the Thrust 60R, the low flight weight of the model and its large control surfaces, it is vital for the user to exercise discretion while executing high stress maneuvers so as to avoid over loading the airframe.

EVERY airframe may it be an RC model or a full scale aircraft has its maximum limits. Your AMR60 is not an exception. The AMR60 is also specifically designed to operate using the recommended gear described above. Keeping within the design limitations greatly depends on your flying style and IS YOUR RESPONSIBILITY. Please read the Official Academy of Model Aeronautics National Model Aircraft **Safety Code** at the end of this book.

Pre-Assembly

Before you commence assembling please inspect the contents of the kit for any damage that may have occurred during transport or a suspected manufacturing defect. If you suspect any component is damaged please contact the shop from which you purchased the model immediately. Do not commence the assembling of this kit.

We go to great lengths to ensure all components are manufactured free of warp or twist, however, due to high temperatures on the long journey in a container and changes in humidity it is possible for small amounts of warp or twist to develop. It is important at this stage to inspect for warp. Start by taping the ailerons in the neutral position at the wing root and look down the length of the ailerons to ensure they are perfectly straight. The ailerons should be neutral at the wing tip (profile view), as they are at the wing root. If the aileron appears to be either deflected up or down at the tip (known as wash-out or wash-in), it must be removed by gradually twisting in the opposite direction and carefully applying heat to the wrinkles on the covering film (ideally with a hobby iron). Start at a very low temperature and gradually increase until the wrinkles begins to shrink. Different films respond to heat in different ways and excessive heat will damage the covering. Repeat this process until the aileron is perfectly straight with no twist visible. Do **NOT** use a heat gun as it affects a much greater area which may cause an unwanted warp in other areas and burn the covering.

Inspect all sharp edges of the covering trims to verify they are sealed down. If there are loose edges that peel off, use an iron to lightly seal them down, especially pay attention to wing and elevator tips (trailing edge & leading edge).

Ensure the elevator is not twisted by checking that both elevator counterbalances line up perfectly with the stabilizer leading edge. If one counterbalance is slightly deflected up or down while the other side is neutral, the slight twist can be removed in the same manner as the ailerons by gently twisting in the opposite direction and applying heat to the film where it wrinkles. It is important to ensure that this step is completed prior to installing the stabilizer/elevator on the model.

Any small bubbles or wrinkles in the covering film can also be removed with a small hobby iron, **however extreme care must be taken, as it is possible to introduce warp to an otherwise straight part while removing wrinkles.** Start at low temperature and gradually increase it. Use the iron **front tip** and **only** over the wrinkles to avoid warping other areas! Avoid using a heat gun as it spreads the heat over a large area and can easily cause twists and warps.

Tip: As most parts of the AMR60 will be assembled using epoxy, it is recommended to have some Denatured Alcohol (methylated spirits) and paper towels handy for the occasional quick clean ups during the build.

Note: If you are having difficulty removing the hatch off the fuselage, it is possible that the radical climate changes caused the magnets to fuse. In this case do not apply excessive force as that can result in breaking the hatch, instead, use a sharp blade to separate them. You may apply a bit of grease into the latch spring and pin for smoother operation.

Avoid keeping the hatch off the fuselage for long periods of time as it may develop some warp due to its length and climate changes. Do not leave hatch/canopy out in the sun as it may warp as well.

Note: Through the manual - all left/right/rear indications are from pilot view

You may also watch "PA Build" videos available on our website, however, don't miss reading this instruction manual.

Making the Openings

Start by ironing around the edges of all the openings to be made to ensure the covering does not peel back later. Next make the following openings in the covering film, as shown in the photos- elevator and rudder servos (cutout one side only), cooling air exit, stabilizer slot and aileron servo bays.

Tip: To prevent making accidental mistakes in the openings, use a pin or blade to pierce a hole in the opaque covering to mark the location of the openings before cutting. You may use a flashlight to find their location.

Note: There are two different sets of servo openings on each side of the fuselage.

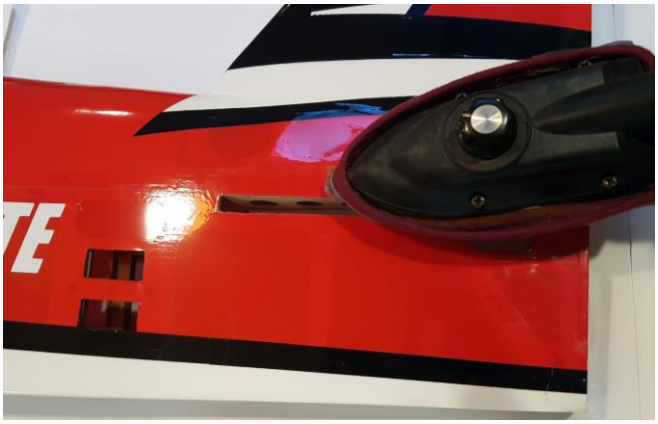
one side with the smaller openings sized for the recommended NXT90-HV(this side has three lightening holes).

With the exception of the aileron servos, the easiest way to make the openings is by 'cutting' the film with the heated end of a paperclip (to heat use a cigarette lighter or a candle) or with a very sharp modeling knife.

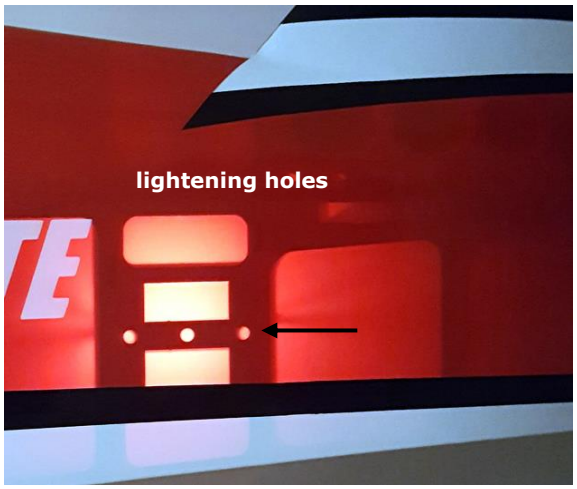
For the ailerons' servo bays, under cut the covering around the bay by leaving a 3mm (1/8")overhang all around then carefully tuck the edges down and seal it with the iron. This will prevent the covering from pulling out and wrinkle in the future. As an option, you may also use this method for the air cooling exit.

NOTE: finding the aileron servo bays through the opaque covering is a bit challenging. If you look closely, in normal room light, you will find the large opening underneath. Due to the reflection avoid using direct flashlight.

Tail servos and Air Cooling Exit

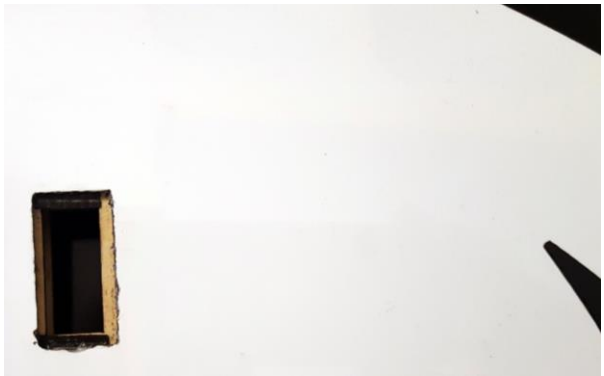


Iron around the edges



Use a flashlight to find the openings

Cut the stabilizer slot



Aileron servo opening

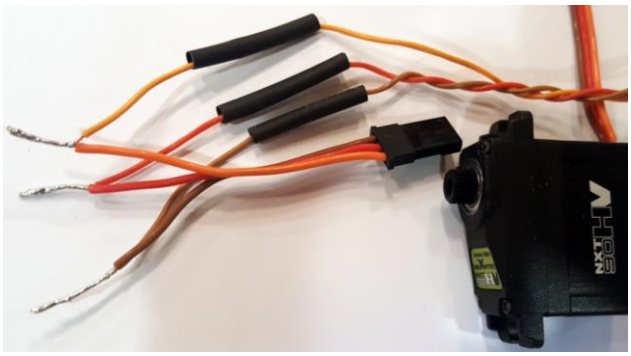
Tail section
Elevator & Rudder servos

The tail servos require a pair of 560mm/22" extension leads (if NXT90-HV is used). We recommend extending the leads using a good quality lightweight servo extension to save on weight, avoid RF noises and voltage drop (PA Item Code AC-1713 is a German made low resistance flexible Extension Lead and is included in the iPAs Pro package).
Cut the servo lead close to the servo case. Expose each cable end, then solder each to the extension lead according to the colors. Insolate the cables with a shrinking tube over **each** of the soldered cables (fit them on before soldering the wires).

Install the tail servos in the opening you previously cut in the covering film with the servos' output shaft closer to the control surface as per the photos.
DO NOT force the servos in as you will cause damage. Slightly enlarge the openings if needed, using a sharp blade to "shave off" a bit of ply. Alternatively, you may use a small flat file. Test fit servos during the process.

Drill mounting holes as required for the screws supplied with your servos using a sharp 1.5mm (1/16") drill bit. Ensure that the screw holes are centered. Use only fully threaded screws.
The servo mounts have ply doublers glued on the inside of the fuselage; therefore applying a drop of CA into each hole is not actually required (however this can be done should the screws become loose). Run the servo leads along the bottom of the fuselage and through the bulkhead as shown in the photo.

Tip: Carefully "tap" the screws in by making a full turn in and then backing out by ¼ turn and repeat until the screw sits fully in.



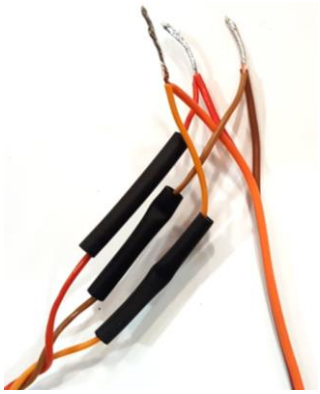
Tail extension leads

Rudder and Elevator servos

NOTE: Do not use a zip tie on the extension leads so they can be easily pulled out in the future if needed.

Warning - we recommend **not to use** the rubber grommets and eyelets supplied with some servos as this method of mounting will introduce excessive flex of the servo case under flight loads and will cause a lost of resolution in control ("blowback" of the control surface). The best method is hard mounting of the servos (tail and aileron servos) with aftermarket screws without the grommets and eyelets.

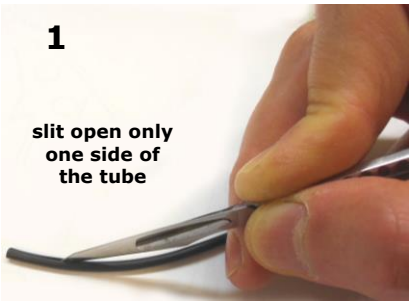
PA Lightweight servo extension

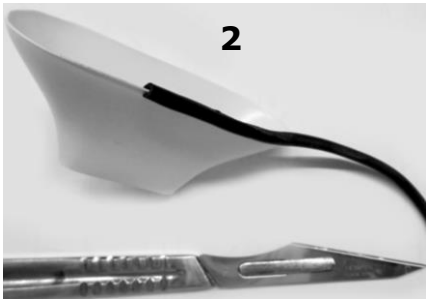


Solder and insolate each cable

Landing Gear (LG) cuffs

Using a sharp modeling knife on a solid surface, slit open the supplied black tube to its entire length, then push it onto the top edge of the cuff all around (starting in the center of the inner side). Apply one drop of CA to secure it in and continue to tuck it in all around the lip.
Note: To prevent glue from running over the cuff, apply a drop of CA from the inside of the cuff.
Tip: before gluing the tube, test fit the LG cuff to the fuselage with the cowl on and see if it needs a bit of trimming to fit the natural shape of the fuselage and cowl leaving minimal gap.



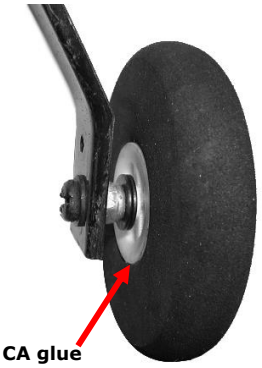


Landing Gear struts

before installing the wheels, fit the LG cuffs onto the struts and leave them loose for now (they will be installed at a later step)

Install each wheel onto the CF landing gear strut using the black M4x25mm bolt/axle in the pre-drilled hole. The order of hardware is: M4X25mm Bolt/M4 washer/CF strut /M4 lock nut /2x M4 washers /wheel/ M4 lock nut. The wheel should be captured between the washer and the lock nut tight enough to still allow free rotation of the wheel. If the nuts are too loose the wheel is likely to wobble and is more prone to damage or scuff the wheel pants. Verify that the tires are firmly glued to their rims. Apply a little bit of thin CA around the perimeter of the rims if required to keep them firmly in place. You may use some temporary Loctite on the outer nut to prevent it from fastening or loosening after time.

LG cuff



Wheel Pants

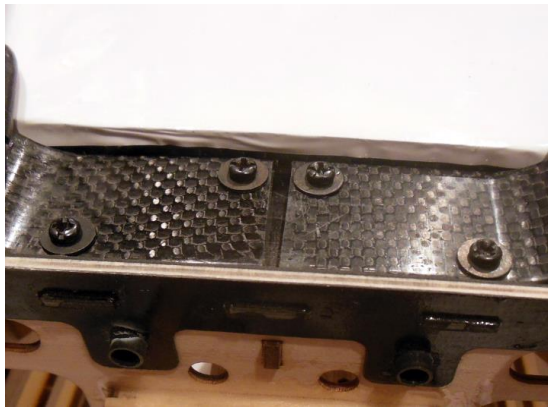
First, differentiate between the left and right hand side of the LG struts by placing them on the fuselage LG plate mounting holes. Position the fiberglass wheel pants over the wheel at the height you desire. If flying off grass, mount the pants higher leaving more wheel exposed and if flying on a sealed surface, the wheel pants can sit lower. Once satisfied with the position, mark the location for the self-tapping retention screw (2.3x10mm screw with soldered washer) of the wheel pant and drill, using a 1.5mm (1/16") drill bit. Attach the wheel pant to the landing gear strut using the self-tapping screw but DO NOT apply excessive force while doing so as this risks shearing the screw's head off. Rather "tap" the screw in gradually and if it becomes too tight, remove it and slightly enlarge the hole in the LG strut. Take care that the wheel pants are both mounted at the same angle and height; we made a perfect recess to make it extremely easy for you.
Remove the retaining screw and cut off (using cutters or Dremel tool) its sharp edge so it will not hit the wheel, then apply a drop of thin CA glue into the hole to stiffen the thread. Once the glue has cured, install the wheel pants with the screws.
Note: if the LG strut doesn't fit into the recess on the wheel pant then light filing of the strut sharp edges may needed.

Installing the Landing Gear

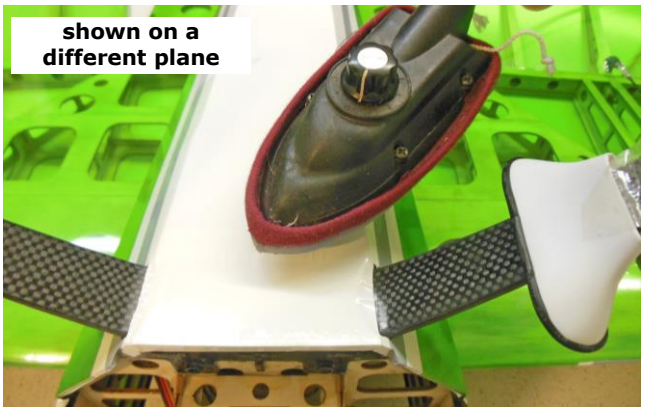
Install the LG onto the fuselage using M3x10mm black bolts and washers. You may apply temporary Loctite to the bolts.
Note: if the LG struts hit the balsa on the sides of the fuselage, use a sharp modeling knife to trim the balsa keeping the gap with the LG to minimum.

Next, if desired, apply the supplied covering film to cover up the landing gear bay.
Tip: Trim the supplied covering to size with approximately 10mm overhang from the bulkhead and behind the landing gear bay. Fold the covering over the edge of the bulkhead and use the covering iron to tack it down. Gently pull the covering at the rear of the bay taut and proceed to tack it down. Once satisfied, seal the edges and carefully shrink the remaining wrinkles.

M3x10mm Mounting bolts



Mount the LG



Apply covering over the LG bay

Elevator & Horizontal Stabilizer

The stabilizer and elevator hinge slots are pre cut. All that is required is to set the elevator deflection and glue the hinges (four large hinges). Start by gluing the hinges into the elevator first (hinges fitted half way in).
To set the elevator deflection, fit the elevator into the horizontal stabilizer all the way in leaving no hinge gap. Ensure the hinges are aligned and centered, then deflect the elevator to approx 60° Deg up and down to set the gap. If the alignment or centering is a bit out, carefully re-cut the hinges' slots to correct as it will affect the flight performance. Ensure that the gap between the tip rib of the stabilizer and elevator counterbalance is equal on both sides. Once satisfied, apply a few drops of thin CA to both sides of the hinges (while deflected) and repeatedly deflect the elevator in a quick pace until the CA sets. Try to pull the elevator off the stabilizer to verify the integrity of the hinges gluing.

