Congratulations on your purchase of Precision Aerobatics

Katana 52

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. If 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

Equipment selection

At Precision Aerobatics we have gone to great lengths developing the KATANA 52 in order to provide you with an aircraft like no other. We have used many unique 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 KATANA 52 is one of the lightest aircraft in its class, with an incredibly low wing loading. These factors contribute to the outstanding flying characteristics of the KATANA 52.

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 KATANA 52 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 KATANA 52 was designed around the following gear. Please be aware that any deviations from these recommendations will result in degraded flight characteristics.

- **Motor** - PA Thrust 45R with Rotorkool® technology (PA Item #AC-1886-R) 177gr, 780kv 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 45R visit **www.ThrustMotors.com**
- **ESC** - PA Quantum 45 Pro Programmable Brushless ESC with built in Switching BEC (PA Item # AC-2189).
- **Propeller adapter** – 6.0mm CNC machined precision prop adapter for the rear mounted Thrust 45R (PA Item #AC-2327). Use only a good quality prop adapter that spins perfectly true otherwise thrust and efficiency will be lost and vibrations may damage the motor box.
- **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.
  VOX 13x5 wood (PA Item #AC-2105) **-** Excellent prop for slower 3D and flying in smaller fields. This propeller offers an excellent balance of speed and thrust for any type of flying when using PA V4 4s (14.8V) battery packs. Gives a feeling of flying a giant scale plane with unlimited thrust.
  VOX 13x6.5 wood (PA Item #AC-2107)**-** An excellent match with overall performance for fast aerobatics, high energy/high performance and extreme 3D when using PA V4 4s (14.8V) battery packs.
  We strongly recommend getting both propellers as they transformed the plane and gave a very different feel. See which one suit best your personal style and preference.
  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. A video showing how to check and balance your prop is available on our website. Use only propellers that are adequately sized to be within the specified limits of your motor.
- **Spinner** - 2.17" lightweight pre-cut PA Carbon Fiber spinner (PA code # AC-2219). Perfectly matches the Katana 52 cowl shape, retain optimum CG and avoid unnecessary weight.
- **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 or malfunction item # AC-1621
- **Battery** – PA V4 4s (14.8V) 2200-2600mAh 25-50c
  Note: different batteries will vary the motor's power output and amp drawn and might be under power or 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 45R range with the specified propeller. Please refer to the Thrust 45R data sheet available on www.Thrustmotors.com
- **Servos** – 4 x Nexatec NXT 80-DSM micro servos (PA item # AC-2240) or similar quality micro Servos.
- **Extension lead** – German made, thin gauge flexible extension lead for EP models 2M/6.5ft (PA item # AC-1713).
- **Compact Receiver** – Four or more channels full range FM, PCM or any full range 2.4Ghz (e.g. Spektrum AR6210, AR700, AR610 receivers).

  Warning: Plastic APC "E" props 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 KATANA 52 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 45R, 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 Katana is not an exception. The Katana 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 Katana 52 will be assembled using epoxy, it is recommended to have some Denatured Alcohol 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 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.

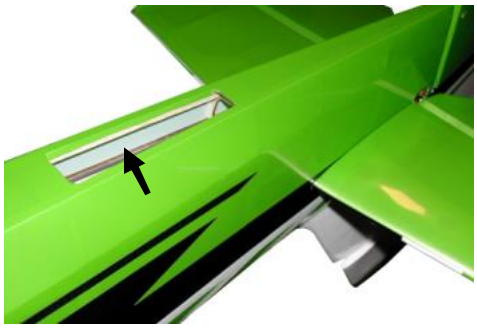
Making the Openings

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- aileron servo cables, wing bolts, elevator servo (cutout one side only), rudder servo (cutout one side only), landing gear, 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 from the inside to mark the location of the openings before cutting from the outside.

Note: There are two identical sets of servo openings on each side of the fuselage. Choose the side per your preference. Elevator servo should be mounted on one side of the fuselage (upper opening) while the rudder servo is on the opposite side (bottom opening). Make sure to cut the rudder and elevator control horn slots in the correct side of your servos final position.

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 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 landing gear bay, cooling exit and fuselage servo bays.



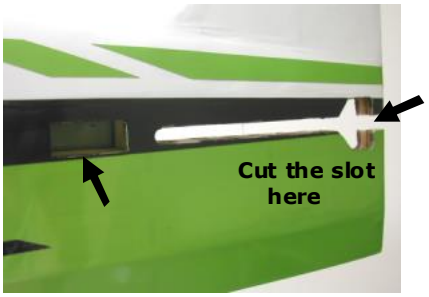
Air Cooling Exit

Under cut the covering

Rudder Servo Opening

Landing Gear Bay

Fuselage openings



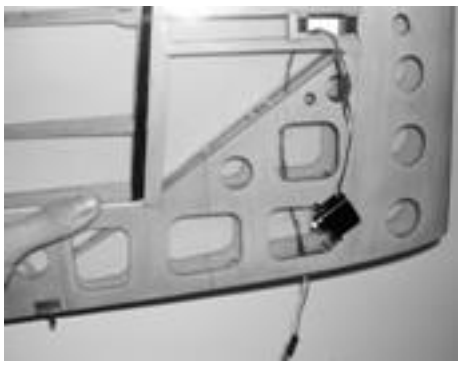
Stabilizer slot and Elevator Servo Opening

Aileron servo installation

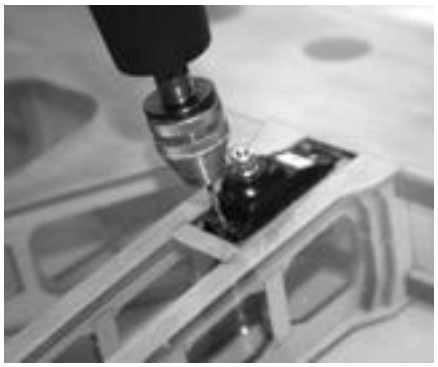
The aileron servos require a pair of 245mm/9.65" extension leads. We recommend extending the leads using a good quality lightweight servo extension to save on weight, avoid RF noises and voltage drop (PA Item Code AC-1713 is a German made low resistance flexible Extension Lead and is included in the 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.
Feed the cable through the inside of the wing out through the opening on the wing root rib. Insert the aileron servos with the output shaft closest to the aileron. In case of tight fit don't force the servo in, instead use a fine file to slightly enlarge the opening. Mark the center of the mounting tab hole to drill.

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 exactly centered.
Do not use excessive force as this may damage the servo tray. Screw and unscrew the mounting screws and then apply a drop of thin CA into each of the holes to set the thread. Once the CA has cured install the servo.
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.

PA Lightweight servo extension



Feed the extension lead through



Drill the mounting holes with care

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.

Aileron control linkages

First, select the two identical CF pushrods (91.5mm/3.60") and the control horns from your hardware pack to begin preparing them for installation. Note that the aileron control horns are the identical pair from the hardware pack of four CF control horns.

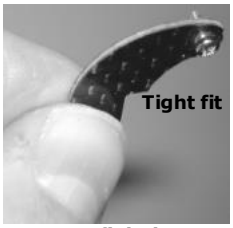
Lightly sand the base of the CF control horns to allow better gluing surface. Next slit the opening for the CF horns on the Aileron. Test fit the CF horn. If the fit is too tight; do not force the horn in. Instead, use a blade to carefully enlarge the opening until a perfect fit is achieved. Do not epoxy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

Locate the metal clevis from the hardware pack and use a paper rag soaked in denatured alcohol to thoroughly clean the inside of the hole where the CF rod inserts. Install the metal clevis to the aileron horn. The aileron's horn hole is 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 oversized hole would cause undesired slop. Later, do the same with the CF servo arms' mounting hole.


Install clevis

Secure the bolt with Loctite


File mounting hole



Test fit bolt


Elevator Rudder Aileron Aileron

Screw the clevis bolt and test for a smooth bind free movement. Do not over tighten to avoid "clamping" the fork of the clevis on the CF control horn. If binding occurs, lightly sand the sharp edges of the CF horn and clevis as well as slightly **widen clevis fork** until smooth bind-free movement is achieved. Once satisfied, apply permanent (red color) Loctite. You may also install the metal clevis for both the rudder and elevator at this stage.

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

With the servos centered in neutral, temporarily install the plastic servo arm. 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.

In order to achieve maximum control throws for 3D and to ensure proper linkage geometry we recommend using PA Carbon Fiber servo arms (PA Item Code AC-2211). Note that these are not included with the kit. If you have them, install them now. You may wish to do so for the elevator and rudder servos at this point too.
The CF servo arm's 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 in a similar way as you did with the aileron control horn.
Locate the plastic ball link and install it onto the CF servo arm with the ball on the bottom side of the servo arm. Install the aileron ball link in the servo arm **inner** mounting hole.
The order of assembly is M2x8mm bolt/ball link/CF arm/nut. Apply red permanent Loctite to secure the nut.

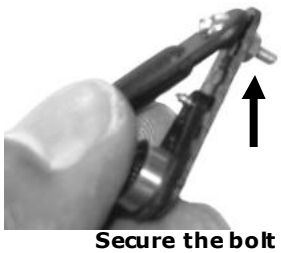
Note: some Loctite may run over the horn preventing the clevis from swiveling freely. Swivel the clevis rapidly a few times to get rid of any excess Loctite and if needed use a modeling knife to clean the horn surface.

Tip: we recommend trimming off (with a nail clipper) the plastic tab of the ball link so it will not rub against the plastic servo arm while swiveling at high angles.

