EXTRA 330 LX 120cc & 70cc

Build Guide

PERFORMANCE AIRCRAFT UNLIMITED

BY RC Gadgetz

Congratulations!

Thank you for purchasing the Performance Aircraft Unlimited 120cc Extra 330 LX. Extra 330 LX was designed and developed to be the best aerobatic aircraft in the world and it delivered! The PAU EXTRA is designed with 1897 sq inches of wing area while keeping the total weight down has made this aircraft a true performer. All wood and carbon construction and top quality hardware make it hard to beat. If you want an aircraft precise enough to compete in IMAC or to turn it loose for the wildest 3D maneuvers on the planet, the PAU Extra 330LX is the only choice.

We believe you will find this to be one of the finest flying aircraft on the market. Most modelers will find assembly of this aircraft simple and straightforward. This guide is meant to help experienced builders and modelers assemble this aircraft.
Please familiarize yourself with this guide before assembly.

Please take a few moments to read this guide before beginning assembly.

This is a model aircraft and not a ***TOY***. Serious injury, destruction of property, or even death may result from the misuse of this model. ***PAU Models*** is providing you, the consumer with a very high-quality model aircraft component kit, from which you, the consumer, will assemble a flying model. We can't inspect every finished aircraft you build. PAU Models is not responsible for any damage caused by using this product.
If you are not willing to accept ALL liability for the use of this product, please return it to the place of purchase immediately.

This model kit requires building experience.
This manual is a guide.
There are many ways to build this aircraft.

Aircraft Features:

- Laminated Carbon Fiber wood throughout the Fuselage
- Plug-in, Built-up wings with carbon reinforcements
- Plug-in stabs with servo mounting in stab
- Built-up fuselage
- EZ Quick release for all removable parts
  - Wings
  - Stab
  - Canopy
- High-quality instrument panel
- Genuine Ultracote covering
- Laser-cut balsa and ply
- Interlocking construction
- Canister and Pipe tunnel
  - (2) x 1.75/1.5" single arms for elevators (INCLUDED)
  - (1) x 1.75/1.5" single arms for rudder (only needed for push/pull setup INCLUDED)
- Included Aluminum Servo Arms
  - (4) x 1.75/1.5" single arms for ailerons (INCLUDED)

Carbon fiber wing and stab tubes

- Carbon fiber landing gear
- Pre-hinged surfaces
- Pre-sealed hinge gaps
- Pre-installed connectors
  - For Wings and Stab
- Pre-installed servo extensions
- Rubber grommet for fuel tubing
- Removable rudder
- All servo mounting screws are pre-drilled
- Titanium pushrods
- Two Piece fiberglass cowl
- Fiber Glass wheel pants.
- High-Quality Carbon / Aluminum tail assembly
- High-Quality Carbon Fiber spinner (INCLUDED)
- Carbon Fiber Wing and Stab Tube

Additional items needed to complete this aircraft, that are not included in this kit:

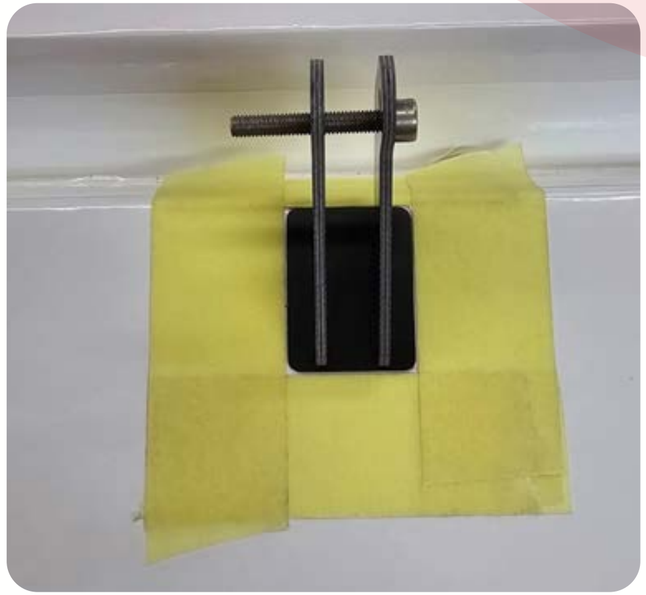
- An engine, within the recommend range, and propeller
- 8 channel computer radio and receiver recommended
- Batteries
- Four aileron servos rated at least at 30kg of torque
- Two elevator servos rated at least at 38kg of torque each!
- One or two rudder servo rated at least at 43kg of torque
- One throttle servo
- 1m to 1.5m of fuel tubing
- Foam rubber
- 30 to 45 minute epoxy
- A bottle of thin CA
- Covering iron
- Various modeling tools for assembly
- Masking tape