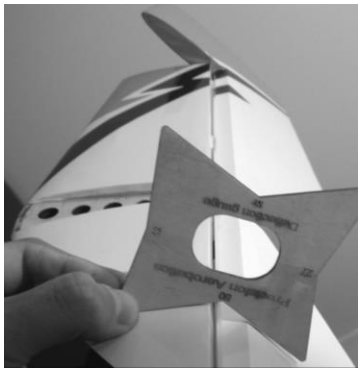
Tip: It's recommended to apply thin CA to the hinges with a pipette tip applicator supplied with your CA bottle to avoid "fogging" the covering. If fogging occurs, it can be easily removed by wiping off with a paper towel dipped in with acetone or nail polish remover.

Take the supplied matched covering strip (according to your AMR60 color scheme) and crease it into a "V" shape. Trim the creased covering to the length of one-half of the elevator. Align it along the hinge line (top side of the elevator). Hold it in place and starting at one end, iron it down along the length of the stabilizer (do not iron to the elevator at this stage). Deflect the control surface to maximum and iron the film into the hinge gap using the point of the iron. Now iron the strip

along the elevator while fully deflected to maximum. This method ensures the gap is completely sealed while still allowing full deflection of the control surface. Do the same with the other elevator panel using the matched strips.

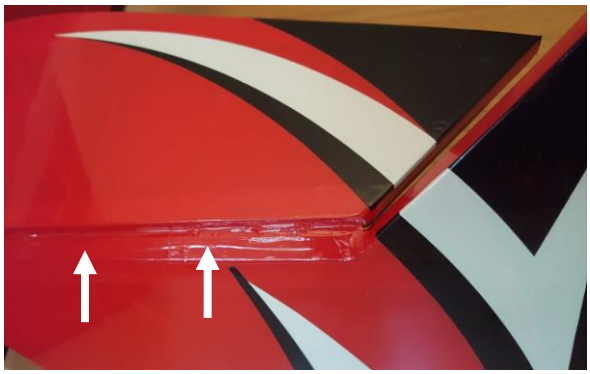
Note: Peel off the translucent protection backing of the strips before using them, otherwise, they will not stick to the surface. If you are unable to, it could well be that it was already removed in the factory.

Sealing the elevator hinge gap is an **extremely** important step and an integral part of the AMR60 design. Skipping this step will have a detrimental effect on the flight characteristics!



Deflect the elevator to approx 60° to set the hinge gap

Gluing the elevator hinges



Place creased covering strip in the hinge gap and iron

Elevator & Rudder control horns

Control horns can be glued at a later step after the stabilizer and rudder are installed to the fuselage, however, it is more convenient to glue them now.

Expose the slots for the elevator and rudder control horns. The rudder pre-cut slot is located 9mm (3/8") measured from the bottom and the elevator 6.5mm (1/4") measured from the root rib.

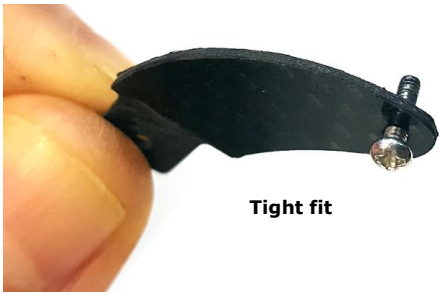
Make sure to cut the rudder and elevator control horn slots in the correct side of your servos final position.
Take the rudder and elevator control horns (refer to the photo below) from your hardware pack to begin preparing them for installation.

Lightly sand the base of the CF control horns to allow better gluing surface. Test fit the CF horns. If the fit is too tight; do not force the horn in. Instead, use a modeling knife to carefully enlarge the opening until a perfect fit is achieved. Do not epoxy the CF horn at this stage.

Use the M2x8mm bolts and nuts to install the ball links to the control horns in the **correct orientation** as shown on the photos. Control horns' holes are slightly undersized. Use a fine needle file carefully to **slightly** enlarge the hole to get a precise slop-free fit. Test fit the mounting bolt a few times during the process. **Take your time** to do so because an oversized hole would cause undesired slop/play. Later, do the same with the CF servo arms' mounting holes.
The order of assembly is M2x8mm bolt/ball link/CF horn/nut. **Apply Loctite and fasten firmly to secure the nut.**
AMR60 is a competition class plane so take your time to do things right and have better precision in flight.

NOTE: Two of the supplied ball links have a smaller diameter hole in the plastic. These are designed to be used with the aileron ganging metal couplers as they will be self threaded tightly later on. These ball links and metal CNC machined couplers are packed in a separate plastics bag labeled "ganging pushrods". It is advisable to keep these two aside at this stage! All the other ball links will be glued onto the CF pushrods.

File mounting hole

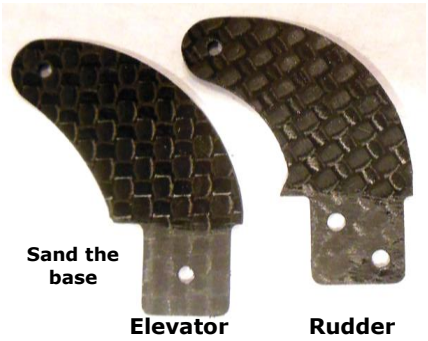


Tight fit

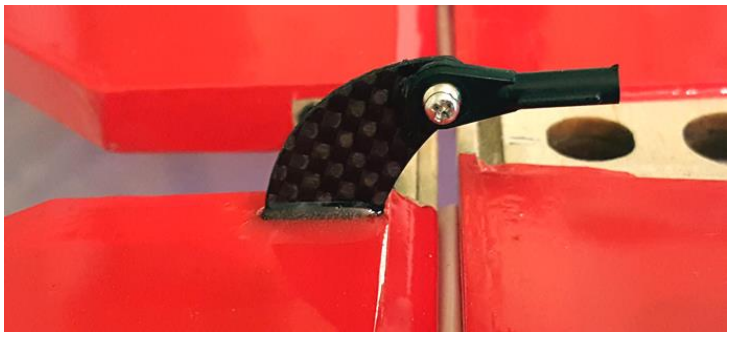
Test fit bolt

Install ball link

Secure the bolt with Loctite



Rudder control horn


Leave the epoxy excess

Elevator control horn

Next, use epoxy over the control horn base and inside the slots to glue the CF horns in and ensure that the horns were inserted **all the way in** and are perfectly 90 degrees perpendicular to the control surfaces. There will be a bit of epoxy excess once the control horns are slid into the slots. Do not wipe it off as it will create a solid base to the horns. IF needed, use a piece of masking tape to hold the CF horns in position until the glue sets. Ensure adequate epoxy is applied to fill up the holes at the base of the horns (once dry it acts as fixation pins).
Note: epoxy allows time for adjustment after the horns have been inserted while CA is prone to set too rapidly and may also cause stains to the covering film.

The stabilizer inserts into the fuselage slot from the rear which requires the removal of the balsa at the rear of the slot. This is best done with a sharp hobby knife or a fine hobby saw. Use a ruler to draw a line extending from the slot to the rear to mark the area to be cut off.

Iron down the covering at the area to be cut and with a sharp blade or fine saw, carefully cut the balsa out. Tape the elevator in neutral position. Insert the stabilizer all the way into its slot, until the elevator leading edge hits the rear of the fuselage. While elevator is in neutral position you can easily mark the final lines to cut in order to allow the elevator to fit through. If the fit at the newly cut slot is tight do not use force. Merely widen the slot evenly using a file until the stabilizer slides through. Proceed to slide the stabilizer until it reaches the stop at the front end of the stabilizer slot in the fuselage.

Next, you will need to align the stabilizer. Temporarily insert the wing tube to the fuselage. Looking from the rear check that the stabilizer is parallel to the wing tube and 90° to the fin.
If the stabilizer is not parallel to the wing tube, remove the stabilizer and lightly file the fuselage slot to achieve perfect alignment. The stabilizer, after filing, must sit parallel to the wing tube.
Tip: If you have difficulty to visually check the stabilizer alignment with the wing tube, temporarily install the wings (with the ailerons taped in the neutral position) to make the visual reference.

At this stage fully deflect the elevator UP and DOWN to verify there is no obstruction; If any, slightly file the fuselage opening (ONLY as needed) to allow the full deflection.

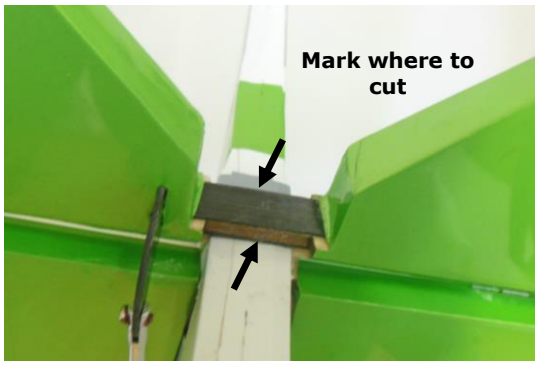
Once the stabilizer is in perfect alignment, remove it and apply a thin layer of 30 minute epoxy or wood glue to the exposed balsa in the center of the stabilizer (both sides) and on the side of the stabilizer roots (Note: CA is not recommended here as it causes discoloration of the covering film and set too fast). Insert the stabilizer ensuring it is

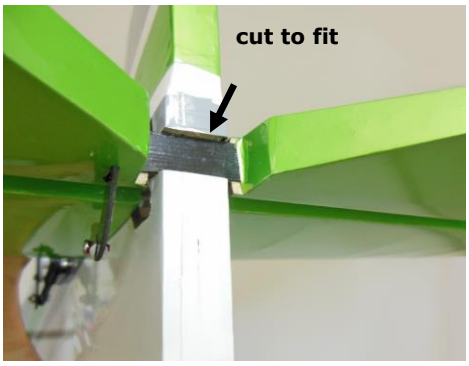
pushed fully forward into its slot and make a final check from all angles that the stabilizer is correctly aligned. If there is any gap between the stabilizer roots and fuselage make sure to keep an even gap on both sides before letting it cure. Use masking tape to hold the stabilizer parallel to the wing tube until the epoxy sets. Check and double check to ensure the stabilizer is absolutely parallel to the wing tube. Use a paper towel soaked in denatured alcohol (methylated spirits) to wipe off epoxy excess. Stabilizer root ribs will keep the correct position of the stabilizer so no alignment measurements are needed to be done.

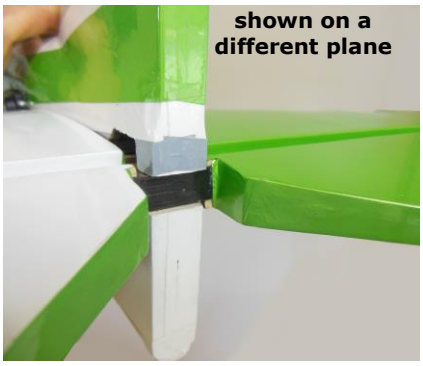
Note: While gluing the horizontal stab, it is extremely important not to place any pressure on the fuselage. Doing so can result in the fuselage being glued with a permanent twist impairing the flight performance.

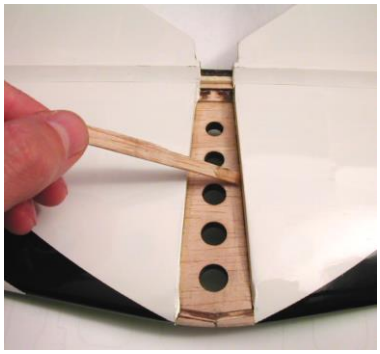
Once the glue sets, remove the masking tape and slide the supplied balsa wedge into the gap you previously cut at the rear of the fuselage. Being oversize, you need to lightly sand the balsa wedge (all around) until it fits flush with the fuselage. Do not attempt to force the wedge in as this could risk inducing a permanent twist in the fuselage (as with the stabilizer). Once satisfied, glue the wedge in with CA. You may use scraps of covering material previously cut to cover the balsa wedge.

NOTE: If you are an advanced pilot who is looking for an extreme elevator deflection of 60°+, follow this step:
fully deflect the elevator UP until the tube hits the fuselage. then use a small round file to make a tiny notch (on each side of the fuselage) for the tube clearance. That is inevitable due to the unique construction at that spot and can only be done by the modeler during the assembling. Use the supplied deflection meter in this step.

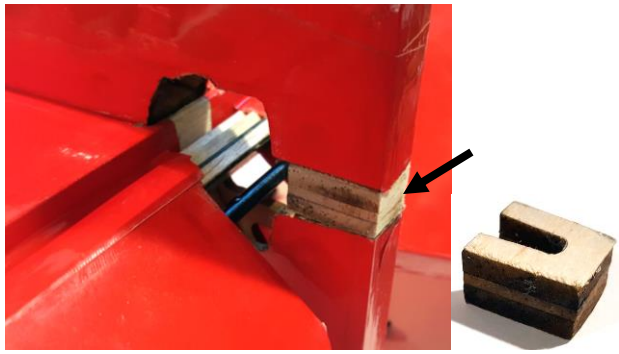






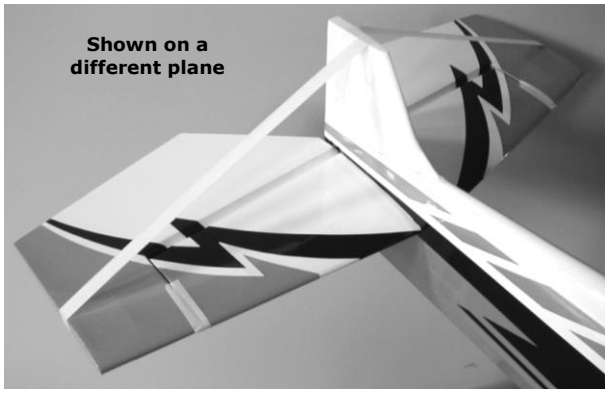


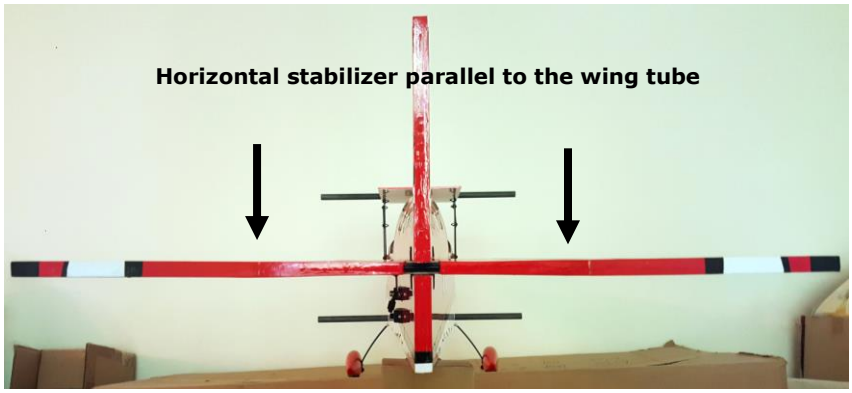
Apply epoxy to the stab center



Glue in the balsa wedge

apply covering over





Fully deflect the elevator UP

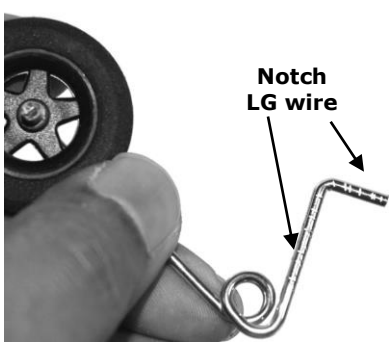
File a notch for the tube

Rudder and Tail Landing Gear (LG)

Locate the groove at the bottom of the rudder closer to the hinge line. Using a sharp blade, remove the covering to expose the groove. Test fit the tail LG in the groove, and mark the position of the hole to drill for the wire to fit in.
Drill a hole in the marked position using a 1.5mm (1/16") drill bit. If tail LG strut doesn't fit into the groove use a fine file to slightly widen it. With the LG in place verify its alignment with the rudder and if needed correct it by bending the strut with pliers before glued in.

Create indentations in the surface of the LG wire using a file/Dremel tool. The indentations provide better surface for the glue to bond.

Flood the groove with 30 minutes epoxy and install the LG into the slot. Apply another thick layer of epoxy over the LG wire. You may lay a small piece of fiberglass cloth or scotch tape over for additional reinforcement. Leave the assembly aside until the epoxy sets. Note: if the wheel doesn't spin freely, wobble it a bit until it spins freely.



The fuselage/fin and rudder come with the hinge slots pre-cut at the factory. On gluing the rudder into the fuselage – fit the hinges into the rudder first (one large on the bottom and two narrow ones at the top). If they don't fit in easily or slightly off centered, use a sharp modeling knife to CAREFULY re-cut the hinge slots (avoid widening them as that can cause them to detach in flight if thin CA is used to glue them). Before applying glue, place the rudder side by side with the

fuselage and check the alignment of the hinges with the fuselage slots and readjust hinges if needed. Use a sharp modeling knife to carefully lengthen the slots IF needed, but make sure not to over do it. Once satisfied, apply a few drops of thin CA over each hinge to glue them to the **rudder** and let it cure. Then test fit the rudder into the fuselage all the way in, align the rudder counter balance with the fin leaving a small gap that allows the rudder to deflect freely, then place the fuselage on its side and fully deflect the rudder until it hits the elevator (elevator must be in neutral position. If needed use a sticky tape to hold it in neutral), then apply a few drops of CA to both sides of the hinges to fix them permanently in place.
Note: Try to pull the rudder out of the fuselage/fin to verify the integrity of the hinges gluing. Properly glued hinges will not allow the rudder to detach.