Trim the tab off the ball link

Test fit control horn

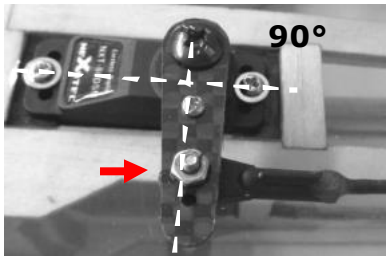
Notch pushrod end



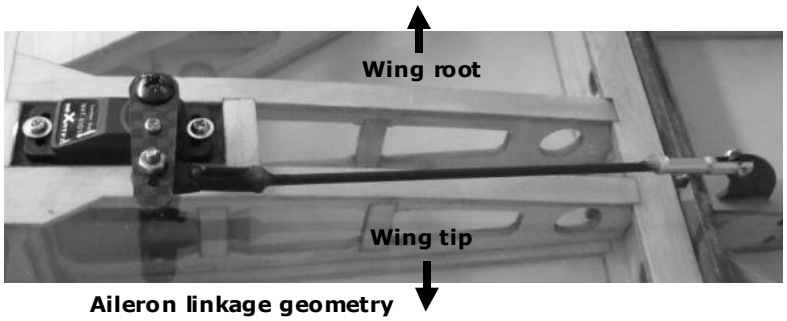
Secure the bolt with Loctite

Lightly sand, roughen and notch the ends (12mm, 1/2") of the two CF pushrods using a small triangle file to ensure a secure glue bond. With the servo arm installed and centered in neutral (90 degrees to the servo case) and the aileron taped and held in the neutral position, temporarily insert the CF pushrod into the clevis and line the other end up with the ball link. 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 radio later. **Tip:** CF rod best cut off with a sharp modeling knife.

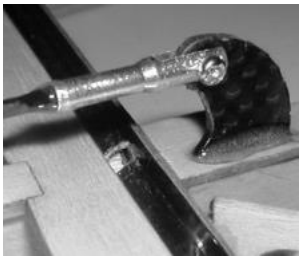
Once satisfied with the precise pushrod length and with the aileron already taped in the neutral position, apply 30 minute epoxy to one end of the pushrod and insert it into the clevis. Do the same with the ball link. Note that the pushrod should be pushed fully in and the ball link positioned **horizontally** to the clevis. Finally verify that the servo arm is also in the neutral (90°) position BEFORE the epoxy sets.
Do the same with the other wing panel.



Inner mounting hole



Aileron linkage geometry



Aileron control horn

NOTE: In order to get good servo centering and precise control, linkages should operate smoothly with minimum friction (linkages and control surfaces will also get smoother over time). Now, with the linkages fully installed, would be a good time to test them. Detach the servo arm and actuate manually the control surface by the linkage making sure it deflects freely. If overly tight, inspect the entire linkage and control surface where it binds. If it is the control surface that binds, inspect the aileron hinges closely and find the binding spot. With a sharp modeling knife, "shave" off a bit of balsa from the small rib through the hinge slot. You may use a small file to slightly widen or lengthen the slot.

Tail section

Elevator & Rudder servos

Prior to installing the servo, solder the servo lead extension (as described with the aileron servos). You will require a 520mm/20.5" long extension (if NXT 80-DSM is used). Install the elevator servo at the rear of the fuselage in the opening you previously cut in the covering film with the servo output shaft closer to the control surface as per the photo.

Carefully drill using a 1.5mm (1/16") drill bit and self tap holes as required for the servo mounting 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. If FM or PCM RX will be used the lead can be run over the CF braces to reduce RF noises.

Elevator servo

Tail extension leads

Rudder servo

Elevator & Horizontal Stabilizer

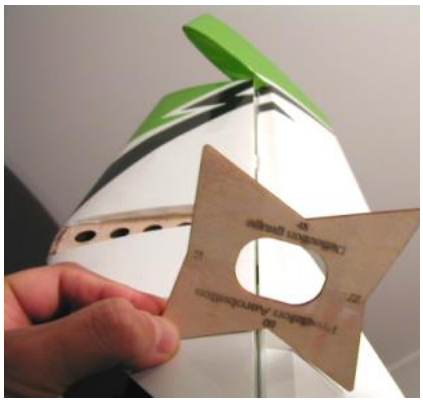
The stabilizer and elevator hinge slots are pre cut. All that is required is to set the elevator deflection and glue the hinges (four large hinges). Start by gluing the hinges into the elevator first (hinges fitted half way in).
To set the elevator deflection, fit the elevator into the horizontal stabilizer all the way in leaving no hinge gap. Ensure the hinges are aligned and centered, then deflect the elevator to approx 55° 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.

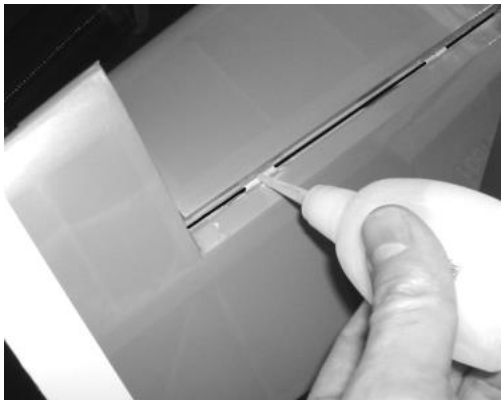
Take the supplied matched covering strip (according to your Katana color scheme) and crease them into a "V" shape. Trim the creased covering to the length of one-half of the elevator. Align it along the hinge line (top side of the elevator). Hold it in place and starting at one end, iron it down along 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 protection backing of the strips before using them, otherwise, they will not stick to the surface.

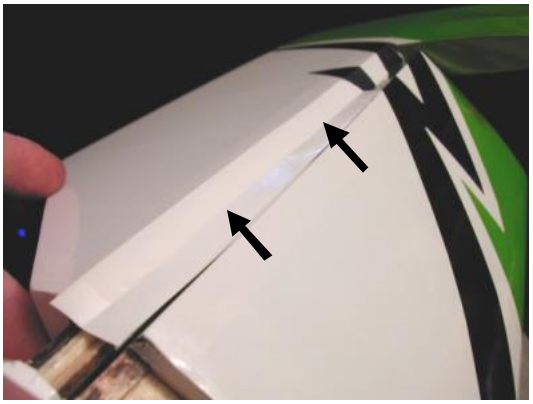
Sealing the elevator hinge gap is an **extremely** important step and an integral part of the Katana 52 design. Skipping this step will have a detrimental effect on the flight characteristics!



Deflect the elevator to approx 55° to set the hinge gap



Gluing the elevator hinges



Place creased covering strip in the hinge gap and iron

Iron in the covering strip

Small imperfections can be fixed using a black marker

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. 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.

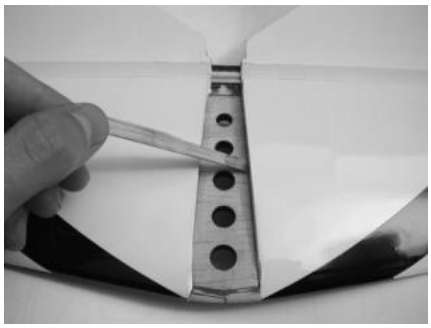
Next, you will need to align the stabilizer. Temporarily insert the wing tube to the fuselage. Looking from the rear check that the stabilizer is parallel to the wing tube (tape the elevator in the neutral position).
If the stabilizer is not parallel to the wing tube, remove the stabilizer and lightly 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.

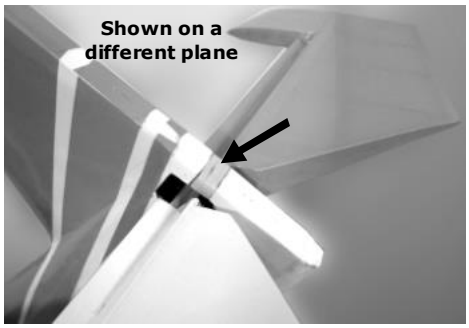
Once the stabilizer is in perfect alignment, remove it and apply a thin layer of 30 minute epoxy to the exposed balsa in the center of the stabilizer (both sides) and on the side of the stabilizer roots (Note: CA is not recommended here as it causes discoloration of the covering film and set too fast).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

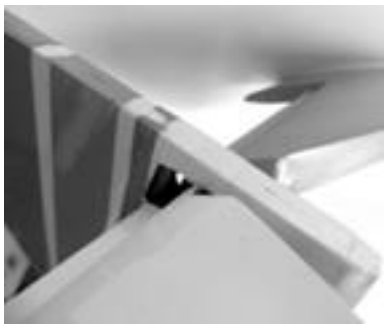
Once the glue sets, remove the masking tape and slide the supplied balsa wedge into the gap you previously cut at the rear of the fuselage. Being oversize, you need to lightly sand the balsa wedge (all around) until it fits flush with the fuselage. Do not attempt to force the wedge in as this could risk 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.