A few tips to ensure success

- Our prototypes has successfully completed rigorous testing, even with maneuvers that would be dangerous for most aircraft. However, we can't inspect every part of the plane. To strengthen the aircraft, we suggest applying a CA to areas that experience high stress, like the aileron control mounts, landing gear attachments, and wing supports.
- Professionals utilizing premium Ultracote covering carefully covered your model. Due to climate changes during shipping, the models covering may have loosened and/or winkled. It’s a good habit to go over your model with a covering iron to ensure all joints, seams, and edges are properly sealed.
- Buy the best servos you can afford! Your aircraft is equipped with very large control surfaces that deflect well over 45 degrees. A lot of servo power is required to prevent flutter and to maintain the required deflection for maneuvers.
- Use a high-quality epoxy for installing the composite control horns and hinges. We highly recommend the use of Pacer Z-Poxy 30-minute formula.
- The aircraft is built using very modern construction techniques and is very light weight for its size. As with any high-performance machine, regular inspection and maintenance is a must. While disassembling your aircraft after a flying, pay close attention and check glue joints, linkages and loose covering to be sure the airframe is sound.
- A drop of blue Loctite will go a long way, make sure to apply some on the screws to avoid them coming lose.
- All surfaces have been glued and sealed in the factory, to insure that they are glued properly, tug on each surface. If any of the surfaces come loose, use a syringe and inject epoxy in the hinge that requires it.

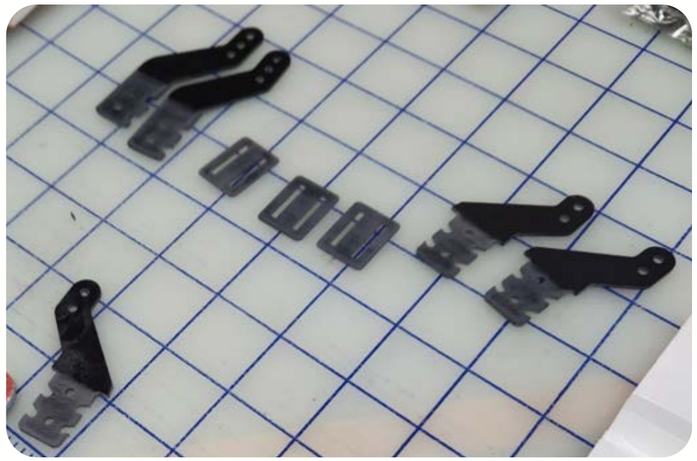
Control Horns Installation

Please note for all control surfaces the following steps will apply (Elevators, Ailerons and Rudder).



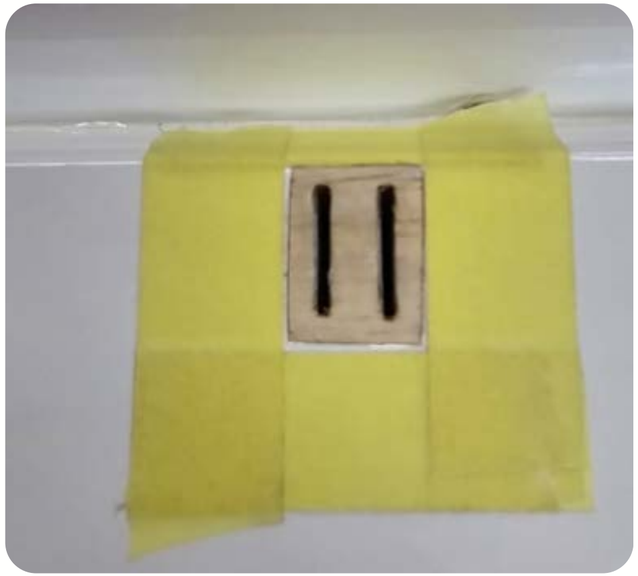
Step 1:

Sand the control horn area that will get glued in the surface.