Next, seal the hinge gap with the supplied strips, to match the color scheme, in the same way you did with the elevator. The strips should be applied from one side only, to your preference, and trimmed to match the color scheme.
This step is equally important for the rudder as it is with the elevator.

Once the rudder is installed, it must be checked for warp (rear pilot view).

Note: although we fix warps on all parts after the covering process, due to the lightweight construction of the rudder it is normal for it to have some small amount of warp that occurred during the long journey in the container and to your doorstep. There is no need for concern as this can be easily removed.
Note that to guarantee a warp-free rudder would have meant deliberately beefing up the internal structure of the rudder which would then result in an unacceptable control surface weight penalty.

Tape the rudder in the neutral position and look from the rear to verify that the trailing edge of the rudder is perfectly vertical. If it twists to one side, carefully counter twist it in the other direction and apply heat where it wrinkles using an iron as you did with the ailerons and elevator. Continue until the trailing edge of the rudder forms a perfectly centered vertical line.

TIP: When sealing the rudder hinge gap you may skip the small black pieces and instead apply a longer colored strip (yellow or red according to your AMR color scheme) then use a black marker to complete the missing trim.


Deflect rudder to maximum before gluing the hinges

Seal the entire hinge gap while rudder is fully deflected

Small imperfections can be fixed using a black marker

Rudder hinges

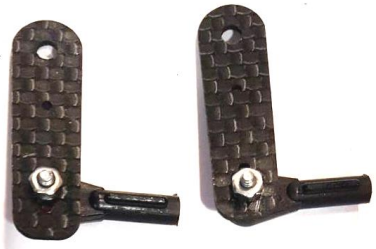
Elevator & Rudder control linkages

With the servos centered in neutral, temporarily install the plastic servo arms. Find the best position of the servo arm which yields 90 degrees to the servo case. That ensures linear and symmetrical throws in both directions without the need of excessive TX sub-trims and servo travel adjustments to one direction. Once satisfied, cut off the other three unused arms using a nail clipper or cutters.

In order to achieve maximum control throws for 3D and to ensure proper linkage geometry we recommend using PA AMR60 Carbon Fiber servo arms (PA Item Code AC-2346). Note that these are not included with the kit. If you have them, install them now. You may wish to do so for the aileron servos at this point too.
The CF servo arms' hole is also slightly smaller to achieve a tight slop-free fit. You may need to enlarge the hole a bit to fit the ball link M2x8mm bolt as you previously did with the control horns.
For correct linkage geometry use the CF servo arms and install the **elevator** ball link in the **outer** mounting hole of the arm while the **rudder** one in the **inner** hole. Ball links **must be** installed on the **bottom side** of the servo arms.
NOTE: Any deviation from this setup will affect the performance or even overload your servos!
The order of assembly is M2x8mm bolt/ball link/CF arm/nut. **Apply Loctite and fasten firmly to secure the nut.**

NOTE: It is important to trim off (with a nail clipper or cutters) the plastic tab of the ball link to prevent any friction/binding with the plastic servo arm while swiveling at high angles.

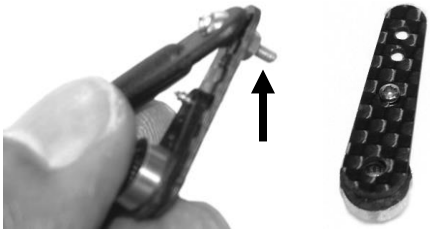
CNC machined CF servo arms



Secure the bolt with Loctite

Notch pushrod end

Trim the tab off the ball link

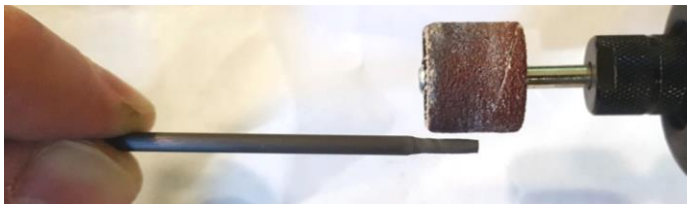


Secure the bolt with Loctite

Tape the rudder and elevator in neutral position then take the thickest diameter CF rudder pushrod (185mm/7.3") and the CF elevator pushrod (140mm/5.5") from your hardware pack to begin preparing them for installation.

The elevator, rudder and ganging pushrods require a little filing/grinding to reduce the diameter for the ball links to fit. Do not enlarge the ball links but rather grind/file the last 1/2" (12mm) of the rod ends (rotate rod while sanding to get an even diameter) to slightly reduce the diameter until it fits. Make small adjustments and test fit frequently until the fit is appropriate for epoxying. Avoid over doing it.

Slightly reduce the diameter of the pushrod ends



DO NOT attempt to enlarge ball links' drills as you will end up damaging or weakening them which may lead to a failure!

Lightly roughen and notch one end (12mm, 1/2") of both CF pushrods using a Dremel disk or small triangle file to ensure a secure glue bond.

With the servo arms installed and centered in neutral (90 degrees to the servo case) and both rudder and elevator taped and held in the neutral position, temporarily insert the CF pushrod into one ball link and line the other end up with the other ball link. Mark and cut short the CF pushrod to fit into the ball link, careful not to over shorten the rod! You may sand/file the tip to obtain an accurate fit. If done properly, you have completed a perfect linkage geometry set-up and will

therefore need very minimal sub-trim adjustment when you set up your TX later. **Tip:** CF rod best cut off with a Dremel cutting disk or sharp modeling knife.

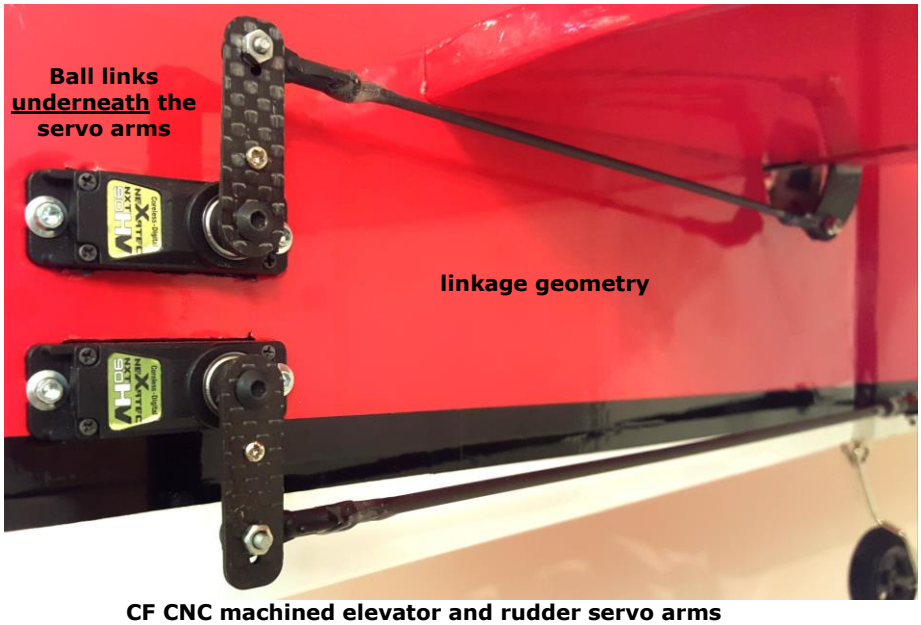
Once satisfied with the precise pushrods length and with the control surfaces already taped in the neutral position, apply 30 minute epoxy to one end of the pushrod and insert it into the ball links while rotating the rods as it helps getting rid of trapped air bubbles. Leave the epoxy excess around the ball links and pushrod joints as it improves the bond.

Before the epoxy sets, verify pushrods to be fully inserted into the ball links, servo arms are in neutral (90°) position, then adjust ball links to be **parallel** to the control horns and servo arms. This step is important and will prevent any linkage binding.

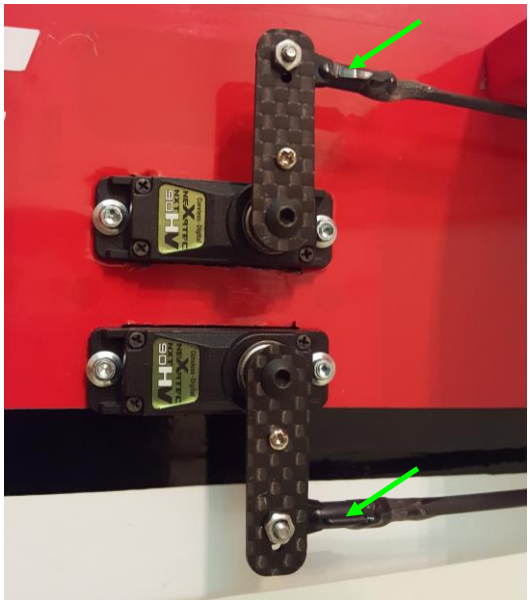
Note: Once the glue sets, fully deflect each control surface and observe the servo arm's ball link. If there is a friction with the arm, use a sharp modeling knife to slightly "shave off" a bit of the plastic mold (see photo).

CF rudder control horn - ball link on top

CF elevator control horn and ball link



CF CNC machined elevator and rudder servo arms



slightly "shave off" a bit of the plastic mold

Motor Box

When assembling your AMR60 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 60R setup.

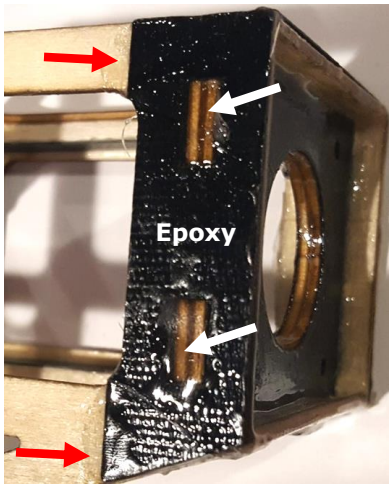
I purposely designed the AMR60 motorbox as a separate part to the fuselage. The main advantage is in case of a mishap or crash, so the flyer is able to replace just the motorbox and not the entire fuselage and tail section, saving a lot of money. It does require a little extra wok but it is certainly worth it in the long run.

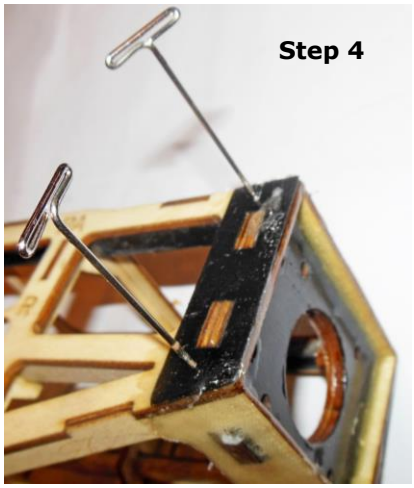
The motor box comes pre-glued, with the correct motor thrust angle built into the pre-drilled firewall.
CAUTION- The motor box has been designed, tested and drilled for the Thrust 60R motor. Using a larger motor or using an improper propeller size or a prop adaptor which is out of true can lead to a motor box failure which will cause damage to your AMR60. For technical data on the Thrust 60R please visit **www.thrustmotors.com** and download the data sheet.

CAUTION- Once glued the motor box is extremely robust, however, following any 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 60R motor.

Go thoroughly 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.

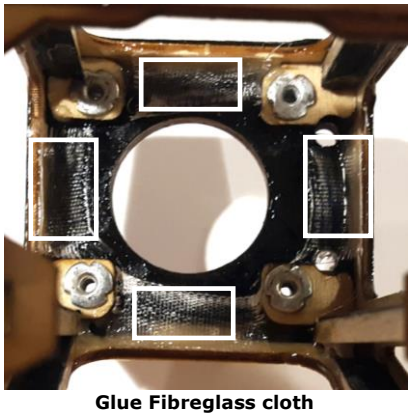




2. Verify with a ruler that the CF stringers do **NOT** protrude the rear of the motor box, otherwise the motor box will be mounted with an incorrect thrust angle which will impair the AMR60 flight performance, therefore, if needed, sand/file the rear ends of the stringers flush with the motorbox ply.

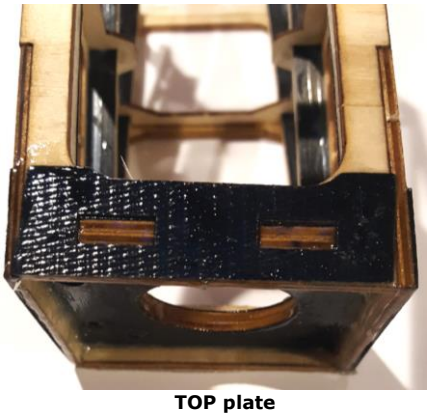
3. Cut the supplied fiberglass cloth to fit the four inner sides/corners of the mounting plate (see photos).

Apply/brush epoxy along the seams of the mounting plate (top bottom and sides) including corners. Then place the fiberglass cloth over each seam/side (**keep blind nuts clear of epoxy**) and brush a thin layer of epoxy over it to soak in.
Using a flat tool, tuck in the cloth into the seam leaving no gap with the ply. Let it dry.
Note: Leave any overhanging fiberglass cloth as it will be trimmed later when dry. You may slightly dilute/thin the epoxy by adding a bit of denature alcohol into the mix. Thinner epoxy is easier to brush, however, it's not a must.



Glue Fibreglass cloth

Tuck in fibreglass cloth into seams

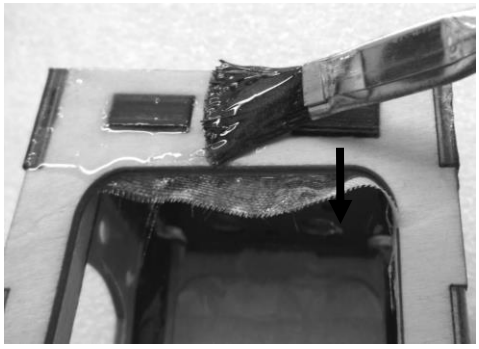


TOP plate

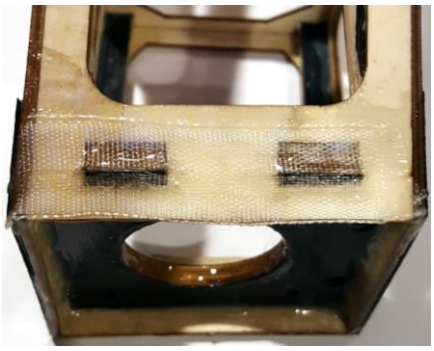
Side plate

4. Locate the supplied composite plates and place them over the motor box sides in order to differentiate LEFT RIGHT and Top hand side. 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 the plate and the motor box 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.

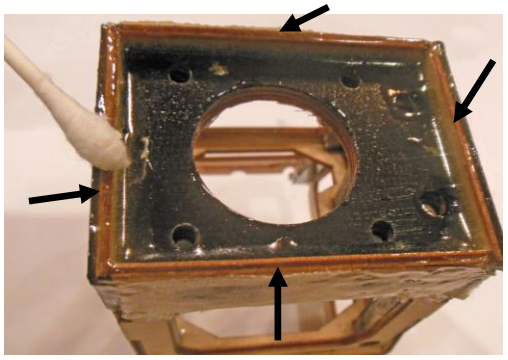
5. Cut to length the remaining fiberglass strip to fit the bottom side. Brush epoxy over the outside bottom side including corners. Then place the strip over and brush a thin layer of epoxy on top to soak in. Using a flat tool tuck the wet cloth into the seams and corners leaving no gap with the ply. Let it dry. Continue by brushing a bit of epoxy over the front frame.



Brush epoxy



Place fiberglass strip over and brush epoxy on top

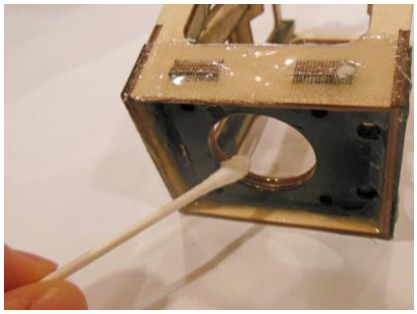


Epoxy over the front frame

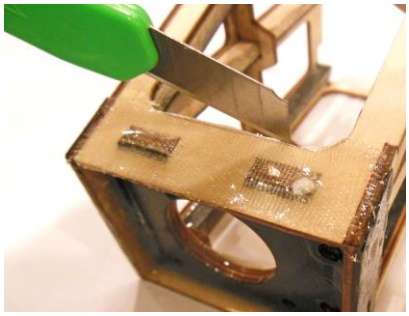
6. Using a cotton swab apply a thin layer of epoxy in the mounting plate vent holes except the mounting bolts' holes. wipe off any excess where the motor will be mounted.

7. Once epoxy is fully dry, use a sharp modeling knife to trim off any overhanging fiberglass cloth.

8. 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.