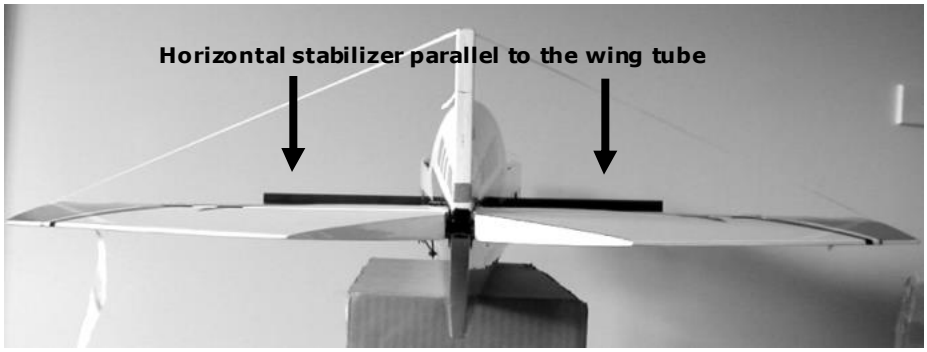
Apply epoxy to the stab center



Glue in the balsa wedge



apply covering over



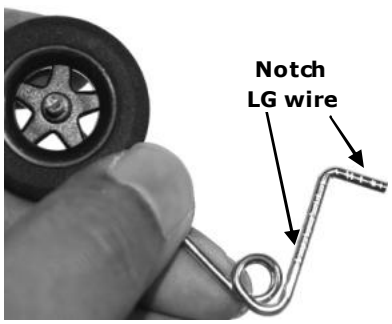
Rudder and Tail Landing Gear (LG)

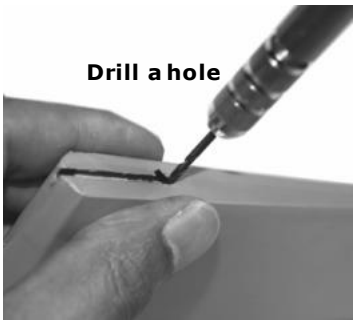
Locate the groove at the bottom of the rudder closer to the hinge line. Using a sharp blade, remove the covering to expose the groove. Test fit the tail LG in the groove, and mark the position of the hole to drill for the wire to fit in.

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 correct. 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 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, to your preference, and should be 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.

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.

Deflect rudder to maximum before gluing the hinges

Place creased covering strips in the hinge gap

Seal the entire hinge gap while rudder is fully deflected

Elevator & Rudder control linkages

Take the remaining two CF pushrods (99.5mm/3.91" for the elevator and 124.5mm/4.9" for the rudder) and the control horns from your hardware pack to begin preparing them for installation as per what was previously done for the ailerons. Next expose the slots for the elevator and rudder control horns.
The rudder pre-cut slot is located 11mm measured from the bottom and the elevator 5.0mm measured from the root rib.

Test fit the CF elevator and rudder 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.
Proceed to install the metal clevises, plastic ball links and CF push rods in the same manner as the ailerons.
For correct linkage geometry use the PA 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.

CF rudder control horn

Rudder linkage geometry

CF CNC machined rudder servo arm

CF CNC machined elevator servo arm

Elevator linkage geometry

CF elevator control horn and clevis

Motor Box

When assembling your Katana 52 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 50 setup.

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 45R 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 Katana 52. For technical data on the Thrust 45R please visit **www.thrustmotors.com** and download the data sheet.

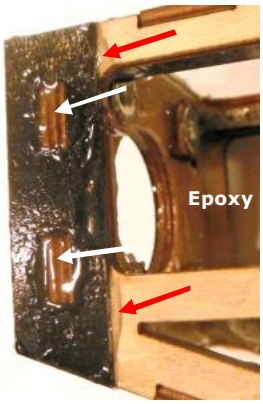
CAUTION- Once glued the motor box is extremely robust, however, following any crash, propeller ground strike or hard landing it is essential that the cowl be removed and all joints inspected for cracks and repaired as required. **Do NOT use any imbalanced, oversized, chipped propellers or with an off-centered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

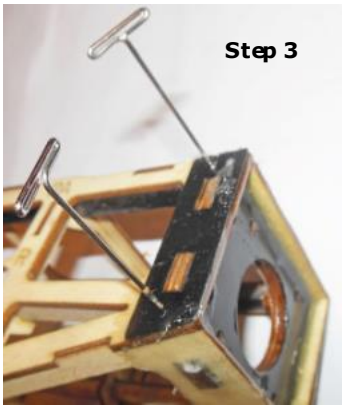
If your motor box broke due to a crash we recommend that you don't attempt to repair it as it may fail in flight. Replacement motor box is available (see replacement parts list at the end of this manual). Instructions and video on how to replace it are available on our website.

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 45R 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.





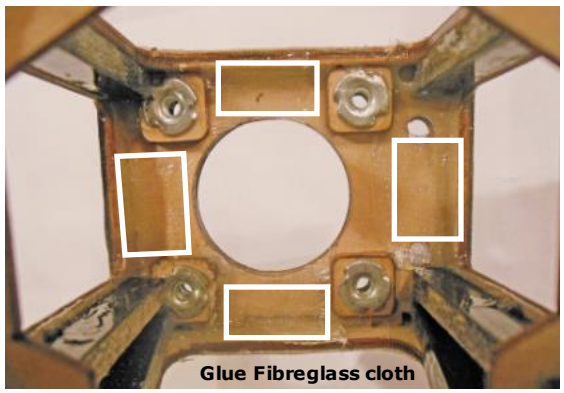
2. Make sure your X mount bolts are 10-12mm long. Due to the thick mounting plate in PA models, shorter bolts may strip the thread and cause the motor box to fail under the extreme thrust. Caution: Too long aftermarket bolts may hit the winding causing a short circuit!
It's recommended to use temporary (blue color) Loctite on all mounting bolts.

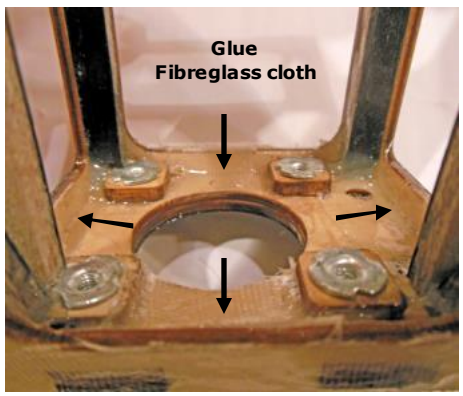
3. Locate the supplied composite plates and place them over the motor box sides in order to differentiate LEFT and RIGHT hand side.

Lightly sand/roughen one side of each plate to allow better gluing surface. Apply a medium layer of slow cure epoxy 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.

4. Verify with a ruler that the CF corner 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 Katana flight performance, therefore, if needed, sand/file the rear ends of the stringers flush with the motorbox ply.

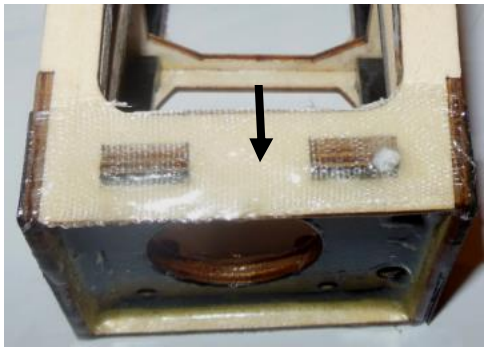
5. Cut the supplied fiberglass cloth to fit the four inner sides/corners of the mounting plate (see photos).
Brush epoxy along the seams of the mounting plate (top bottom and sides) including corners. Then place the fiberglass cloth over each seam/side (**keep blind nuts clear of epoxy**) and brush a 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.



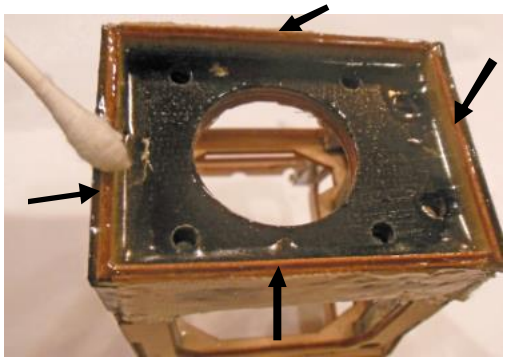


6. Cut to half the remained fiberglass strip. Brush epoxy over the outside top and bottom sides including corners. Then place each strip over and brush a thin layer of epoxy on top to soak in. Using a flat tool tuck the wet cloth into the seams and corners leaving no gap with the ply. Let it dry. Continue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

Brush epoxy



Place fiberglass strip over and brush epoxy on top

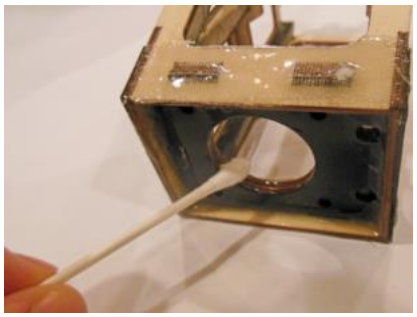


Epoxy over the front fra me

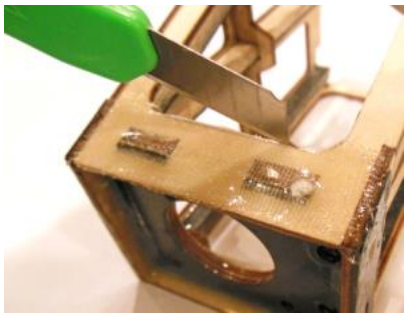
7. Using a cotton swab apply a thin layer of epoxy in the mounting plate vent holes except the mounting bolts' holes. wipe off any excess where the motor will be mounted.

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

9. 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

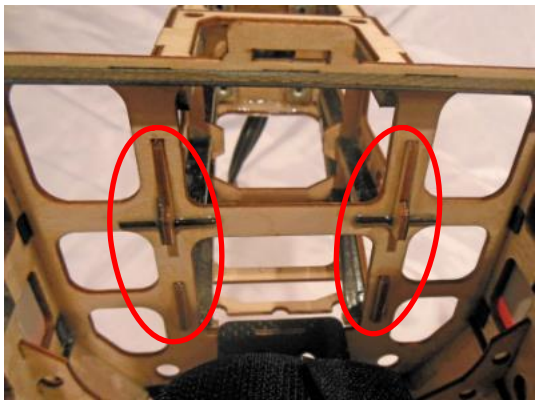


Trim off overhanging fiberglass cloth

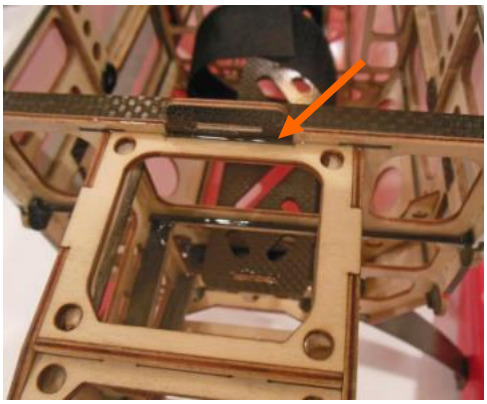
Do not force the motor box into the slots. If it is too tight use a fine file to slightly enlarge the slots until a perfect fit is achieved. If the carbon pins are difficult to insert, use a round needle file to slightly enlarge the holes or taper the pins. The long rod in front of the bulkhead should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

Once satisfied with the fit, apply epoxy to all the surfaces coming into contact with the bulkhead **EXCEPT** of one spot at the center top (see photo). Next insert all CF pins and apply epoxy to cover them. 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.