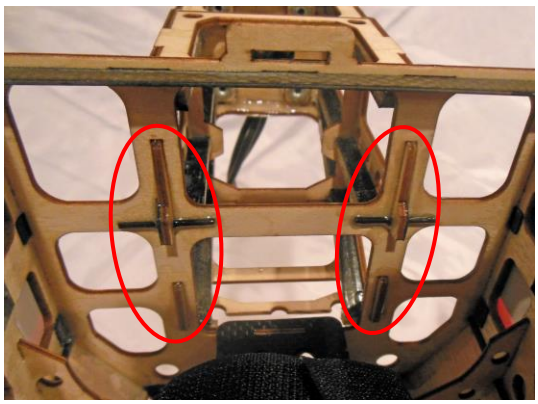
Epoxy in ALL vent holes



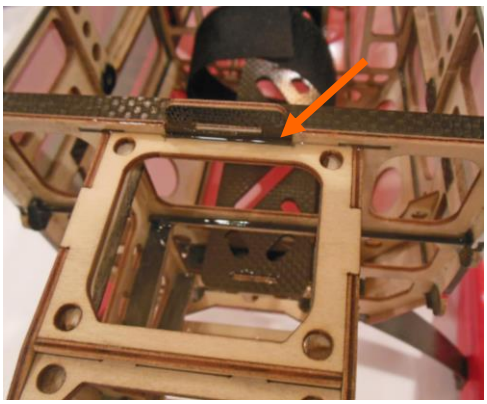
Trim off overhanging fiberglass cloth

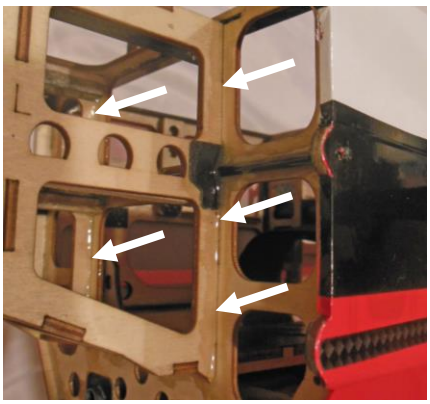
Do not force the motor box into the slots. If it is too tight use a fine file to slightly enlarge the slots until a perfect fit is achieved. If the carbon pins are difficult to insert, use a round needle file to slightly enlarge the holes or taper the pins. The long rod in front of the bulkhead should 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 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 change the pre-set motor thrust angle so take your time to do it right.

9. 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.

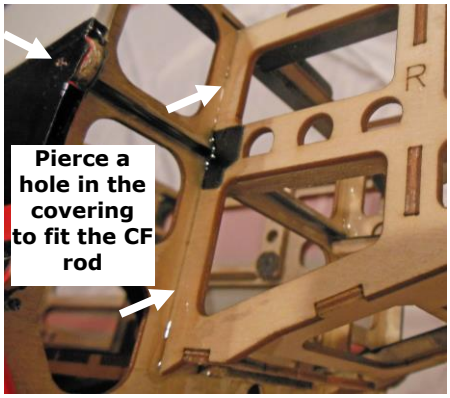


Glue motor box lugs and CF pins

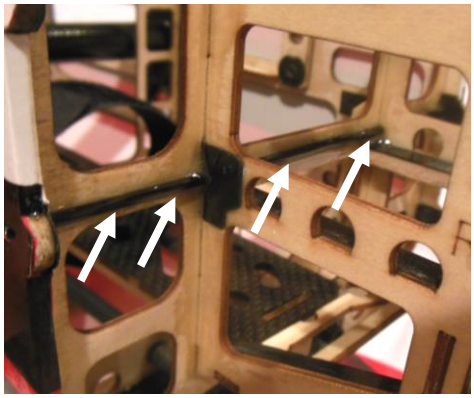




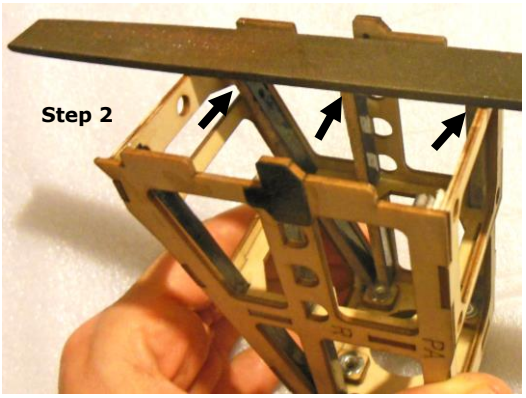
Leave no gap between motorbox and bulkhead



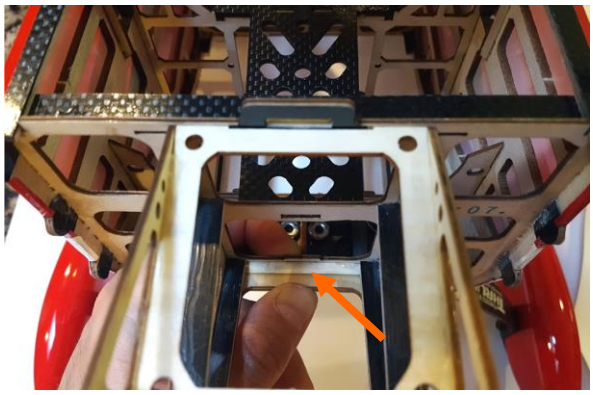
Epoxy ALL seams of the motor box with the bulkhead

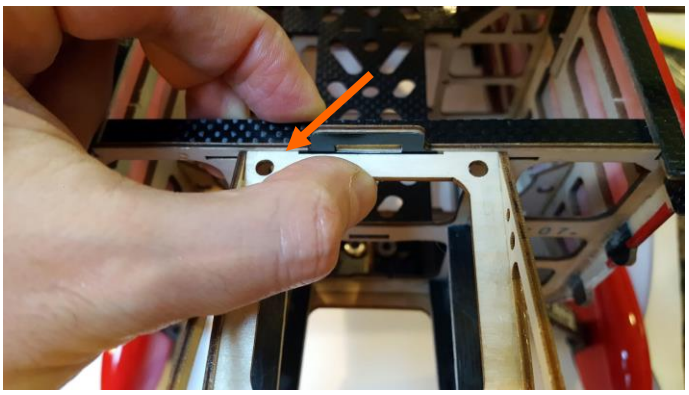


Cover the entire CF rod with epoxy



Verify CF corner stringers do not protrude



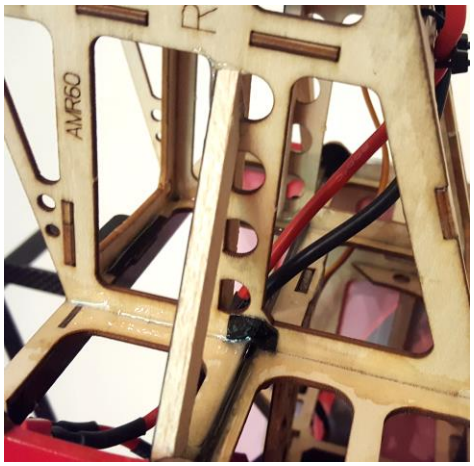


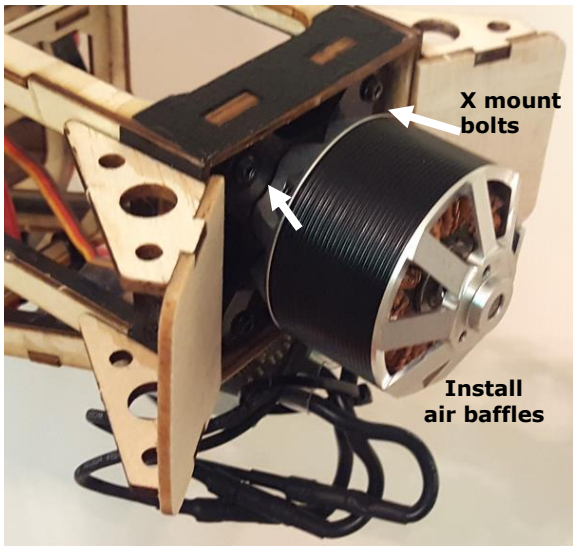
Hold the motorbox firmly with your fingers and apply a drop of CA (top and bottom) before applying epoxy

10. The last step is to install two diagonal CF braces. These braces are installed with the CF facing upwards extending at an angle from the motor box to the edge of the bulkhead. The diagonal braces should be glued on top of the "flattened" lightning holes and above the CF rod on the bulkhead as shown in the photo.

The diagonal brace contacts the bulkhead at an angle, so you should cut/file the brace's end. Temporarily place the brace in place or on top of the motorbox to estimate this angle, mark and gradually file (or cut with a Dremel) and test fit until satisfied.

Test fit the brace in its position, as shown in the photos, and trim the end off if needed. Once satisfied with the length and fit of the brace, apply sufficient amount of epoxy on both gluing joints and glue the brace. If needed, use pins to hold it firmly in place. Install the second CF brace on the opposite side of the motor box in the same manner.





NOTE: Install the motor with the cables positioned downwards.

Motor and ESC Installation

Install the Thrust 60R motor in front of the firewall using the supplied hardware. **DO NOT under any circumstances enlarge/modify the motor box opening or mounting holes of the motor mount**. The motorbox is pre-drilled to accommodate the Thrust 60R 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 AMR60 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 T60R 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.

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 **NOT** 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 AMR60 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.

Apply a bit of Loctite to all the bolts and install the motor onto the motorbox.

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.

Scrape off any epoxy

The AMR60 was designed to be flown on two individual 3 cells battery packs as per the diagram or with one 6S pack. Prepare the ESC for installation by soldering on the cables and Deans connectors for a 6S (6 cells series) circuit configuration (refer to next page diagram). **Tip:** you may choose to add another set of Deans connector in between the ESC and the 6S battery harness if you intend to use a Wattmeter or in-flight data logger).

Warning: Our new Quantum 70 Pro ESC has a selectable SBEC voltage output. **Verify** that it is set to fit your servo brand and specs! If using the NXT90-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 forwards 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). NOTE: 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.

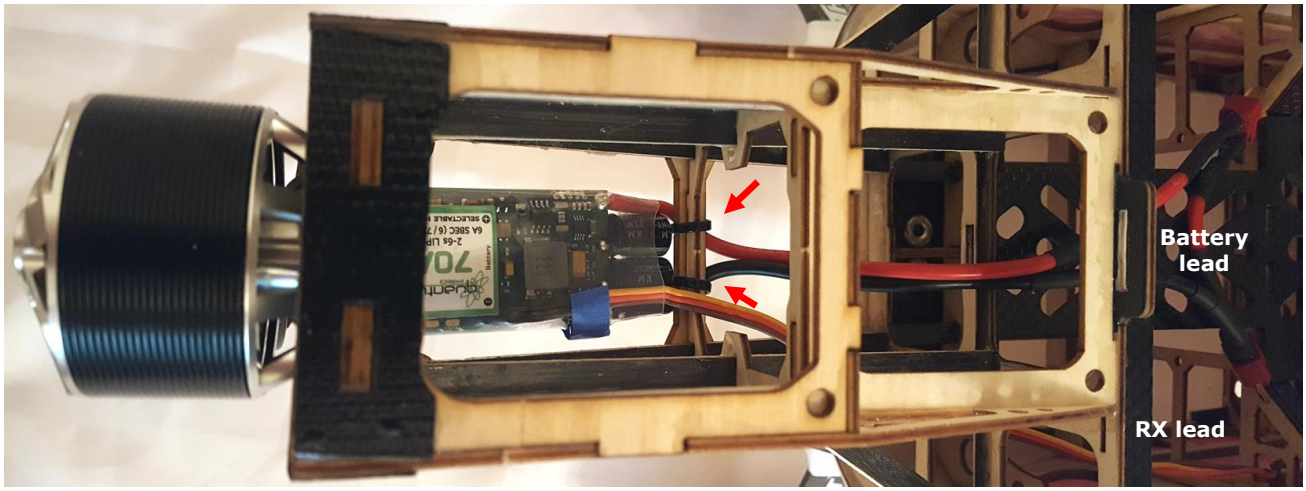
Verify the correct motor rotation direction (should spin clockwise from pilot view). If it doesn't, power down the ESC and swap the positions of any two motor cables or reprogram your Quantum ESC for reversed rotation. We strongly recommend removing the propeller as a safety precaution before powering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

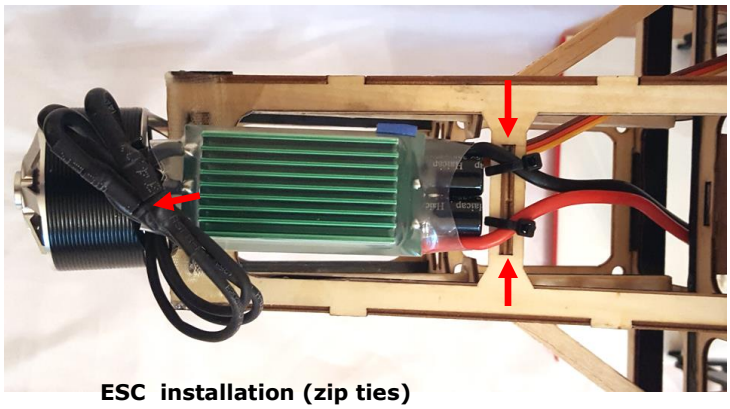
Assemble air baffles

Apply Loctite to the retaining bolt

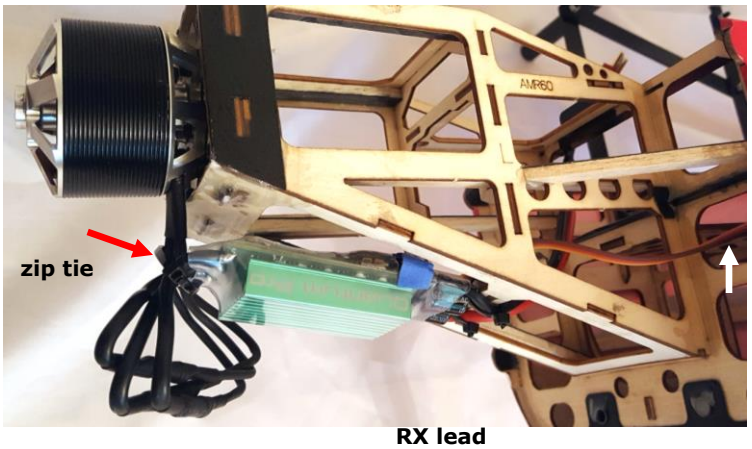
Bolts head must NOT protrude

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)



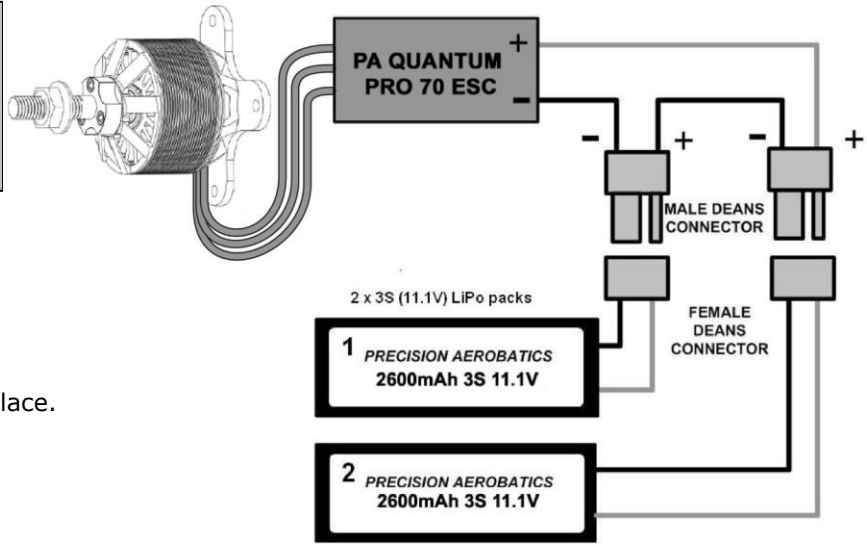
RX lead

6S LiPo harness set up diagram

We strongly suggest to exclusively use US made original DEANS plugs and avoid using cheap copies/alternatives as these had proven to restrict current flow thereby degrading performance.

Note: Use the correct cable size for the harness. Do not use cables that are smaller in gauge to the ones installed on the ESC.

As a precaution you may place a small piece of masking tape over the BEC jumper to secure it in place.



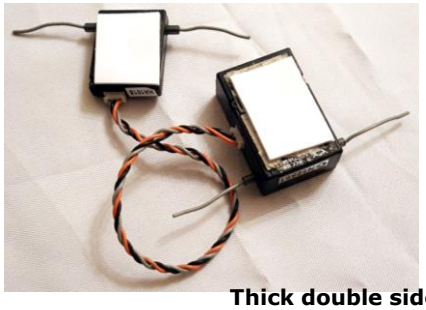
Receiver and battery Placement

Use the installed Velcro or foamed double sided sticky tape to secure the RX on its tray. If you are using a 2.4GHz RX with twin receivers, mount the second RX away from the main RX at the inner side of the fuselage using rubberized or foam double sided sticky tape. Secure RX plugs well to avoid 2.4GHz reboots.
Note: Use only a high quality reliable receiver.