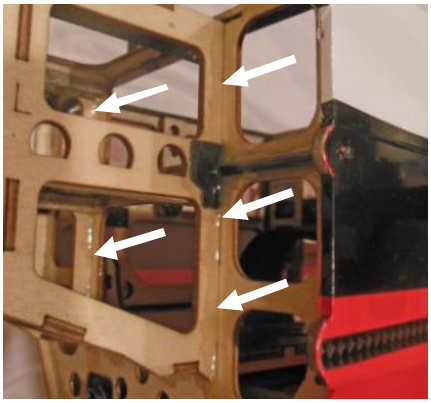
10. Hold firmly the motorbox against the bulkhead to eliminate any gap and apply a few drops of medium CA to the center top spot of the motor box which was left without epoxy to "tack" it in place. Next, run a thin line of epoxy along the entire seam between the motor box and bulkhead. Alternatively you may use a clamp at the center top and omit the CA.



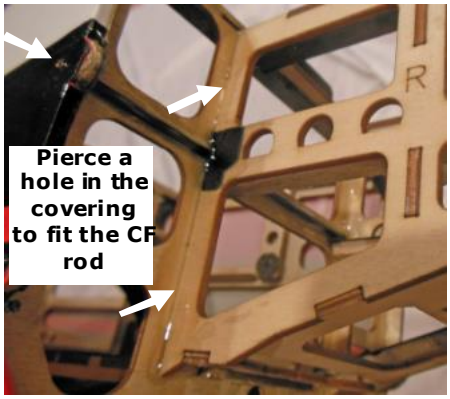
Glue motor box lugs and CF pins



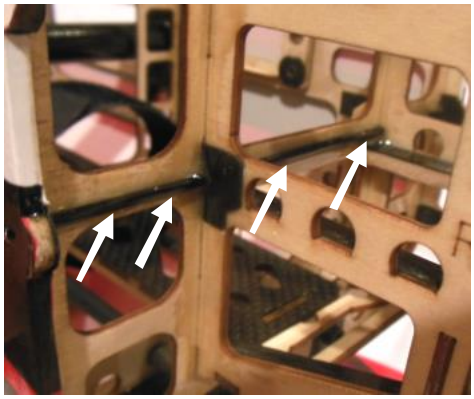
CA spot glue



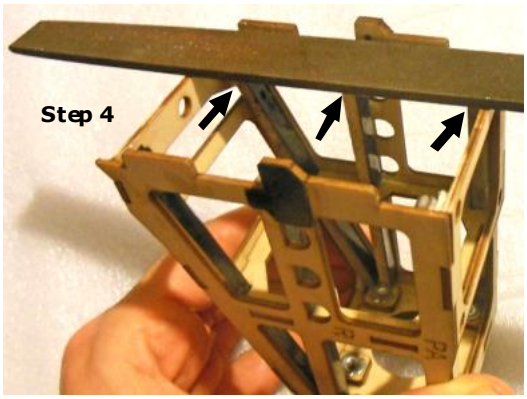
Leave no gap between motorbox and bulkhead



Epoxy ALL seams of the motor box with the bulkhead



Cover the entire CF rod with epoxy



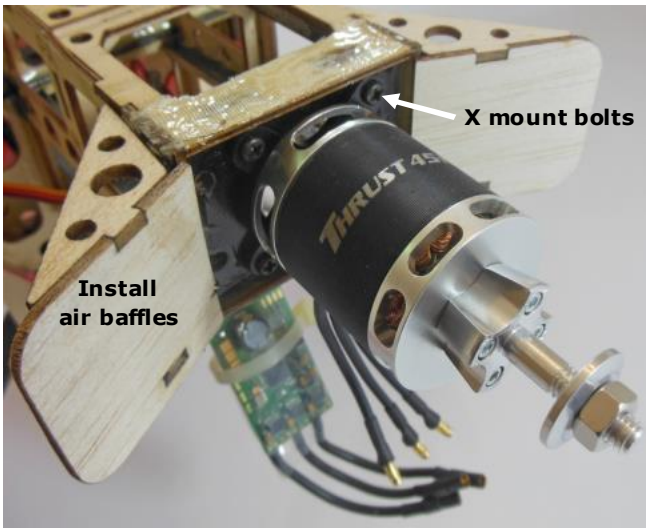
Verify CF corner stringers do not protrude

Motor and ESC Installation

Install the Thrust 45R motor in front of the firewall using the supplied mounting bolts. **DO NOT under any circumstances enlarge/modify the motor shaft opening or mounting holes of the motor mount**. The motorbox is pre-drilled to accommodate the Thrust 45R motor, therefore the installation is a breeze and a matter of fastening four bolts. Note: if there is any epoxy over the mounting plate that may obstruct the X mount from sitting flush, scrap it off with a sharp blade as it may result in an incorrect motor thrust angle.

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. Double check the bolts after the first day of flying whether they got a tad loose which in this case re-fasten them a bit.

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 cooling inlet. In order to do so an extension lead must be used on the ESC Rx cable. Solder a 100mm/3.94" lead to the existing cable properly using heat shrink tubes over each solder you have made, 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 to the motor box using zip ties with the heatsink facing down (see photos).

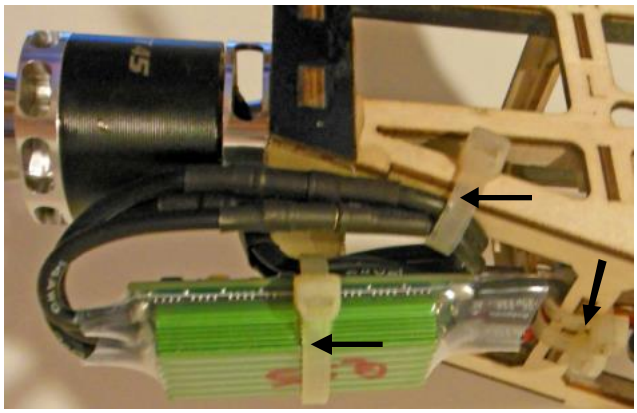


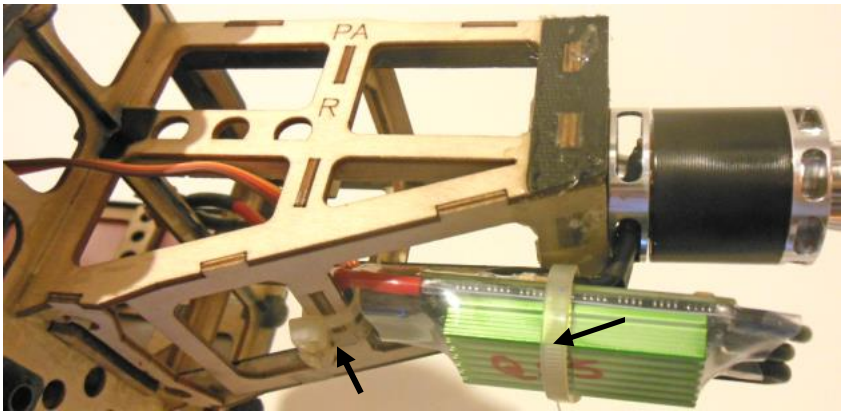
NOTE: Install the motor with the cables positioned downwards.

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

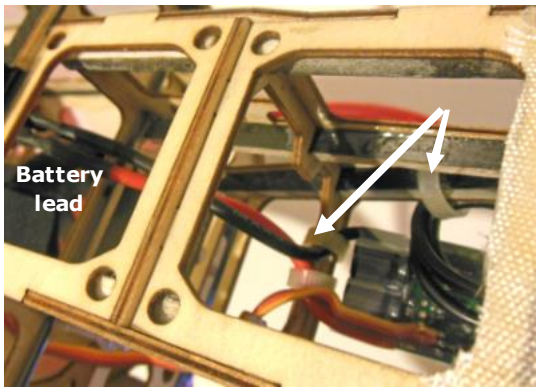
Verify the correct motor rotation direction (should spin clockwise from pilot view). If it doesn't, power down the ESC and swap the positions of any two motor cables or reprogram your Quantum ESC for reversed rotation. We recommend removing the propeller as a safety precaution before powering up the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

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/battery.



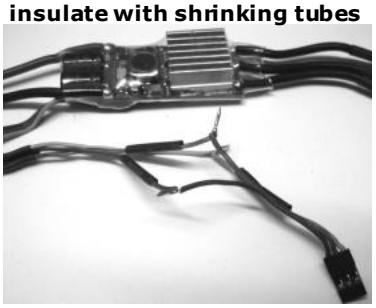


ESC installation (zip ties)



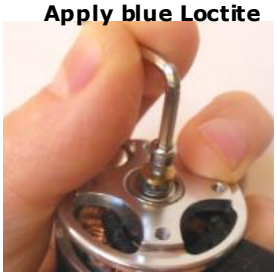
RX lead

Solder an extension lead and insulate with shrinking tubes



X mount & bolts

Apply blue Loctite



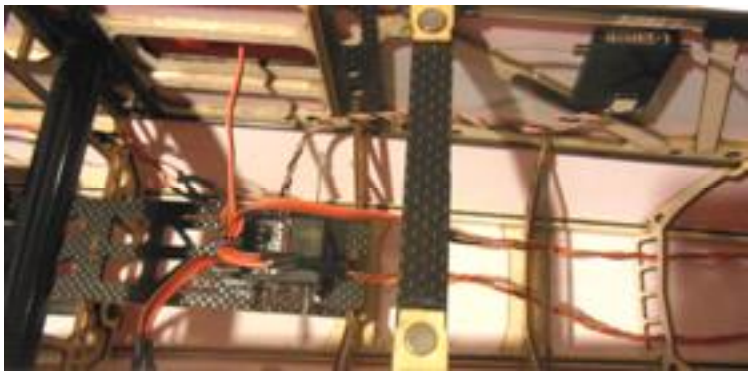
Receiver and battery Placement

It is important to properly route the RX aerial to avoid any RF noises. If conventional FM/PCM receiver is used run the aerial a distance away from the servo leads and CF members along the outside bottom center of the fuselage towards the rear. Run the aerial in zigzag and not parallel to the servo leads.
Do not attempt to shorten your aerial or wind it in a coil as this reduces the effective range (Keep it fully extended). 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 battery is held in place on the battery tray using the supplied Velcro strap (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.

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.



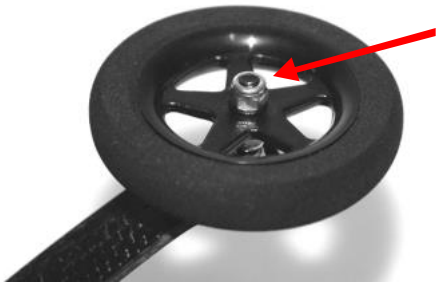
Spektrum 2.4GHz receiver installation

Thick double sided Sticky tape

Battery pack

Landing Gear struts (LG)

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 M3x20mm bolt/axle in the pre-drilled hole. The order of hardware is: Bolt/ Black Washer/CF gear strut/ Two lock nuts /Wheel /Lock Nut.
The wheel should be captured between the two lock nuts 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 and if too tight there will be excessive loads on the LG during landings. 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 temporary Loctite on the outer nut to avoid it from fastening or loosening after time.



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") 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, if it becomes too tight remove it and enlarge the hole slightly. 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. **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.

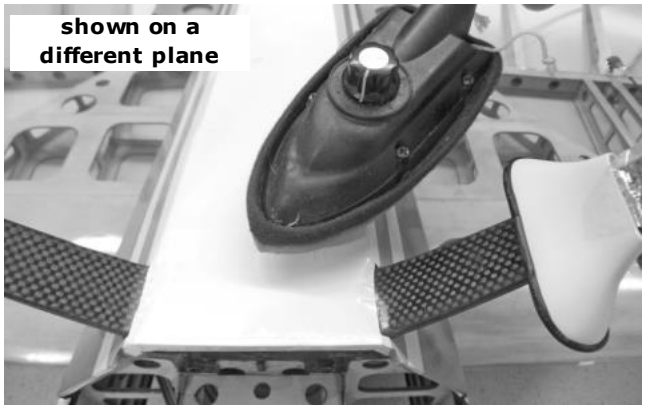
Installing the Landing Gear

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

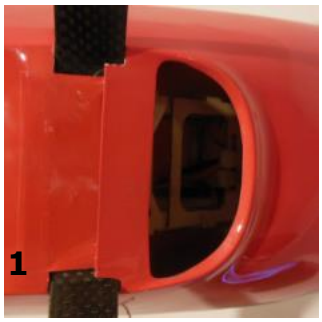
Cowling Attachment

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. Prior to fitting the cowl it is required to install the motor, prop adapter and to have the hatch fitted to the fuselage. Once cowl is fitted, install the spinner backplate and align it perfectly with the cowl front ring (photo #4). This ensures that the location of the cowl could be adjusted for a precise fit.
Mark the center of the mounting tabs 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 slight 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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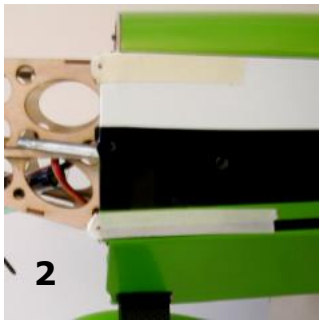
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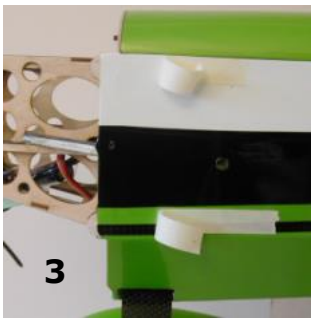
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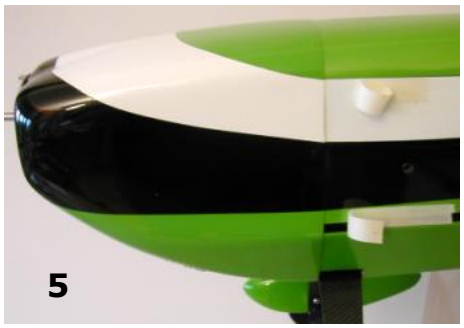
Note: With the air baffles glued in place, you would need to tilt the cowl on its side in order for it to fit. Then fit the top side of the cowl over the hatch first by tilting the hatch downward under the cowl overlap then straighten it. Now, guide the bottom of the cowl with your finger (through the bottom vent opening) over the bulkhead.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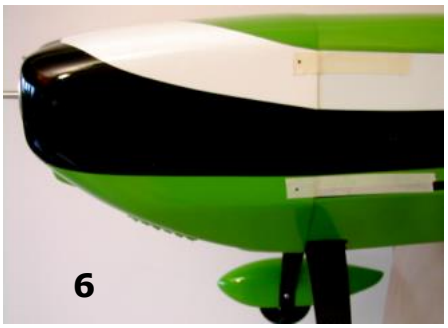
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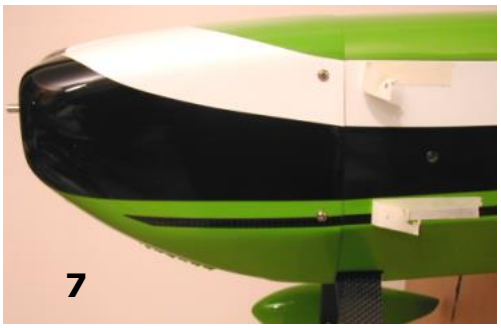
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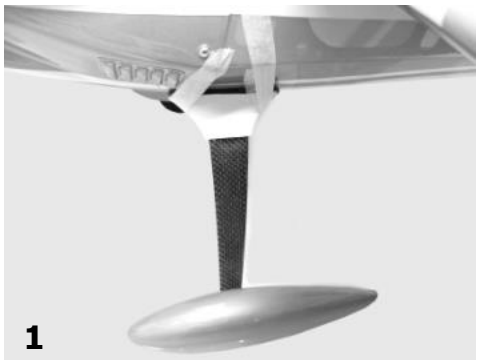
Press the cuff against the fuselage minimizing the gap and mark the lower end of the cuff on the LG strut with a small piece of sticky tape. Then stick a thick foamed double sided sticky tape from your mark up and press the cuff against it while minimizing any gap between the cuff and fuselage. Do the same with the other cuff. If needed, you may trim the cuffs with scissors to a perfect fit with the fuselage.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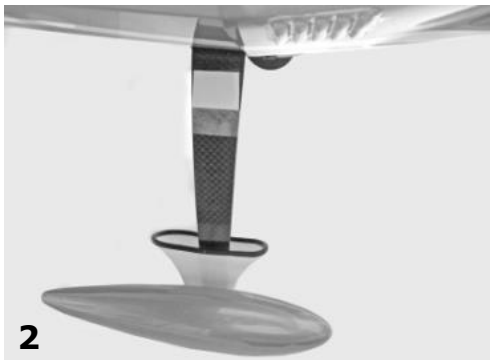
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3

Note - Katana 52 is not supplied with the black rubber tube

Propeller, spinner and prop adapter 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 Katana 52 cowl shape, to retain optimum CG and avoid carrying unnecessary weight. You can temporarily place a spacer in between the backplate and the cowl to get a minimal gap while fastening the prop adaptor. It's recommended to use temporary Loctite on the propeller adaptor mounting bolts.

Note: While fastening the propeller nut, hold the 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 Katana 52 due to the higher amps drawn and vibration which can lead to a motorbox failure.

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 that:

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 blades openings are undersized, therefore, hit the blades. Enlarge the openings with a file to allow an even gap around the propeller.
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.

Wing Attachment

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.

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 sand the ends 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 two anti rotation pins into the fuselage. If after you fit one wing panel the anti rotation pins of the other panel would not align easily, remove the wing panel and install the other wing panel first.

Prior to installing the nylon wing bolt, dip the tip of the bolt into some silicone grease to add lubrication (otherwise the bolt may have tight fit and could sheer off if excessive force is exerted). If, for any reason the bolt still feels tight to fit, do not force as there could be dirt or corrosion build up on the threads of the blind nut. Instead, remove the bolt and insert a 4.0mm metal bolt to "clear" the blind nut threads. Secure the wing in place with the nylon wing bolt but don't over tighten the bolt and take care not to cross thread the bolt.