The batteries are held in place on the battery tray using the supplied Velcro straps (there are pre-cut slots in the battery tray to prevent the Velcro from sliding back and forward).To prevent the battery from sliding on the CF tray you can stick a small piece of foamed double sided sticky tape underneath the battery and place a piece of rubber foam on the top of the battery, then wrap and fix it with the Velcro. To avoid the battery from sticking to the CF tray, "weaken" the adhesive by sticking some dust to it. If you are using a single 6s pack, you may place it on its side for easier adjustment due to its thickness/height.

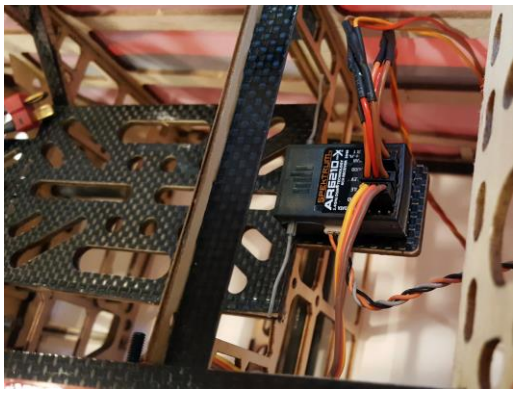
Another two ways to prevent the battery from sliding would be: A. cut two pieces of Velcro (only from the plastic hook type) and stick one underneath the pack and one on the tray itself. Then wrap and strap it down with the Velcro and foam as above. B. wrap a thick rubber band over your battery and continue as the above. You may wish to trim the battery wires to reduce weight.

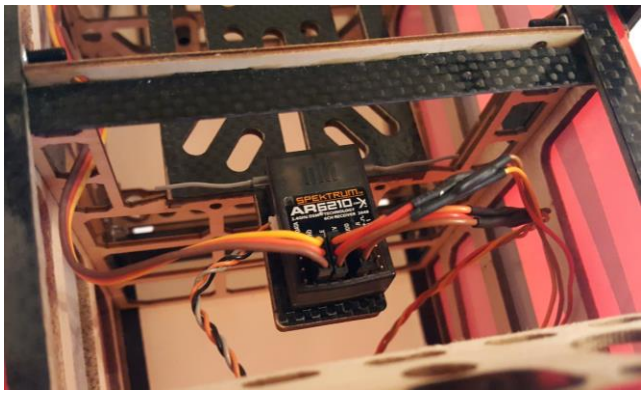
Tip: Once you set up the exact CG per the manual, use a piece of sticky tape or a marker to mark the position of the batteries (rear end) as a reference point when swapping packs between flights.



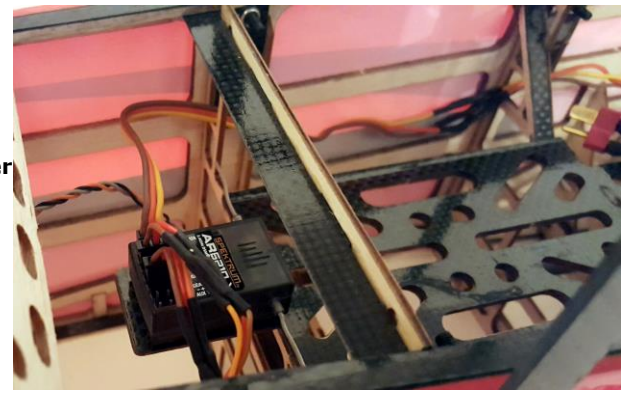
Thick double sided Sticky tape

Batteries can be mounted flat or upright





Spektrum 2.4GHz receiver installation



Cowling and prop adapter

Prior to fitting the cowl it is required to install the prop adapter and have the hatch fitted to the fuselage. Apply Loctite to the bolts and fasten the prop adaptor onto the motor.

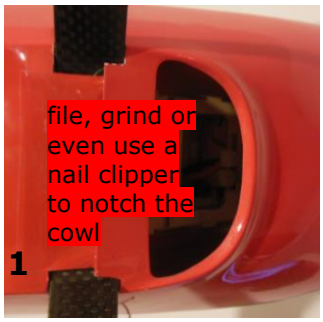
The fiberglass cowl is attached using four self-tapping screws (2.3x10mm with soldered washer) screwed into the carbon fiber mounting lugs. Fit the cowl with a small overlap past the fuselage front bulkhead (over the hatch) and reasonable gap with the spinner's backplate so it won't rub against the cowl front ring. The bottom side of the cowl requires two notches to be filed in to clear the landing gear struts.

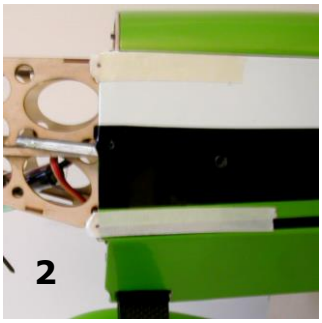
Start by temporarily fitting the cowl in and mark the locations of the landing gear struts where they obstruct the fit. Remove the cowl and carefully file or grind the notches until the struts no longer obstruct the fitting of the cowl.

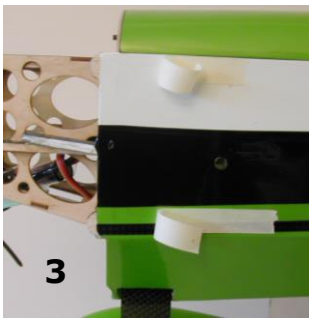
Once cowl is fitted, install the spinner backplate and align it perfectly with the cowl front ring (photo #4). This ensures that the position of the cowl could be adjusted for a precise fit.
Mark the center of the mounting lugs onto pieces of masking tape as shown in photo #2, peel the tape partially back and fit the cowl.

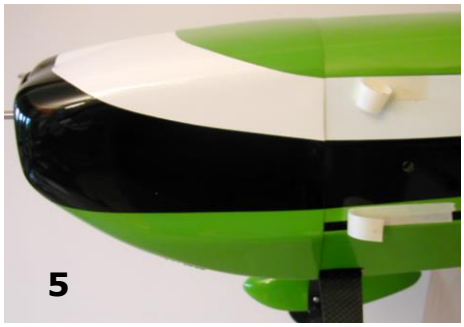
The cowl must be fitted so that when looking from the front, the motor shaft will protrude through the cowl exactly at the center of the opening with a small friction free gap between the spinner backplate and the front of the cowl.
Press down on the top rear section of the cowl to minimize the gap between the hatch and the cowl. Align the painted cowl with the fuselage color scheme on both sides. When you are happy with the fit, hold the cowl firmly in place using tape and lay the pieces of tape you marked previously back onto the cowl. These markings identify the location of the mounting lugs underneath the cowl, allowing you to drill, using a 1.5mm (1/16”) drill bit, through the cowl and into the mounting lugs. After drilling, remove the cowl and screw the four 2.3X10mm self-tapping screws into the drilled holes in the same manner you did with the wheel pants. You may remove the screws and apply a drop of thin CA into each of the holes to set the thread. Once the CA cured reinstall the cowl.

Tip: If the cowling fits too tight, inspect the inner lip of the cowl for any bulging epoxy and sand it down.
It is easier to fit the cowl first with the hatch off, then fit the hatch under the cowl overlap, adjust and continue the procedure of final installation of the cowl.





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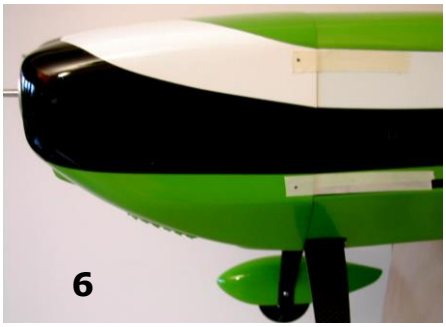
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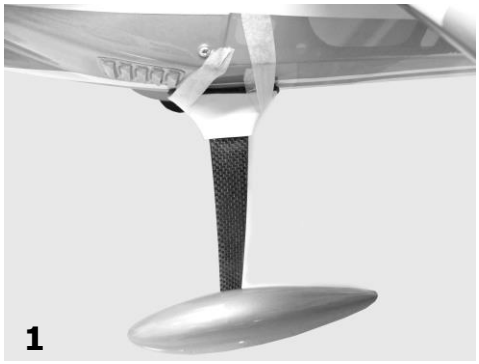
7

Press the cuff against the fuselage minimizing the gap and mark the lower end of the cuff on the LG strut with a small piece of masking tape. Then stick a thick foamed double sided sticky tape from your mark up and press the cuff against it while minimizing any gap between the cuff and fuselage. Do the same with the other cuff.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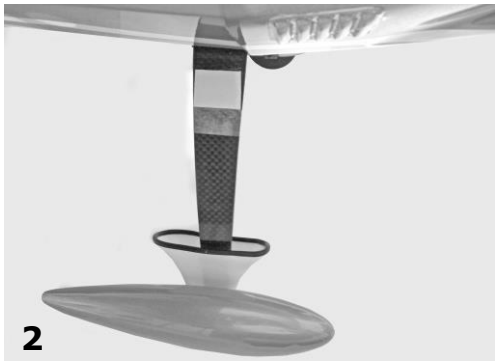
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3

Aileron servo installation

Prior to installing the servos, solder the servo lead extensions (as described with the tail servos). You will require a 200mm/7.9” long extensions (if NXT90-HV is used).

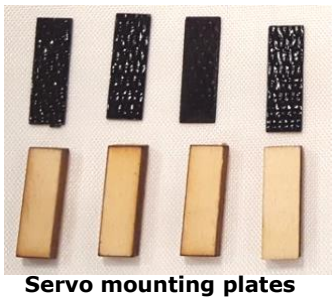
If the wings are to be removed often for transportation you may want to consider using two short extension leads that are permanently plugged to the RX and dangle out of the fuselage. In this case the existing servo leads do not require any modification.

Balsa sheeting may require slight trimming for the servos to fit snugly. Before feeding the servo lead, place the servo upside down in the servo opening and with a sharp blade, make an easy cut around the mounting tabs for the servo to fit. Take the supplied rectangular ply and composite plates and glue them on each side of the tray using CA glue.

Feed the servo cable through the inside of the wing out through the opening in the wing root rib. The easiest method is to feed a zip tie through the wing root and out of the servo bay. Next, stick a string to the end and pull it out. Now, tie the string to the servo plug and pull it out of the wing root slowly and carefully while manipulating the servo plug through.
TIP: Feeding the cable while pulling the string simultaneously is easier.

Insert the aileron servos in the opening you previously cut in the covering film with the servos' output shaft closer to the ailerons as per the photos.
DO NOT force the servos in as you may damage the servo trays. Slightly enlarge the openings if needed, using a sharp blade to "shave off" a bit of ply. Alternatively, you may use a small flat file. Test fit servos during this process and take care not to damage the lead.
NOTE: When fitting the servo into the bay, tilt it so the cable will fit first and place it to the side of the servo so it will not be compressed underneath the servo and against the covering.

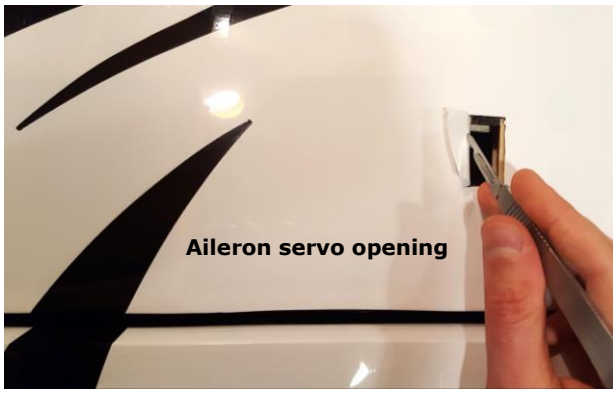
Mark the center of the mounting tab hole to drill.
Using a 1.5mm (1/16”) drill bit, drill and self tap holes as you previously did with the tail servos.


Servo mounting plates

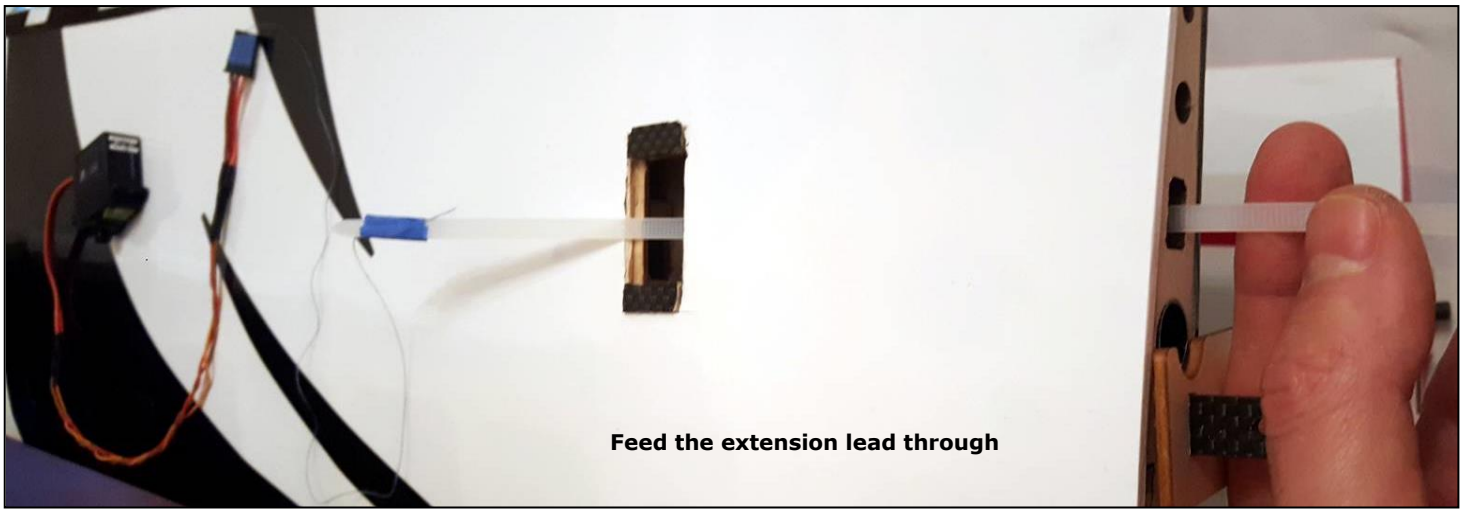
Trim the balsa sheeting for the servo to fit

Trim the balsa sheeting for the servo to fit

PA Lightweight servo extension



Aileron servo opening



Feed the extension lead through

Aileron control linkages

Take the two identical CF pushrods (51mm/2") ,pair control horns and four identical ganging horns from your hardware pack to begin preparing them for installation as per what was previously done for the tail servos.

Next, expose the slots for the aileron control and ganging horns.
The pre-cut slots are located 123mm/4.85" measured from the aileron root outboard (see photo).
look closely to find the pre-cut slots through the white covering and make a few pin holes to verify the spot. Then slit open with a sharp blade or a heated paper clip. Slit open the slots ONLY on the bottom side of the ailerons and not through (just one side).

Follow the exact steps you had previously done for the rudder and elevator control horns to install the aileron and ganging horns. Pay attention to the ball links **correct orientation as shown on the photos.**
At this stage do not install ball links to the ganging horns.

Test fit the CF aileron and ganging control horns. If the fit is too tight do not force the horns in. Instead, use a modeling knife to carefully enlarge the slots until a perfect fit is achieved. Use epoxy to glue the CF horns all the way in and ensure the horns are perfectly 90 degrees perpendicular to the control surfaces.

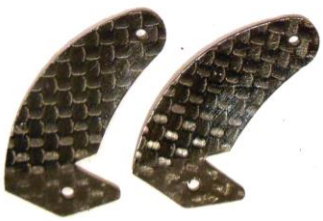
Once the epoxy set, tape the aileron roots in neutral position and proceed to install the ball links to the CF servo arms and CF push rods in the same manner as the rudder and elevator linkages.

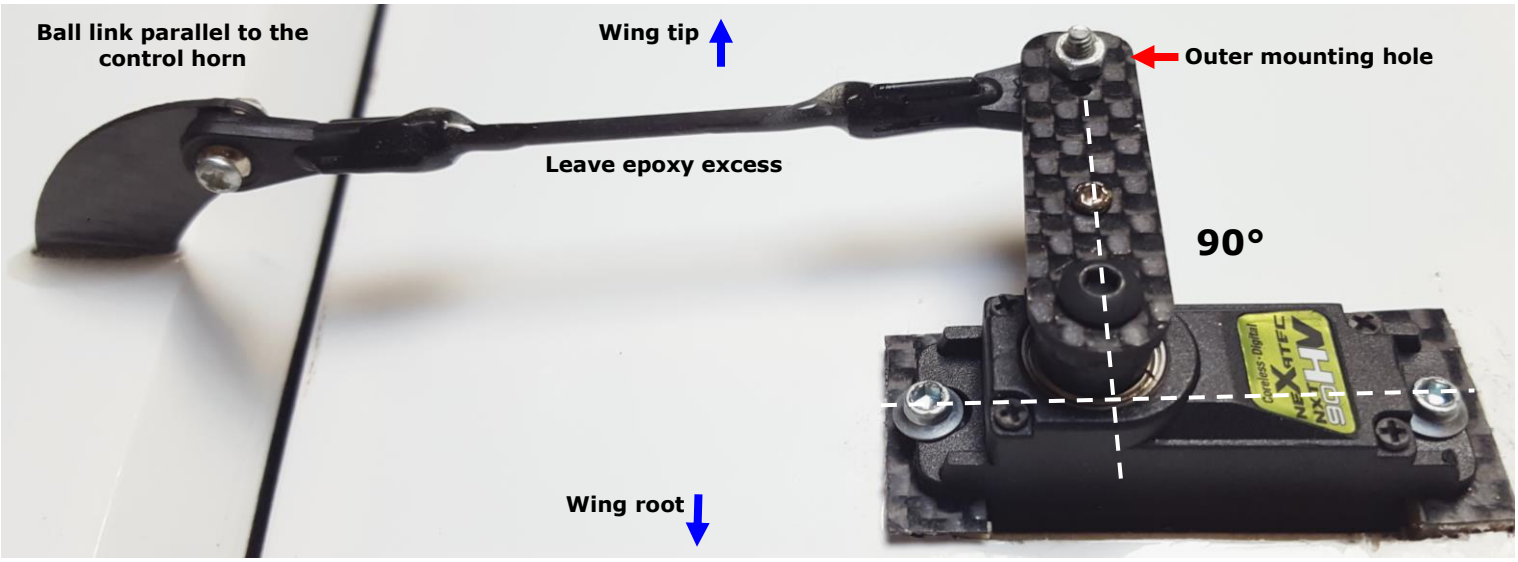
For correct linkage geometry use the PA AMR60 CF servo arms and install the ball links on the **bottom side** of the servo arms and in the **OUTER** mounting holes. The order of assembly is M2x8mm bolt/ball link/CF arm/nut. **Apply Loctite and fasten firmly to secure the nut**


Aileron ganging horns

Make a few pin holes to expose the pre-cut slots


Estimate pushrod length


Aileron control horns



Aileron linkage geometry

Wing struts

The AMR60 wings and cabane are installed with the supplied bolts and nuts. Fuselage and CF wing tabs are pre-glued and drilled to make the assembly as easy as possible with very precise wing incidence.

Please pay attention and follow the **exact** steps and sequence of this manual for the best and safest results.
WARNING: Incorrect assembly or missed steps can lead to a major wing failure during high G maneuvers!! ALL wing bolts and nuts must be firmly tightened with Loctite to secure them in place! It is YOUR responsibility to follow the manual correctly.

Start by test fitting a wing bolt into ALL twelve CF mounting tabs before you begin assembly.
We keep a tight production tolerance, therefore drill them slightly undersized to ensure a slop-free fit.
If the bolt doesn't fit, use a fine needle file carefully to **slightly** enlarge the hole to get a precise fit. Test fit the mounting bolt a few times during the process. **Take your time** to do so because an oversized hole would cause undesired slop/play.

As a precaution, pull on each CF tabs to verify that the glue bond is sound. If you find a loose tab please contact us for technical assistance.

Place the bottom wing panels on the bench and install the wing struts onto the bottom wing using the supplied black anodized M3x8mm button head cap screws, washers and nuts. Refer to the photo below to note the orientation of the wing struts before you install. The order of assembly is bolt, washer, wing strut & nut. NOTE: Washers are used only with the wing struts. **Apply Loctite and fasten firmly to secure the nuts. Press the struts down on the final fastening as to minimize the gap with the wing surface.**

Minimize any gap with the wing

Washers on the outside

Wing cabane

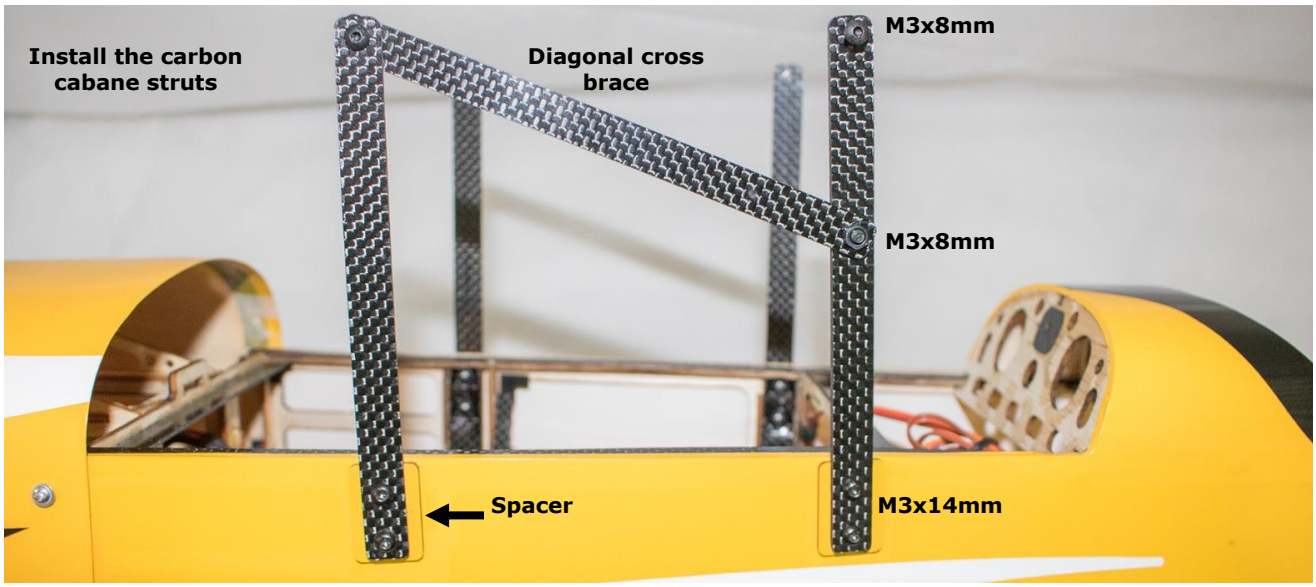
Start by test fitting a mounting bolt into ALL of the CF cabane braces exactly as you did with the mounting tabs earlier.

Install the four **vertical** Carbon Fiber cabane braces onto the fuselage as shown in the photos. To install, use the supplied, longer black anodized M3x14mm button head cap screws, colored spacers and nuts. Note that the longer vertical braces (with the additional hole in the middle) are to be installed at the rear position of the fuselage mount. The order of assembly is bolt, vertical brace, colored spacer & nut. **Apply Loctite and fasten firmly to secure the nuts.**

Fuselage pre-drilled holes are also slightly undersized to ensure precise alignment. If the bolts do not fit, use a small round file to **slightly** clear the holes just for the bolts to fit with minimum slop/play.

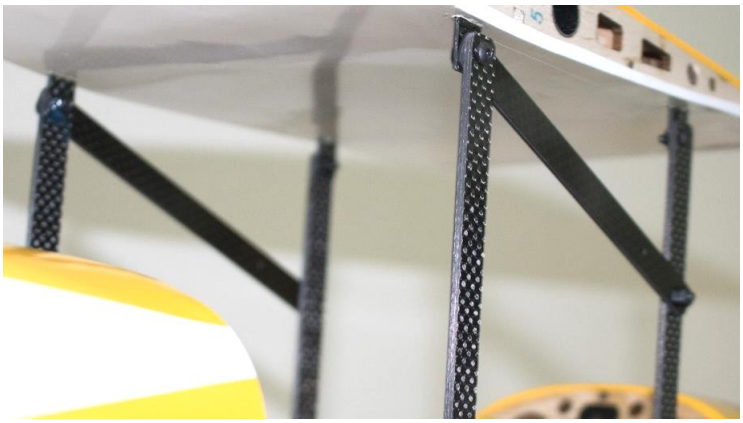
Install the CF diagonal braces, **as shown in the photo**, using the supplied, shorter black anodized M3x8mm button head cap screws & nuts. The diagonal brace rear bolt is the ONLY bolt to be installed from the inside out. That will ease the removal of the hatch. Refer to photos on the correct position of the diagonal braces over the verticals ones.

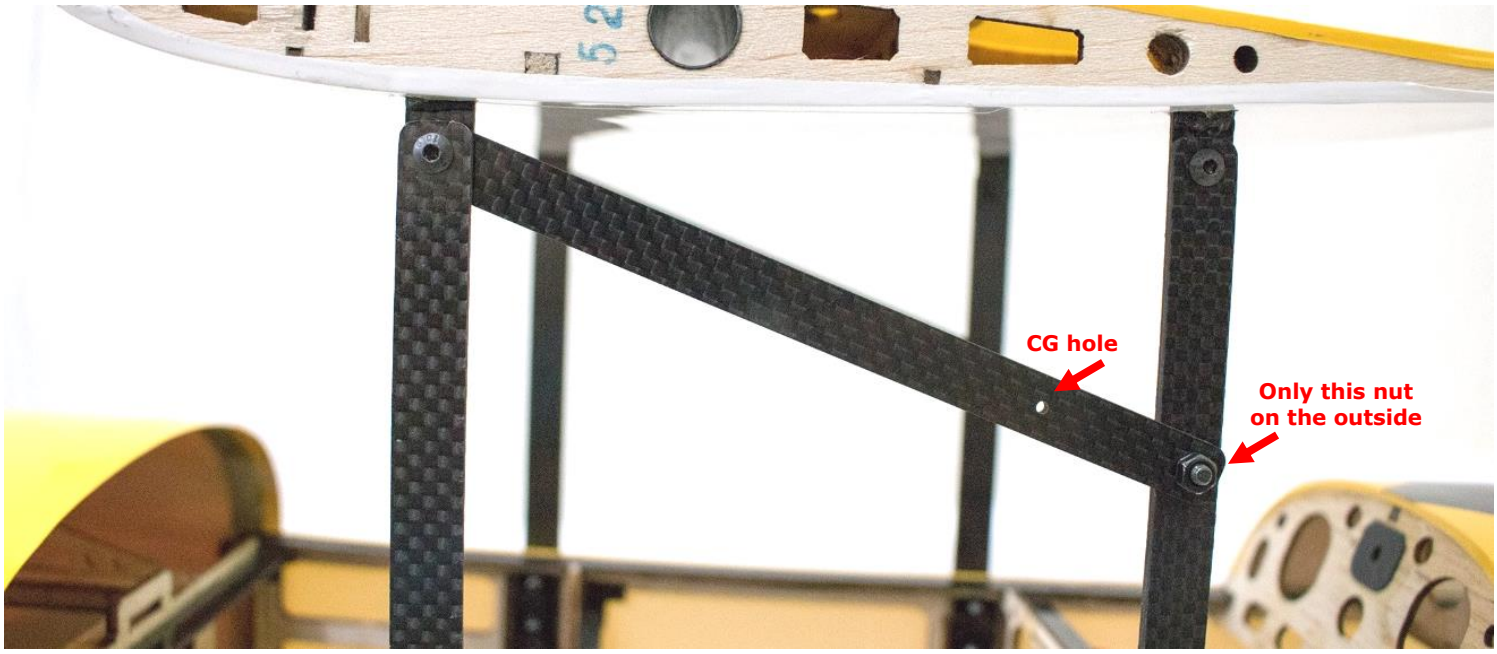
NOTE: The diagonal braces have an additional small hole to set the CG on a later stage. Make sure to install the braces with this hole positioned towards the rear of the fuselage mount.



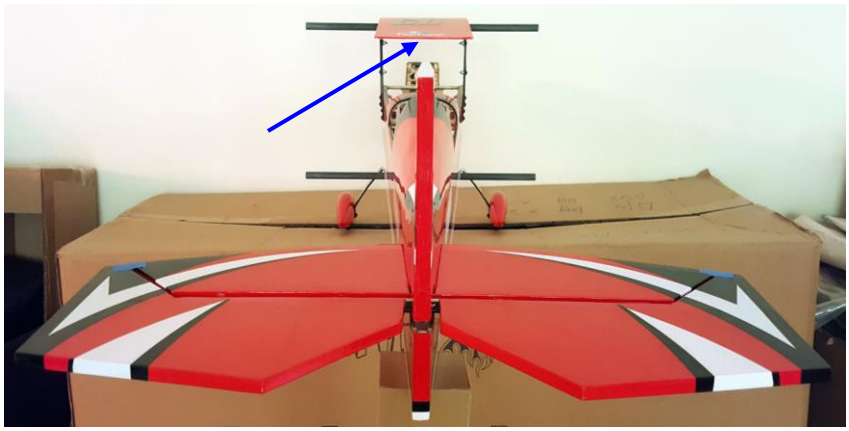
Install the wing cabane onto the four **vertical** CF cabane braces as shown in the photo. To install, use the supplied, black anodized M3x8mm button head cap screws and nuts. Note that both front and rear CF mounting tabs should be installed on the inside of the vertical CF braces (see photos).
It is important to install the wing cabane in this manner to ensure the correct wing incidence is retained. Verify your wing mounting against the photos. **Apply Loctite and fasten firmly to secure the nuts.**
NOTE: When installing the cabanas, place your hand on top during the final fastening to get a precise fit, especially in case the mounting holes are slightly oversize. You may place a heavy item such as a book on top during the final fastening of the nuts.

Press down while fastening the bolts





With the wing cabane installed onto the fuselage, inspect the cabane trailing edge from rear of the model. Use the stabilizer as a reference point (temporarily use masking tape to fix the elevator in neutral). The trailing edge should be parallel to the stabilizer. We check and correct it in the factory after the covering process, however, there is a chance that during the long journey in a container across countries, that a small warp develops at the trailing edge due to climate differences. In this case, counter twist the trailing edge and with an iron set at low temperature, shrink the wrinkles that will appear in the covering while twisting. When satisfied, continue to the next step.



Inspect the cabane's Trailing Edge

Lift the tail up to inspect

Bottom Wing Attachment

Test fit both Carbon Fiber wing tubes into the fuselage and cabane. Both tubes are identical.
Note: Due to the manufacturing tolerance of the CF wing tube and sleeves, you may experience a tight fit with difficulty sliding the wing onto the wing tube. Tight fit may create a bit of a gap between the wing root and the fuselage. In a case of a tight fit slightly sand the CF wing tube with fine sandpaper, wipe off the carbon dust using a wet paper towel and test fit again. Repeat this process until you obtain a perfect fit.
Do not attempt to force the wings onto the wing tube as this may cause damage.

As a precaution, pull on each CF tabs and anti rotation pins to verify that the glue bond is sound as damage may occur during shipping. If you find a loose tab or pin please contact us for technical assistance. We recommend applying a few drops of thin CA into each tab and pin for safety.

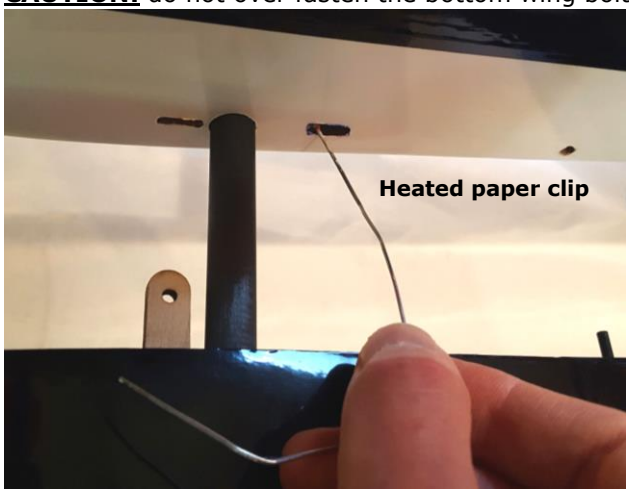
The wings must initially be installed in this sequence: First insert the CF wing tube all the way into the sleeve of one wing panel until it reaches the stopper. Next fit the wing to the fuselage, taking care to align the CF anti-rotation pins when about to insert them into the fuselage. If resistance is felt, do not attempt to force the pins in. Instead, remove the wing and lightly file the tips of the anti-rotation pins (taper them). Avoid enlarging the receptacle holes in the fuselage as loose fit may result in incorrect wing incidence.

Due to the large size of the wing roots you may need to wobble the wing panel, in order to fit the anti rotation pin and mounting tab into the fuselage. If after you fit one wing panel the anti rotation pin of the other panel would not align easily, remove the wing panel and install the other wing panel first.

In order to fit the aileron servo leads into the fuselage, small openings are required to be cut open in the covering. These openings should be slightly larger than the lead plugs and should be next to the fuselage wing sleeve. Slide the wing panels onto the wing tube close to the fuselage to estimate the location of where to cut. Mark the spots and cut with a sharp blade or a heated paper clip as you did with the servo openings. Feed the leads into the fuselage and slide the wing panels tight to the fuselage.

Next, install the other wing panel onto the CF wing tube. If there is a gap between the wing and the fuselage, remove the wing and slightly sand short one end of the CF tube then refit the wing. Do not attempt to force the wing onto the wing tube. **Note**: If the wing panels have a tight fit over the wing tube then chances are high for a gap between the wing roots and the fuselage. If so lightly sand down the wing tube to allow an easy fit which will correct it.

To secure the bottom wing in place before flight, use the supplied silver M3x18mm button head cap screws. During the assembling of the model, the wing bolts are not required to be fastened. NOTE: Do NOT use Loctite on these bolts so the wing can be easily removed.
CAUTION: do not over fasten the bottom wing bolts as it may crush the mounting tabs and can lead to a failure.