Next install the other wing panel onto the CF wing tube. If for the reasons below (*) there is a gap between the wing and the fuselage, remove the wing and carefully sand short one end of the CF tube slightly and refit the wing. Do not attempt to force the wing onto the wing tube. Secure the wing in place with the other nylon wing bolt.
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.

(*) A few factors need to be taken into account when inspecting a gap at the wing root. Firstly, weather-related-shrinkage of the wood and the covering may cause a gap that is unavoidable. Secondly the Katana 52 has a very long wing root, and as such production tolerance allows for some gap to be present.
If a gap is present simply follow the step above and sand down the wing tube to improve the fitting.

Center of Gravity (CG)

The Katana 52 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 battery fore or aft on the battery tray. It is **very important**, regardless of chosen setup, to check (on the bench) your model's center of gravity as accurately as possible as it will dramatically affect your Katana 52 flight performance. Take your time to do it right.

The CG range is 112-118mm measured aft from the leading edge at the wing root. However, this plane performs at its best with a CG of 115mm and with the optional CF Vortex Generators installed (PA Item code # AC-2319). CG of 112mm is more for sport/IMAC flying or in windy condition.

NOTE - The Katana 52 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 **115mm** 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 so no KE mixing is needed. If you find the plane too neutral for you or it's a windy day, you may choose to set it at 112mm 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 115mm to get better overall performance.

Tip: Multiplex CG gauge is highly recommended to obtain an accurate set-up (PA item code# MPX693054). Make sure to use a small level gauge to level the tail while checking the CG (remove it before taking the read making sure the tail remains in the same position). Any small deviation of the CG will **greatly** affect the flight performance! Note- Plane should be placed upright with ALL the gear installed including wheel pants, hatch, prop and spinner while setting up the CG.
NOTE: EVERY 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.

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

Using the supplied deflection gauge, 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.

All the figures in this table are approximated		
Control surface	**High rates**	**Low rates**
Ailerons	Approx 45° Up and Down Expo: 70%	12° Up and Down Expo: 30%
Rudder	Left and Right (maximum) Expo: 70%	25° Left and Right Expo: 35%
Elevator	approx 50°-55° Up and Down Expo: 70%	12° 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.

Initial Flight timer settings

Unlike older lithium polymer (LiPo) packs where a drop of performance is usually noticed at the last quarter of the flight warning the modeler to land, PA 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 (Low Voltage Cutoff) is being activated. As such there may be instances that a modeler 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. As flying style affects current consumption and flight duration may vary from one modeler 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.

If using our recommended iPAs® setup you may start by setting up your TX timer to 5:30 minutes and adjust it as explained above. Typically you can expect anywhere between 6-8minutes of flight duration.

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 knots wind). It may be early morning or late evening. It is vital to do some good bench tests (outdoor) pointing the propeller away from you or anybody around and yank the throttle from min to max power a few times. That is a harsh test that will apply a lot of loads but will verify the prop adaptor is firmly installed (otherwise it may fly off) and that the gear is working properly and propeller is balanced (no vibrations!!).

Check servos and linkages for proper movement before take off.

Applying the Decals

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

Apply the supplied CF decal strips on both sides of the cowling to match the fuselage trim.
Note: remove the screw to ease the process then pierce the decal to locate the screw hole and refasten the screw

Carbon Fiber Vortex Generators installation

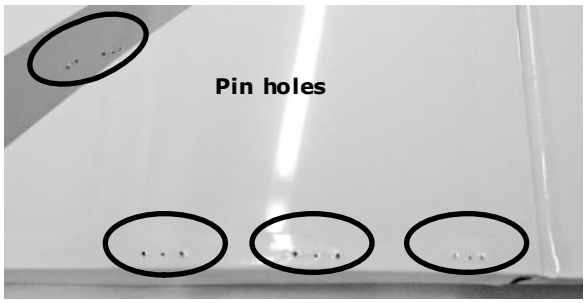
If you purchased the optional CF Vortex Generators (PA Item code # AC-2319) designed for the Katana 52, now you can install them. The CNC machined CF Vortex Generators will enhance your Katana 52 flight characteristics in slow high AOA flight, 3D and Knife Edge tracking and will add the funky look to your plane. We highly recommend them to complete the aerodynamic design of the Katana 52 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, since the top side covering is solid it requires a certain technique as follows:

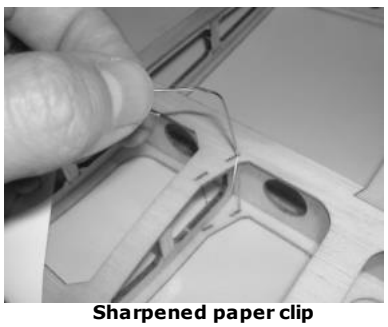
1- Start by placing the wing up side down (translucent covering facing up) on a flat protected surface to avoid scratches to the covering.
2- Using a heated paperclip or a sharp modelling knife reveal the pre cut slots on the bottom side of the wing (translucent covering). One VG slots falls over the white trim which will require a bit of guesstimation. A powerful flashlight is very helpful locating the slots through the opaque covering.
3- Use a sharp long pin or a sharpened paper clip to pierce the upper slots through the bottom side slots that you just revealed. Pierce three to four holes through the entire length of each slot. Since this is done through the translucent covering it is very easy to pierce at the correct location of the slots without causing any cosmetic damage. Flip the wing to its other side (solid covering facing up). Now looking at the pin holes you've pierced you can see the exact locations of the slots. Reveal the slots completely using a heated paperclip or a modelling knife.
4- Roughen the gluing tabs of all the VGs using a fine file or sand paper similar to what you've done previously with the control horns.
5- 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 down the tabs to be thinner or 2- use a sharp modelling knife to slightly enlarge the slots. Do this with great care not to damage.
6- Once you are satisfied with the fit remove them and apply a layer of 30 minutes epoxy over the tabs (both sides) and inside each slot. Make sure the entire base of the VGs is covered with epoxy and once fitted in leave a bit of epoxy excess which will create a solid base and seal the gap with the wing skin. Make sure to push them all the way in so no gap is present.
7- 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 a sticky tape (preferable paper-sticky 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 cause some stains in the covering surface.

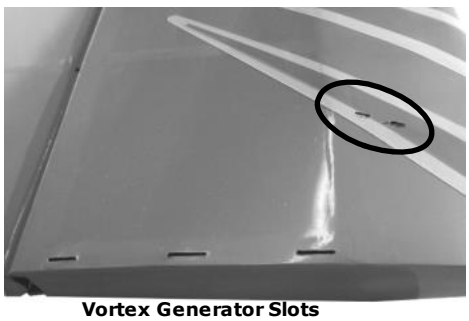
Following the steps in this sequence is a guaranteed method to success!

Shown on a different plane

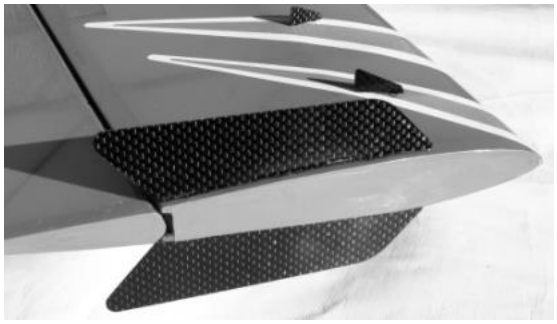


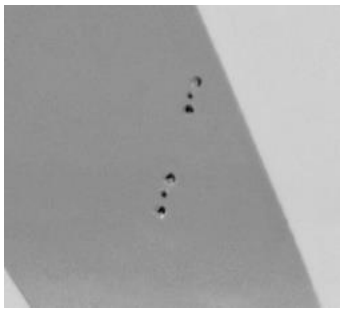


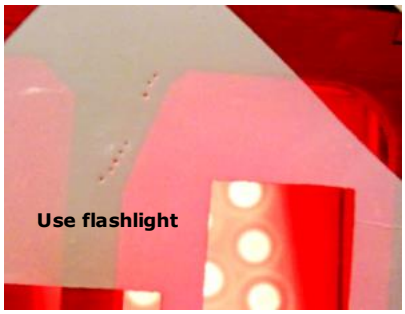
Sharpened paper clip

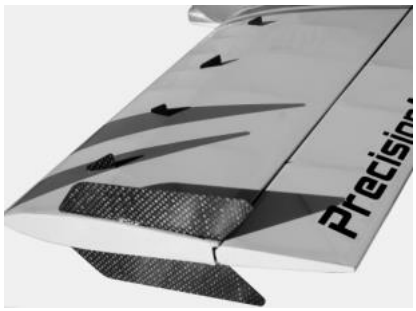


Vortex Generator Slots









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.

Katana 52 Replacement parts list

We believe that you will enjoy your Katana 52 for a very long time. In the event of inevitable mishaps and broken parts, all you need to do is to order replacement spare parts to restore your Katana 52 and be back in the air.