Bottom wing mounting bolts

Top Wing Attachment

Minimize any gap with the wing

Washers on the outside

Fit the top wing panels in the same manner as with the bottom wing. CF mounting tabs should be installed on the outside of the wing struts. Once satisfied with the fit, bolt on the wing struts to the top wing mounting tabs using the supplied black anodized M3x8mm button head cap screws, washers and nuts.
The order of assembly is bolt, washer, wing strut & nut. **Apply Loctite and fasten firmly to secure the nuts. Press the top wing down on the final fastening to minimize the gap with the wing surface.**

To secure the top wing in place before flight, use the supplied 2"(51mm) CF retaining rods.
Again, the CF tabs are drilled slightly undersized to ensure a slop-free fit.
If the pins fit is too tight, slightly taper their tips with a fine file and slightly sand down a 1/2"(12mm) of the front end.

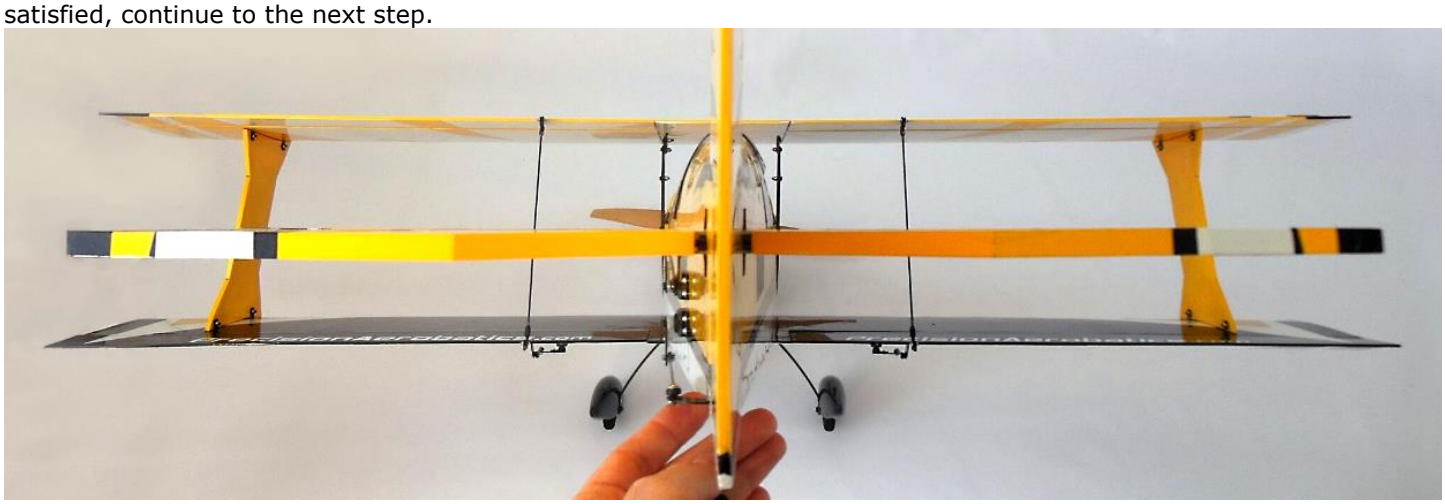
CAUTION: Retaining CF rods MUST be fitted **all the way into and over the CF tabs!** To verify the wings are secured, pins should protrude the cabane leading edge no more than 5/16"(8mm). Once fitted, try to pull the wing off. If the CF pins are installed correctly, you would not be able to take them off. **Do NOT** over fasten the bottom wing bolts as it may crush the mounting tabs and can lead to a failure.

NOTE: The easiest way to remove the hatch is from the front of the plane. Open the latch, pull it slightly away from the cowl, tilt it and pull it out.

Ailerons twist check

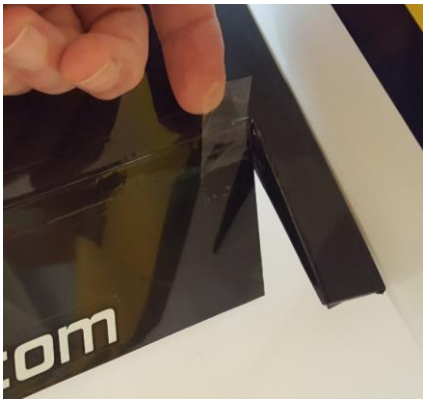
With the wings installed onto the fuselage, tape the ailerons in the neutral position at the wing root.
Stand behind the model, lift the plane's tail and look down the length of **each of the ailerons at a time** to ensure they are perfectly straight/parallel to the stabilizer (tape the elevator in neutral as well). The ailerons should be neutral at the wing tip as they are at the wing root (see photos).

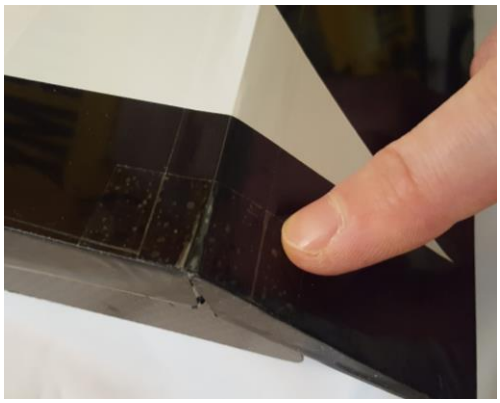
The wings and ailerons are built using extremely accurate jigs to ensure precise alignment. Incidence is set within our strict tolerances twice during the production and re-checked and corrected in the factory after the covering process, however, like the cabane, there is a chance that a small warp may have developed at the trailing edges due to climate differences and the lightweight of the control surfaces. In this case, counter twist the trailing edges and with an iron set at low temperature, shrink the wrinkles that will appear in the covering while twisting. Do it gradually and in two spots, middle of the aileron and then tip. Inspect it during the process until you get a perfect alignment with the stabilizer. When satisfied, continue to the next step.



Inspect each aileron at a time

Piece of clear tape over the aileron root





Piece of clear tape over the aileron tip

Ailerons are pre-hinged from both sides. Top film hinge strip may peel off over time and especially during hot summer days. As a precaution I strongly recommend to apply small pieces of clear tape. Three on the bottom wing ailerons (tip, center and root), two on the top wing ailerons (tip and root). IF over time the top film adhesive starts to give, you may replace it with a long clear tape instead. **NOTE:** Aileron should be fully deflected downwards when applying the tape.

Ganging pushrods

With the ailerons taped in neutral and aileron servos in neutral you can complete the installation of the ganging pushrods.

Supplied with the hardware pack is a small separate plastic bag labeled "ganging pushrods". In this bag you will find the two German made ball links and metal couplers specifically designated for the ganging linkages. Hold the metal coupler with pliers and thread on one of the ball links **all the way in**. Now, back off approximately 5-6 turns as to leave some refining adjustment of the final pushrod length. Do the same with the other set. Install each of these ball links to the ganging horns of the **bottom wing**. Install them in the correct side of horn as shown in the photo.
Attention: At this stage, lightly fasten the nuts and do NOT apply Loctite. That will be done during the TX setup.

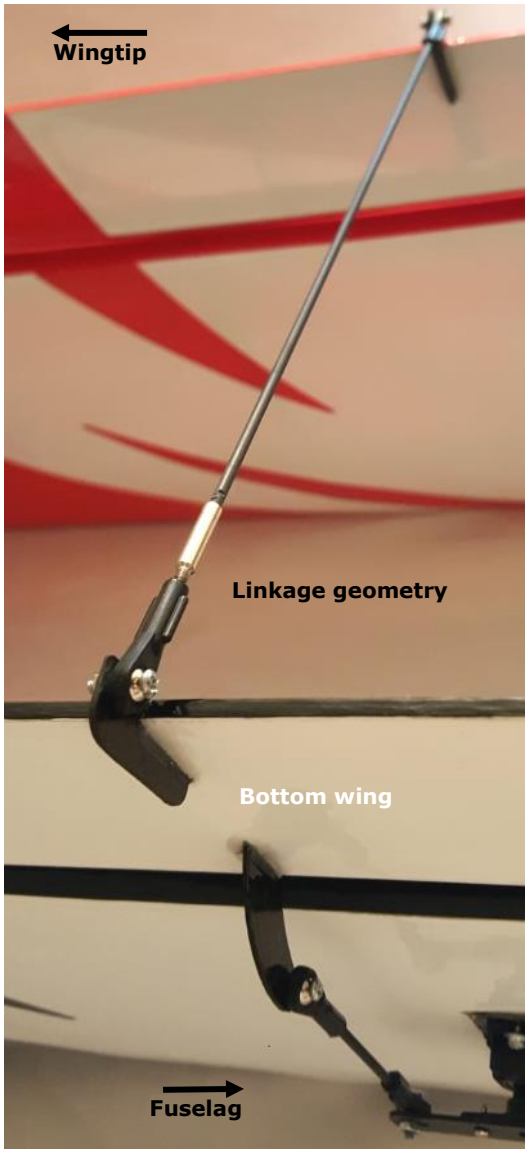
Use the M2x8mm bolts and nuts to install two ball links to the **top wing** ganging horns in the **correct orientation** as shown on the photos. The order of assembly is M2x8mm bolt/ball link/CF horn/nut. **Apply Loctite and fasten firmly to secure the nut.**

Take the two identical, longest, CF pushrods (213mm/8.4") from your hardware pack to begin preparing them for installation as per what was previously done for the tail servos.
Follow the **exact steps** you had previously done for the rudder and elevator pushrods to install the aileron ganging pushrods.

Before the epoxy sets, verify pushrods to be fully inserted into the ball links and metal couplers, all ailerons are in neutral position, then adjust ball links to be **parallel** to the control horns. This step is important and will prevent any linkage binding.

Aileron and ganging CF control horns (Bottom wing)

Ganging CF control horn (Top wing)



Note the orientation of the ball link

Ganging CF control horn (Bottom wing)

Transmitter Setup

As precaution, remove **all servo arms and propeller prior to initially powering up your radio system.** This prevents servos that may be initially reversed or off center to rotate beyond the control surface's deflection angles and motor to accidentally start up. Once powered up reset servos to neutral and reinstall the servo arms. Move TX sticks to verify that the control surfaces are moving in the intended directions and if not reverse rotation via the TX.

With all the channels verified, adjust the sub-trim to obtain the neutral position for all control surfaces. If you have followed the control linkage set up in the earlier sections, the sub-trims will be very minimal. Adjust the servos travel to ensure none of the servos are over traveling causing binding in the linkages.
Note that binding linkages will overload the servos which will overheat the BEC and risk a possible shutdown.

Control Setup

Assemble the supplied deflection meter using the M2x8mm bolt and nut. Note that each graduation of the meter indicates an increment of 5 degrees. You may mark the 45 degrees graduation for easier orientation. Using the supplied deflection meter, we suggest setting up your control surfaces deflection in accordance with the following table. Use these as a starting point and adjust them to suit your personal flying preferences.

Start by adjusting the final length of the ganging pushrods to yield a precise neutral position for each set of ailerons. Once satisfied, **apply Loctite and fasten firmly to secure the nut.** Make sure there is enough thread of the ball link onto the metal coupler to prevent in-flight failure.

Adjust ball links to be **parallel** to the control horns. This step is important and will prevent any linkage binding.

All the figures in this table are approximated		
Control surface	**High rates**	**Low rates**
Ailerons	Approx 45° Up and Down Expo: 60%	15° Up and Down Expo: 30%
Rudder	Left and Right (maximum) Expo: 60%	25° Left and Right Expo: 35%
Elevator	approx 60° Up and Down Expo: 60%	15° Up and Down Expo: 35%

Optional Spoilerons: Set 10°-12° of UP and Down ailerons deflection on a 3 position switch such as F. Mode switch. The center position of the switch is where the ailerons are neutral/0°. Upward deflection of the ailerons, in accordance to the plane's position, (i.e. Spoilerons) will allow faster descending "Elevators", spins and slower high AOA harriers. Spoilerons were great for elevators and harriers since they allowed higher propeller rpm which kept the plane more flat (during the elevator) and made high AOA harriers slower and more stable.

Flight Trimming

On takeoffs The Ultimate AMR will be airborne after a very short run, therefore, let it gain some air speed to allow airflow over the wings before trimming. After a few seconds of straight and level flight, on **¾ throttle**, it will balance itself and then you may adjust the TX trims. You will require elevator "down" trim to get a level flight. This is normal due to the aerodynamic drag generated by the upper wing, however, CG is a critical factor, therefore, make sure to set it up **exactly** as stated on this manual, otherwise the plane will not fly true. BE AWARE that during the consecutive flights after you trimmed the model the plane will tend to slightly dive immediately after the takeoff, this is normal due to the "down trim" so don't re-trim it afterwards. Just let the plane fly straight and level for a few seconds after take off and it will balance again (it is the upper wing aerodynamic drag effect at low and high speeds).
Please note that the AMR60 is a very precise plane and will keep its heading wherever you point its nose. In this regard it behaves a little different to monoplanes that you may be use to, therefore you should avoid re-trimming during each flight. Trim the plane at ¾ of throttle and not full power.

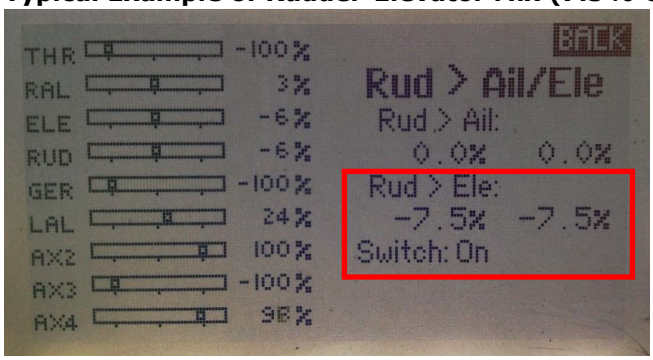
Control Mix

The AMR60 exhibits no KE coupling, however, due to the "down" trim, set previously, it requires a low percentage of rudder/elevator mix that will neutralize the elevator ("down" trim) ONLY during KE flight.
Without the mix input, the model will tuck towards the belly due to the slight "down" trim required for level flight (read "Flight Trimming" section above).

In order to understand the degree of mixing required, please refer to the photos below intended to serve as an example programmed into a Spektrum 9X transmitter. The display on your transmitter may differ from the example shown below. As such please refer to your transmitter's instruction manual in order to access the programming mode and to program the required mix in. In principal, the mix requires a little **"UP" elevator** to work in conjunction with the rudder input.

Mixing values may possibly vary from different transmitter brands; however, the mix percentage should be quite close if you **set the CG correctly**. As such, it is recommended to initially input tiny amounts of mixing and subsequently change the mixing values in small increments in order to avoid over mixing at the start.

Typical Example of Rudder-Elevator Mix (7.5% UP elevator)



Initial Flight timer settings

Unlike older lithium polymer (LiPo) packs where a drop in performance is usually noticed during the last quarter of the flight warning the modeller to land, PA's newer high discharge lithium polymer packs have the ability to sustain a higher and constant voltage which results in consistent performance throughout the flight until LVC (**L**ow **V**oltage **C**utoff) is activated. As such there may be instances that a modeller may accidentally prolong the landing and experience an unwanted LVC or in the long term, encounter battery damage due to over discharging, therefore, we recommend setting the flight timer as a matter of good practice. Flying style affects current consumption so flight duration may vary from one modeller to another. We suggest to initially set your flight timer at a very conservative setting. Then gradually adjust the flight duration after analyzing the battery capacity consumption over the next few consecutive flights. The mAh consumption can be observed via your fast digital charger or battery checker.

If using our recommended iPAs® setup you may start by setting up your TX timer to 5:00 minutes and adjust it as explained above. Typically you can expect anywhere between 6-7minutes of flight duration. Re-adjust the timer whenever you change the propeller to a different size (refer to the recommended propellers).

Pilot Figure (Optional)

PA pilot (item # AC-2148)

To install the pilot, apply decals if you wish to, then take the supplied balsa cross and sand its ends to a perfect fit. Apply a few drops of CA to glue it in place, then test fit the pilot in the hatch. Place it over the hatch base and once satisfied with the position, apply a few drops of CA to secure it in place. Verify the integrity of the glue as the canopy will be installed permanently.

Canopy

The AMR60 canopy will be glued onto the fuselage with epoxy. You will need epoxy, denatured alcohol (methylated spirits) and a paper towel.

Dry fit the canopy onto the fuselage to get an idea on the final position.
Before gluing the canopy, I recommend to lightly dampen a paper towel with methylated spirits and clean the complete inside of the canopy to get a good shine. Next, mix a little bit of epoxy and apply a thin layer on the inside of the canopy along the black trim.

Carefully place the canopy onto the fuselage as close as possible to the final position. Inspect it from all angles and do the final adjustments. Once satisfied, apply long strips of masking tape to hold it down firmly to minimize any gap with the fuselage. If you still find a gap, especially at the front of the canopy, you can fill it with epoxy using a tooth pick. Before letting the epoxy to set, use a paper towel or cotton swab soaked in denatured alcohol (methylated spirits) to wipe off epoxy excess.