AC-2267	KATANA 52 CF main landing gear	AC-2324	KATANA 52 fuselage
AC-2125	KATANA 52 Tail wheel assembly inc. tail wheel	AC-2325	KATANA 52 Tail Feathers
AC-2315	KATANA 52 Tinted canopy/hatch	AC-2311	Solid grey covering 60x200cm roll
AC-2316	KATANA 52 Fiberglass cowl	AC-2024	Solid red covering 60x200cm roll
AC-2260	KATANA 52 fiberglass wheel pants set	AC-1651	Red translucent covering 60x200cm roll
AC-2261	KATANA 52 carbon fiber wheel pants set	AC-1660	Blue translucent covering 60x200cm roll
AC-2328	KATANA 52 carbon fiber wing tube	AC-1654	White cover 60x200cm roll
AC-2131	KATANA 52 Pair of wheels w/ wheel axles	AC-1657	Metallic blue covering 60x200cm roll
AC-2317	KATANA 52 Motor mount	AC-2326	Thrust 45R motor shaft
AC-2318	KATANA 52 CF control horns - set of 4pc	AC-2327	Thrust 45R propeller adapter and mounting bolts
AC-2319	KATANA 52 vortex generators set	AC-1886R	Thrust 45 outrunner brushless motor
AC-2274	KATANA 52 custom made wing bags set	AC-2189	Quantum 45 Pro 45A ESC
AC-2320	KATANA 52 balsa air baffles set	AC-2312	KATANA 52 iPAs Drive
AC-2321	KATANA 52 right wing (pilot view)	AC-2313	KATANA 52 iPAs Xtreme
AC-2322	KATANA 52 left wing (pilot view)	AC-2314	KATANA 52 Bling package
AC-2323	KATANA 52 wings set	AC-2314-M	KATANA 52 iPAs Xtreme Minus airframe

Optional Extras

Carbon fiber micro long servo arms for perfect linkage geometry.
(PA Item # AC-2211)

Set of 4 Carbon Fiber servo arms specifically designed to achieve full control surface movement required for 3D flights with the correct linkage geometry to fit the KATANA 52. Incredibly light weight and accurately CNC machined in our facility. Snap installation - No glue required
Hardware and instruction are included.

PA Carbon Fiber 2.17" Ultimate Style CNC machined pre cut spinner
(PA Item # AC-2219)

The PA 2.17" Carbon Fiber spinner is a perfect match to your KATANA 52. The combination of precision CNC machined Aluminum back plate and our German made precision prop adapter allows true spinning without motor's performance deterioration.

The new CF spinner is incredibly lightweight and has a beautiful shiny finish.

Note that the prop adapter is not included with the spinner. We DO NOT recommend using a poor quality prop adapter, such as those supplied with most motors available on the market. Poor machining results in un-centered spinning and excessive vibrations which will affect the motor efficiency and performance, and may in the long run cause damage to the spinner cone and wear out your motor's ball bearings.

All spinners are tested in our facility (using our German made prop adaptor) to verify they spin centered and true before shipped.

KATANA 52 carbon fiber wheel pants set (PA Item # AC-2261)
It is recommended to get a set of CF wheel pants as a spare set so after many happy landings you'll be able to upgrade the fiberglass wheel pants to the carbon fiber ones. the CF wheel pants are stronger and generally will last longer than the stock fiberglass pants.

KATANA 52 custom made wing bags set (PA Item # AC-2274)
A real must for carrying the KATANA 52 wings (especially when you have the vortex generators installed). Made of strong canvas and padded with thick foam to protect your wings in transport.

A5 sticker sheet (PA Item # AC-2027)
PA A5 sticker sheet – same as the decal sheet supplied with your KATANA 52

Prop adapter puller (PA Item # AC-2163)
Suitable for 5mm shaft, this puller is designed for easy removal of jammed prop adapter from the motor shaft without damage to your motor shaft or model. No more bent shafts!! no more destroying your new propeller adaptor or cracking the cowling and motor box!!!

Vox Electric Prop quiver bag (PA item code AC-2160)
Vox propellers offers a high quality double padded propeller quiver bag, made of strong durable canvas on the outside and smooth fabric on the inside. The Vox quiver bag is closed from all sides so the propellers cannot slip out by mistake, yet you can easily insert and remove them, and is comfortable to carry. The bag holds 8 propellers up to 16" in length and is sold for only $14.95.

Take advantage on the great discount in our **Bling package** including CF spinner, CF Vortex generators (complete set), CF wheel pants and custom made wing bags at **HUGE discount**! (**PA Item # AC-2314**)

Padded Lipo carry bag (PA Item # AC-2161)
Carry your batteries to the field in a padded enclosed bag that protects your lipos.
Two lines of pockets allow up to 20 Lipos, or can be used for only 10 packs with and once discharged move the pack to the "Discharged" pockets

PA How to 3D DVD (PA item Code AC-2286)

This DVD will take you step by step through the process of learning to fly 3D maneuvers. You will learn from PA team pilots, through video and commentary, starting with the easier to perform 3d maneuvers and moving on to the more complex show stoppers.

Each maneuver has its own separate video clip demonstrated with real flying footage. Flight demonstration by PA team pilot Daniel Dominguez with the radio in Mode 2. The videos have a real time transmitter overlay on the screen so that you can seewhat stick movements are required as the maneuver is performed and at the same time the comentary talks you through the maneuvers, allowing you to master them in the shortest time possible.
Also included are many "tips" that make learning to fly 3d so much easier.
Each video has its own chapter on the DVD menu that makes locating and reviewing them quick and easy. So now anyone can learn to fly 3D.
Manuevers included: Elevator, Parachute, Wall, Harrier, Knife Edge, Knife Edge Elevator, Waterfall, Flat Spins, Blender, Hover, Torque Roll, Snap to Hover, Knife Edge Spin, Rolling Harriers and also includes over 44 minutes of bonus materials!

THRUST®

High Performance Brushless Outrunner motors with RotorKool® Technology
The development of our new PA Thrust™ motors has followed our traditional design philosophy employed in our aircraft; which is doing things better. Thrust™ motor is one of the coolest running high performance, high-torque and high efficiency brushless motor ever produced to date. The design incorporates our latest innovation, RotorKool® which keeps the stator core material, the low resistance windings, highly permeable stator plates, high quality NMB Japan triple bearings and powerful neodymium magnets at optimum operating temperatures regardless of duration or the number of consecutive flights made*.

*provided sufficient airflow is permitted.

Visit www.Thrustmotors.com to download data sheets | 2 years warranty for all Thrust motors and Quantum ESC!

Why Get a Thrust motor?

We believe that if you chose the best model plane out there you'll want to get the most out of it
the answer is our iPAs® set up including Thrust® motor and Quantum Pro ESC!
A winning combination thoroughly tested with proven performance.
Go to ***www.vimeo.com/channels/PrecisionAerobatics*** to watch hundreds of videos of Precision Aerobatics models using Thrust / Quantum setups.

iPAs Integrated Performance Airframe-Drive System

VOX HIGH END PROPELLERS **www.VoxProps.com**

These must be the best Electric wooden propellers out there!
Vox electric propellers are made of Ultra light, high quality German Beechwood allowing higher acceleration rate and thrust, combined with precision, which is a "MUST" for high performance airframes, and is an added bonus for the less demanding EP R/C aircraft.
Vox props have been thoroughly tested as part of our iPAs® packages and feature GREAT value for money!
If you want your plane to perform like the ones in our videos get a Vox prop!
Made by Xoar to Precision Aerobatics high standards!

Quantum™ PRO with switching BEC **www.Thrustmotors.com**

The PA Quantum is a performance enhanced Brushless Electronic Speed Controller specifically designed to seamlessly match our Thrust motors.
The ESC come pre programmed for the Thrust motors so it's only a matter of plug-and-play.
The Quantum ESC is only geared for one thing: to allow you to execute the most challenging maneuvers with ABSOLUTE confidence in your drive system. Visit our website for more details and discounted combos.
ALL ESCS are equipped with Switching BEC.

Addiction XL ARF

www.Addiction3D.com

Wing span - 59" /1500mm
Length - 62.40" /1585mm
Flying weight (including batteries & spinner): approx 2080g / 73.4oz!
Wing area - 1055 sq. in !!!

Motor PA Thrust 50 outrunner motor
ESC PA Quantum 70A Pro ESC with SBEC
Battery Two PA LiPo pack 11.1V 2200mAh (or a 6S 2,200mAh)
Propeller VOX 15x8 / 16x6 prop wooden propeller
Servos Four Hitec HS-5245MG Mini digital servos

Yes, it's a larger Addiction, but in many senses this is a new design – like any other PA plane, this too has been taken to a whole new level. Being the third release in 'NEXT Generation PA' it allows you to do a lot more than you would expect. Despite being a 3D plane in every aspect, it is extremely stable and precise - capable of impressive precision aerobatics manoeuvres with a feel much like a 150cc airplane.
Don't be misled by the wing span – this model is HUGE. In fact it is PA's first entry into a new class of XL size planes with a wing area of 1,055 sq. inches (similar wing area of most 70" class aerobatic models on the market today).

The size of this plane makes a huge difference in the flying capabilities and flight envelope. The Addiction XL's lightweight and unique aerodynamic design means its iPAs set up (for ultimate hardcore 3D performance) is an economic Thrust 50/Quantum 70 combo with two 2200mAh 3S packs in series, or one small capacity 6S pack. This means you get to fly this massive plane at a very minimal investment compared to other models of its size – then again – there really is nothing like it.

Up until the Addiction XL - when you thought of a 3D dedicated airframe, automatically you would not expect it to track well or perform accurately. The Addiction XL will surprise you as it tracks better than any other Addiction or other 3D plane of its size. The generous tail section means awesome tail authority and the ADXL advanced aerodynamic design allows you to do incredible elevators, knife edge loops, high alpha knife edge, rock steady harriers, the easiest and most impressive rolling harriers, and yet when you go to low rates, its capable of the most beautiful point rolls, and rolling circles. The ADXL is even capable of tricks like one roll circles and loops and beautiful slow rolls that you can take to the length of your flying field!

Engineered for precision flying, the ADXL is a very neutral airframe - you will find zero coupling and no mixing required for precision flying. No CG adjustment required for switching between precision and 3D flying either! The ADXL does beautiful fast knife edge circles, and even knife edge elevators and knife edge waterfalls! Things other planes are not capable of. The flight envelope will keep expanding as you get more and more familiar with the plane, and being a slow flying plane will make new manoeuvres easy to experiment and develop – which guarantees to improve your 3D and precision flying skills.

Addiction X ARF

www.Addiction3D.com

Wingspan: 1,270mm / 50 in
Length: 1,331mm / 52.4 in
Weight (including LiPo): ~1200g / 42.3oz
Wing area: 744 sq. inch
Wing loading: only 8.18oz/sq.ft!!

Motor: PA Thrust 40 outrunner
ESC: PA Quantum 45A ESC with SBEC
Propeller: VOX T-40X propeller
Battery: PA Lipo pack 11.1V 2200mAh
The Addiction X is a featherweight model that is incredibly stable, easy to fly and is capable of performing precision 3D maneuvers even in windy conditions. The combination of its extreme lightweight (low wing loading) and state-of-the-art aerodynamic design makes the Addiction-X fly slower than a turtle walking through peanut butter! (LOL). This gives the flyer ample time to think and act. Due to the huge control surfaces, the Addiction-X will respond immediately to your stick inputs, which is crucial when flying slow 3D. These factors make it perfect for learning 3D.

Ever dreamed of hovering in your first flight? – Now the dream can become a reality! Not only that - you'll be able to choose your spot and hover above it! Torque roll, reverse torque rolls and tightest waterfalls will all come naturally and it will land at less than walking pace!

Similar to the original Addiction, the Addiction-X harriers exceptionally well in both upright and inverted positions and is perfect to learn harrier figure eights and spot landings. Flat spins are exceptionally flat using only the rudder, meaning you can easily perform spins at any height.
The Addiction X is capable of doing the most amazing high alpha knife edge, and tightest knife edge loops you have ever seen in an airplane this size. The incredible rudder authority means zero coupling in KE so you could fly Knife Edge all day long just holding the rudder stick. You can change KE direction and even do knife edge waterfalls, all with ease.

The Addiction-X gains airspeed rapidly from stall position which allows awesome transitions between maneuvers that adds to the amazing 3D display. Unlike many other 3D models the Addiction-X is also surprisingly precise and tracks extremely well, even in windy conditions. It is sure to impress not only you but everyone else at the flying field.

Katana MX ARF

www.PAKatana.com

Wingspan: 57" /1448mm
Length: 56.34" /1431mm
Wing area: 749 sq. in
Motor: PA Thrust 50 outrunner
ESC: PA Quantum 70A ESC with SBEC
Propeller: VOX 15x8 propeller
Battery: 2x PA Lipo pack 11.1V 2200mAh

Back in the days, you had to choose: do you want an aggressive-flying plane (but be careful to fly it low and slow!) or a slow 3D flyer? Or perhaps you are after a precision flyer? Now, in this NEXT Generation – you can get it all in the one plane! The Katana MX is THE airplane of your dreams! IT WILL DO IT ALL - From precision to high energy to graceful slow and low 3d.. Find it hard to believe? You just gotta fly it

Being a NEXT Generation PA plane means the KMX sustains more energy when flown and by so keeping higher flight speeds which is vital when performing consecutive aerobatics or freestyle maneuvers and allowing sharp and quick turns, resulting in most impressive and breathtaking transitions. Yet, it can, JUST AS WELL, be flown like a big foamy when slow 3D and high AOA maneuvers are executed. Regardless of your piloting level, this plane will bring a smile to your face. If you are a beginner to intermediate looking for sport flying, or perhaps starting on 3D you'll be amazed at how forgiving this plane is when it comes to flying beyond the stall! While others would have stalled and eaten dirt you will still be happily flying.

Advance pilots will fall in love simply because of its exceptionally wide flight envelope – this plane opens up a whole new world of aerobatic maneuvers by combining 3d with precision aerobatics that will ultimately expand your flying skills.

Despite its wingspan being 1" smaller than the Extra MX, it is actually a much larger plane and has a look and feel of a large plane at the field. As any other PA model here too the two wings panels are removable with a CF wing tube and a CF sleeve. The KMX gives you "giant-scale" performance in a convenient and easily transportable package without ever worrying about storage space or vehicle size or having to drive for hours to get to a large enough flying field to fly.

Addiction ARF

www.Addiction3d.com

Wing span: 1000mm /39.5"
Length: 1063mm/ 41.85"
Weight: RTF approx 750g / 26.5oz
Wing Area: 485 sq.in
Wing Loading: 7.9oz/sq.ft
Motor: PA Thrust 20 outrunner
Servos: 4 micro servos 9g, 1.6kg/cm torque

Precision Aerobatics' mission is not only to produce better and better aircrafts. For us, it is just as important to assist and inspire our customers to become better and better flyers. How many times have you watched the videos on our website and thought "yeah right! Maybe when an expert is holding the sticks, but I'll never be able to do that!"
3D is challenging and is fun, and with the right aircraft it is within the grasp of anyone regardless of experience or skill level!

PA brings you a new aerodynamic design with a huge wing area of 485 sq.in and amazing flying weight of only 750g (26.5oz). The Addiction is predictable and stable, features exceptional stall and slow speed handling characteristics, quick recovery and robustness - **allowing any modeler to fly hardcore 3D with ease**, **inches off the ground.**

It is designed for 3D beginners; 3D addicts working to bring their skills to another level or any pilot who simply wants to have pure unadulterated fun.

Although the Addiction is a mid-sized aircraft (close to the physical dimensions of the Katana MD) it is designed to be powered by an economical lightweight 20 size **iPAs**-drive setup. This set up makes the Addiction extremely responsive providing absolute control, so you can get out of the most difficult situations with ease. You will be naturally flying much lower and more aggressively than ever before.

Ultimate AMR ARF

www.UltimateAMR.com

Coming soon!
AMR MX 52"

Wing span - 40 inch / 1014mm
Length - 43.08 inch / 1095mm
Wing area - 582.4 sq inch
Flight weight ~ 38.45oz / 1089gr
Wing loading - approx 9.5oz sq ft!!
Motor: PA Thrust 40
ESC: PA Quantum 45A
Servos: 4 Micro servos 1.6kg/cm torque

Forget what you have heard about bipes..Hard to handle? Stalls easily? a handful to land? well CERTAINLY NOT WITH THIS ONE. Many months of design, testing and experimentation brought about this exceptional model.

The new Ultimate AMR features the revolutionary FiberFusion® construction making it the lightest electric built up Biplane produced to date in this size – about 38.45oz ready to fly (!!!) yet is rigid enough to withstand the most extreme high energy maneuvers we know you will be tempted to try!

The Ultimate AMR is easily transportable and will fit in any backseat of a car without the hassle of removing the wings. The wings are still removable for convenience of storage if desired.

The combination of the AMR unique design, exclusively designed airfoil, and our new Thrust 40 motor gives the feel of flying on a 4S pack with unlimited vertical performance although it is only using 3S 2200mAh 20c Lipo pack, without making any compromises on any maneuver or on flight duration and without having to make a costly investment in expensive battery packs essential on other heavier biplanes!

We assemble each airframe before shipping to ensure wing incidence, alignment and fit. All you need to do is bolt on the wings. The ailerons (as well as the stab/elevators) are already pre-hinged with the gaps sealed and as such assembling the wing is quick and easy.

Although the Ultimate AMR is an unlimited 3D/Freestyle beast, switching the dual rates onto low rates sets it's personality to smooth, precision IMAC or sports style flying you would get the distinct impression that it's flying on rails. Rolls are axial, well balanced and could be easily performed slow and persistent. Long fast turns are very accurate and without adverse yaw or loss of attitude and beautiful straight lines. Four point rolls and eight point rolls are simply beautiful.

Extra 260 ARF

www.Extra260.com

Wing span: 1219mm /48"
Length:1094mm /43"
Wing area: 490 sq.in
Flight weight: approx 955gr/33.7oz
Wing loading: approx 9.9oz/sq.ft
Motor: PA Thrust 30
ESC: PA Quantum 40
Servos: 4 Micro servos 1.6kg/cm torque

The Extra 260 excels in all tumbling maneuvers. Violent walls, violent snaps, spins (representative of full-scale aircraft) are just some of the high-speed, high-energy maneuvers the Extra 260 is capable of performing. On the post-stall extreme freestyle end, the Extra 260 is fully capable of executing one of the best, well balanced rolling harriers (extremely slow and persistent), slow stable harriers (both upright and inverted) with absolutely no wing rock. Extremely stable elevators (allowing long elevators all the way down to a spot landing), tight and stable harrier turns.

Transitions into high Alpha are extremely smooth and stable. The 260 also Knife Edges with the accuracy to perform KE circuits adds a further dimension of precision to the overall flight performance. In a nutshell this is the Extra with THE ALL THE EXTRAS thrown in!

XR-61 ARF

www.PA-XR.com

Also available in 52"

Wing span: 61" /1550mm
Length: 57" /1447mm
Flying weight: (AUW including batteries & spinner): approx 2028g / 71.5oz /4.47 lbs !!!!
Wing area: 807 sq. in !!!
Wing loading: 12.76oz/sq.ft
Motor: PA Thrust 50 outrunner motor
ESC: PA Quantum 70A Pro ESC
Battery: Two PA V3 LiPo pack 11.1V 2200mAh (or a 6S 2,200mAh pack)
Servos: Four Hitec HS-5245MG Mini digital servos
Prop: VOX 15x8 / 16x6 wooden propeller

Get ready for a new experience at the flying field: feel connected. If you love our Katana MX, or the XR-52 - you really need to fly this one - the XR-61 takes the best of both. It is the largest plane currently available in the PA line and is the most accurate in the PA range.

The sophisticated aerodynamic design, straight and true factory-build (incidence pre-set) and incredibly powerful set up allowing this plane to perform just like you hope for. Be it precision flying or slow 3D - you got it!

Don't be intimidated by the size or capabilities of this bird - the unique design makes it that it can be flown just like an accurate sport plane - relaxing to fly and easy to land. Switch to high rates and adjust your CG for entirely different flying characteristics.

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)