Wipe off epoxy excess

Apply a thin layer of epoxy

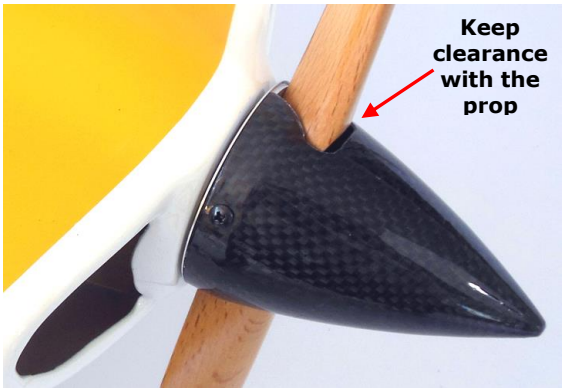
Hold canopy down with masking tape

Propeller and Spinner installation

At this stage mount the propeller and if you are using a spinner, mount the cone as well. We recommend using the pre-cut 2.17" lightweight PA Carbon Fiber spinner (PA code # AC-2219) that perfectly matches the AMR60 cowl shape, to retain optimum CG and avoid carrying unnecessary weight. It's recommended to use temporary Loctite on the propeller adaptor mounting bolts.

Note: While fastening the propeller nut, hold the prop and spinner backplate firmly by hand to prevent it from slipping. Don't use tools as you might deform it.
Caution-Wood propellers require that the nut be retightened after the first few flights.
Failing to do so may result in loss of propeller during flight.

Note: It is important to accurately balance your propeller prior to installation as poorly balanced propellers are inefficient and cause vibrations which are detrimental to your model and motor. Use only propellers that are adequately sized to be within the specified limits of your motor.



If your Vox prop fits tight (we keep a tight tolerance for accuracy) use a fine round file (smaller diameter than the hub center hole) to very slightly file it all around and test fit it. It should fit snug.

APC propellers are not recommended for the AMR60 due to the higher amps drawn and vibration which can lead to a motorbox failure or damage to your gear.

If your CF spinner cone wobbles while spinning, it is more likely that the cone is not sitting flush with the backplate. There are a few potential causes for this:

1. The mounting bolts compromise the flush fit. In this case, use a fine rounded file to slightly file the holes in an oval shape towards the front of the cone. Filing towards the rear will weaken the cone.
2. The prop blade openings are undersized and make contact with the propeller. Enlarge the openings with a file to allow an even gap around the propeller. **Caution:** Thrust 60R is extremely powerful, therefore larger clearance is required between the cone and the propeller blades which will be under high flight loads. Failing to do so will result in a cone popping off during flight.
3. Bulging epoxy on the inner lip which should be sanded down

If the above were done and the cone still wobbles, unfasten the bolts and rotate the cone 180 degrees and re-fasten it. for a fine adjustment you may unfasten one bolt, counter adjust the cone and re-fasten.
NOTE: Use washers and fasten the mounting bolts firmly with Loctite.

Center of Gravity (CG)

The AMR60 was designed with a very narrow CG range to attain the best flying performance. Using the iPAs® setup we have listed, you should end up with a center of gravity very close to the ideal position. Fine adjustments should be made by sliding the batteries fore or aft on the battery tray. It is **very important**, regardless of chosen setup, to check your model's center of gravity (on the bench) as accurately as possible as any small deviation will dramatically affect the flight performance. Setting the CG precisely is one of the crucial points to have a good flying plane. Take your time to set it right.
NOTE: While setting up the CG, The plane should be placed upright with **ALL** the gear installed including wheel pants, hatch, prop and spinner.

Bi-planes require special CG rigs in order to set the CG. To make it easier for you I designed the diagonal cabane strut with a small hole exactly at the CG "sweet spot". Slightly pull out top wing panels (about 8mm, 5/16") then feed a fishing line through the two holes and over the cabane. You can then tie a loop at each end and hang the model up on a hook. Now, hold a micro spirit level above the stabilizer while supporting the tail from underneath with your hand. Do not rest the spirit level on the stabilizer, use it only as a guide. Slowly move away your hand and look closely at the tail.
If it drops/lifts it means the tail was not leveled. Adjust the battery position on the tray until the tail remains still when you take your hand away.

The AMR60 is an excellent high speed precision aerobatics and 3D performer; therefore, in order to achieve the best of both worlds we spent many hours testing the CG to find the "sweet spot" that offers a peak in overall performance. We found the "sweet spot" CG with the optional Vortex Generators installed to be the fine line which allows a good blend of both precision and 3D. With this CG the plane is neutral and axial with no KE coupling.
If you find the plane too neutral for you or it's a windy day, you may choose to set it slightly forward as it offers a better wind penetration in windier condition and will feel like it "flies on rails". Once you get used to the plane try the "sweet spot" to get better overall performance.

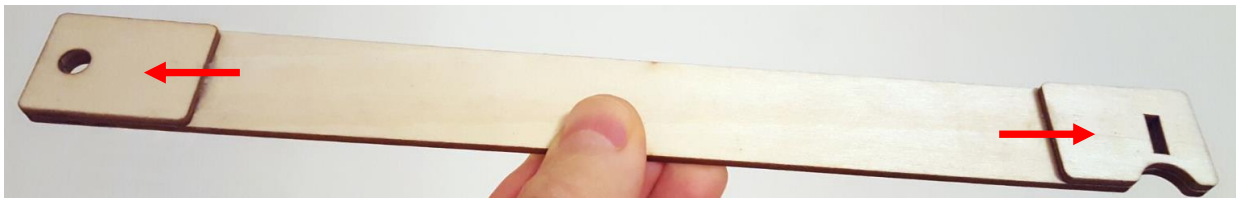
Fishing line over the cabane


Fishing line through the diagonal cabane strut

Wings Carry Jigs

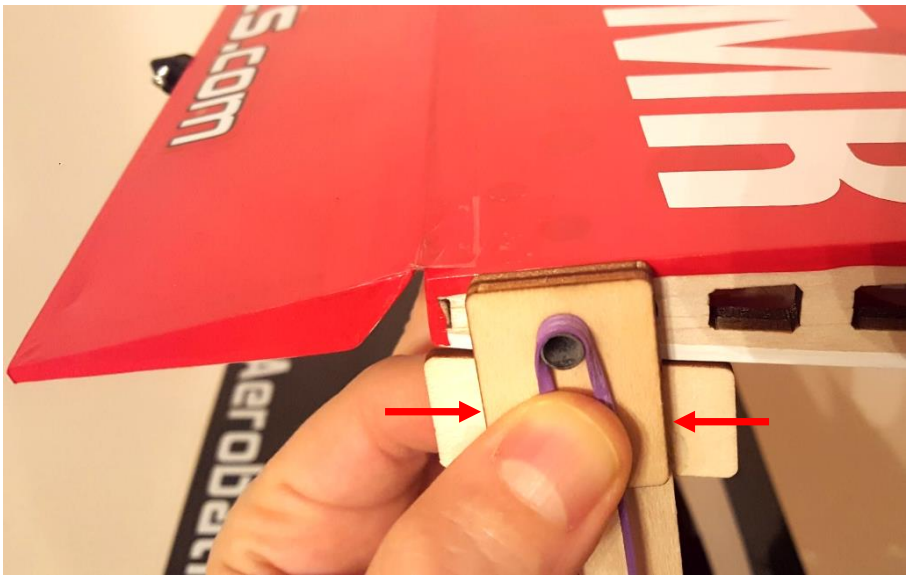
To ease the installation or transportation of the AMR60, I designed a set of carry jigs. Each jig supports a set of wings (wing struts remain installed). The jig is installed and removed while the wings are still attached to the fuselage (wing tubes). Slightly slide each set of wings away from the fuselage to install or remove the jigs.

To assemble the wing carrying jigs, please follow the following three steps:
1. Glue the two ply doublers with CA (one on each end accordingly).
2. Install the jig on one wing set and tie the two anti rotation pins with the rudder band.
3. Hold the third ply doubler firmly against airfoil as shown and apply a drop of CA on each side to fix it in place.



Glue the ply doublers with CA

Wing carry jig



Hold the ply doubler tight with the airfoil and apply CA

Wing bags

Maiden Flight

THE Maiden flight! It is vital that you choose a proper day for the maiden flight. The combination being nervous flying a new plane along with the fact you are not familiar with the plane can lead to mishaps. Choose a good calm non-gusty day (about 0-8 MPH/knots wind). It may be early morning or late evening.

It is vital to run some good bench tests (outdoor) pointing the propeller away from you or anybody around and blip the throttle from min to max power a few times. This is a harsh test that will apply a lot of load but will verify the prop adaptor is firmly installed (otherwise it may fly off), gear is working properly and the propeller is balanced (no vibrations!!).

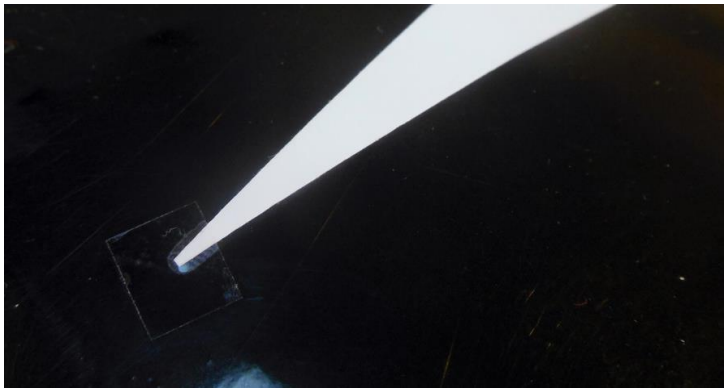
NOTE: **ALL** new gear **must** be tested on the bench/ground before take off with no exceptions. Check servos and linkages for proper movement at the same time.

Applying the Decals

Small wrinkles in the covering can be removed with a hobby iron set at low temperature, however, extreme care must be taken, as it is possible to introduce warp to an otherwise straight part while removing wrinkles therefore I suggest to avoid it. Do NOT use a heat gun as it will cause warp and may damage the thin covering trims.

As a final touch, decorate your AMR60 using the supplied PA decals. You may use the following photos as a guide.

Apply the supplied decal strips on both sides of the cowling and hatch to match the fuselage trim. use a sharp blade to cut them at the cowl seam.



Thin edges of covering trim tend to peel off over time. I strongly suggest to apply small pieces of clear tape over these sharp edges to secure them it place. Do the same with the hatch front sticker trim.

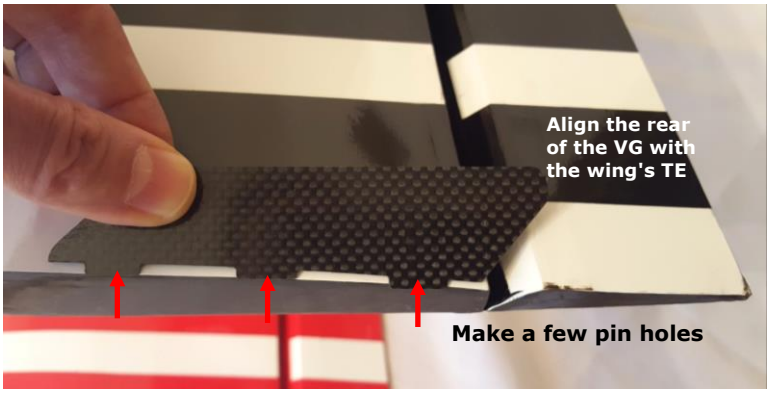
Carbon Fiber Vortex Generators installation

If you purchased the optional CF Vortex Generators (PA Item code # AC-2319) designed for the AMR60, you can install them now. The CNC machined CF Vortex Generators will enhance your AMR60 flight characteristics in slow high AOA flight, 3D and Knife Edge tracking and will add the funky look to your plane. We highly recommend them to complete the aerodynamic design of the AMR60 in order the get the best performance. More info about the VGs can be found on www.PrecisionAerobatics.com
The installation of the Vortex Generators (VGs) is very simple since the slots are pre cut. However, due to the opaque covering, a certain technique is required to find the hidden slots.

Four large wing tips will be used. One on each wing panel (outer side).

1- Start by placing the wing flat on a protected surface to avoid scratches to the covering.
2- place the VG on its side next to the wing tip with the mounting tabs 3mm(1/8") away from the edge to indicate the position of the slots to be exposed. The rear end of the VG must be aligned with the wing's trailing edge.
3- Pierce the covering in the estimated positions using a sharp pin. Pierce three to four holes through the entire length of each slot
4- Reveal the slots completely using a heated paperclip or a modelling knife.
5- Roughen the gluing tabs of all the VGs using a fine file or sand paper similar to what you did previously with the control horns.
6- Perform a dry test fit of the VGs into the slots and if you find a very tight fit DO NOT force them in as you may damage the balsa sheeting. Instead, do one of the two things: 1 – you may slightly sand the tabs thinner or 2- use a sharp modelling knife to slightly enlarge the slots. Do this with great care not to cause damage.
7- Once you are satisfied with the fit remove them and apply a layer of 30 minute epoxy on both sides of the tabs, and inside each slot. Make sure the entire base of the VGs are covered with epoxy and once fitted, add a small bead of epoxy along the entire joint as this will create a solid base and seal the gap with the wing skin. Make sure to push them all the way to minimize any gap.
8- Now verify from the front of the leading edge that each VG is perfectly perpendicular to the wing surface (90 degrees) and if not use paper masking tape to correct the angle into a perfect 90 degrees and let it set before removing the tape.

DO NOT use CA as it is not forgiving and will not allow you enough time to fit the VGs properly and verify their angle. CA may set before the VGs are fitted all the way in which means a permanent damage. It will also not seal the gap and may stain the covering surface.



Slit open the VG slots

Apply a thin bead of epoxy along the joint

Note: Keep plane under cover and away from direct sunlight when not flown. That is to avoid the covering from fading, damage to canopy, wrinkles and warp of parts. Do not keep it in the car or garage as temperature rises affect the plane.

Official Academy of Model Aeronautics National Model Aircraft Safety Code

1. A model aircraft shall be defined as a non-human-carrying device capable of sustained flight in the atmosphere. It shall not exceed limitations established in this code and is intended to be used exclusively for recreational or competition activity.
2. The maximum takeoff weight of a model aircraft, including fuel, is 55 pounds, except for those flown under the AMA Experimental Aircraft Rules.
3. I will abide by this Safety Code and all rules established for the flying site use. I will not willfully fly my model aircraft in a reckless and/or dangerous manner.
4. I will not fly my model aircraft in sanctioned events, air shows, or model demonstrations until it has been proven airworthy.
5. I will not fly my model aircraft higher than approximately 400 feet above ground level, when within three (3) miles of an airport without notifying the airport operator. I will yield the right-of-way and avoid flying in the proximity of full-scale aircraft, utilizing a spotter when appropriate.
6. I will not fly my model aircraft unless it is identified with my name and address, or AMA number, inside or affixed to the outside of the model aircraft. This does not apply to model aircraft flown indoors.
7. I will not operate model aircraft with metal-blade propellers or with gaseous boosts (other than air), nor will I operate model aircraft with fuels containing tetranitromethane or hydrazine.
8. I will not operate model aircraft carrying pyrotechnic devices which explode burn, or propel a projectile of any kind. Exceptions include Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight. Rocket motors up to a G-series size may be used, provided they remain firmly attached to the model aircraft during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code; however, they may not be launched from model aircraft. Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined within the Air Show Advisory Committee Document.
9. I will not operate my model aircraft while under the influence of alcohol or within eight (8) hours of having consumed alcohol.
10. I will not operate my model aircraft while using any drug which could adversely affect my ability to safely control my model aircraft.
11. Children under six (6) years old are only allowed on a flightline or in a flight area as a pilot or while under flight instruction.
12. I will have completed a successful radio equipment ground-range check before the first flight of a new or repaired model aircraft.
13. I will not fly my model aircraft in the presence of spectators until I become a proficient flier, unless assisted by an experienced pilot. At all flying sites a line must be established, in front of which all flying takes place.
14. Only personnel associated with flying the model aircraft are allowed at or in front of the line. In the case of airshows demonstrations straight line must be established. An area away from the line must be maintained for spectators. Intentional flying behind the line is prohibited.
15. I will operate my model aircraft using only radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
16. I will not knowingly operate my model aircraft within three (3) miles of any preexisting flying site with out a frequency-management agreement. A frequency-management agreement may be an allocation of frequencies for each site, a day-use agreement between sites, or testing which determines that no interference exists. A frequency-management agreement may exist between two or more AMA chartered clubs, AMA clubs and individual AMA members, or individual AMA members. Frequency-management agreements, including an interference test report if the agreement indicates no interference exists, will be signed by all parties and copies provided to AMA Headquarters.
17. With the exception of events flown under official AMA rules, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and located at the flightline.
18. Under no circumstances may a pilot or other person touch a model aircraft in flight while it is still under power, except to divert it from striking an individual.
19. Radio-controlled night flying is limited to low-performance model aircraft (less than 100 mph). The model aircraft must be equipped with a lighting system which clearly defines the aircraft's attitude and direction at all times.
20. The operator of a radio-controlled model aircraft shall control it during the entire flight, maintaining visual contact without enhancement other than by corrective lenses that are prescribed for the pilot. No model aircraft shall be equipped with devices which allow it to be flown to a selected location which is beyond the visual range of the pilot or any device.
21. All model flying shall be conducted in a manner to avoid over flight of unprotected people. safety or lines excluding takeoff and landing, the pilot's helper(s)