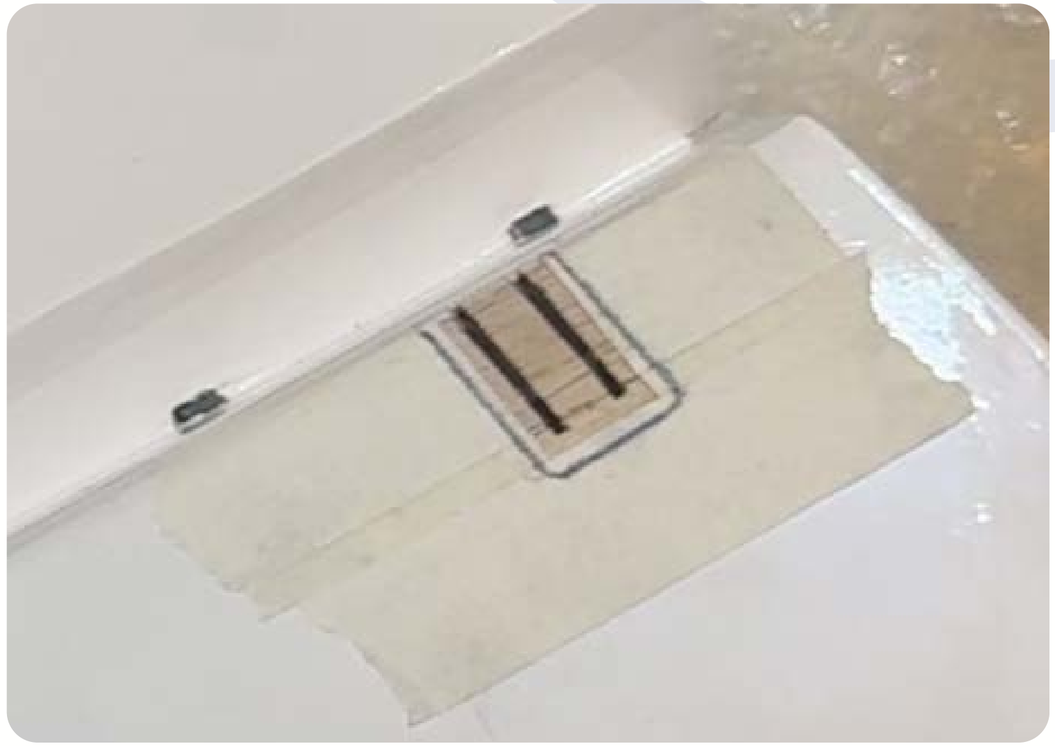
Step 2:

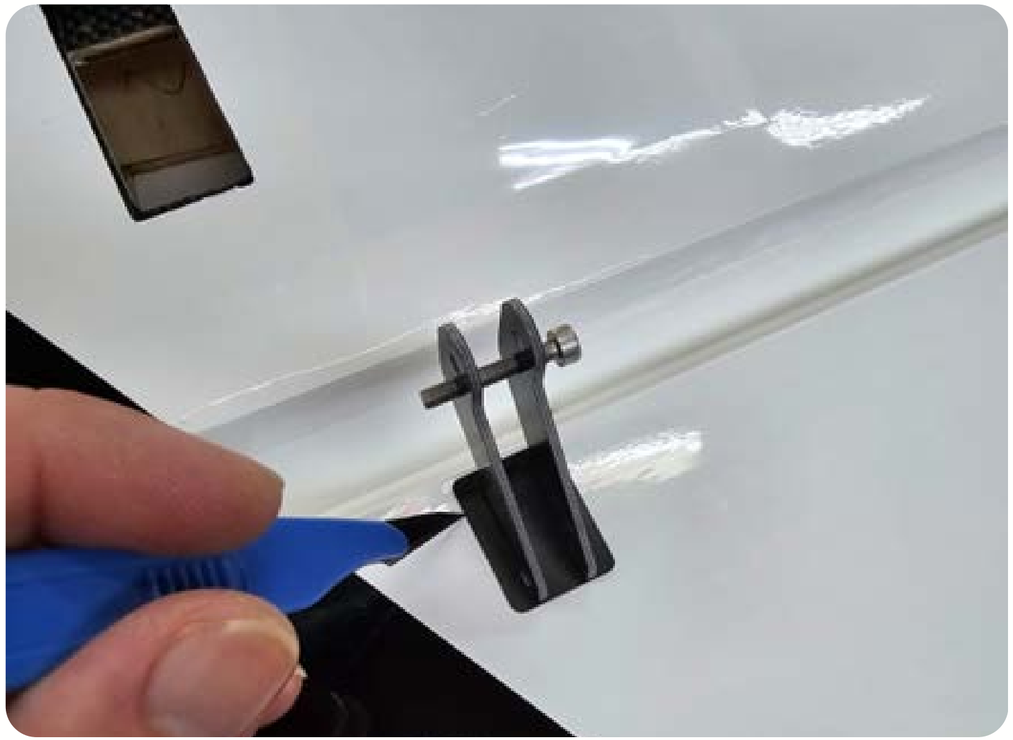
Insert the 2 control horns into the base plate and trial fit the horns into their slots and make sure they seat properly against the base plate and elevator surface. Place masking tape around the control horn. Trace around the base plate with a fine tipped felt marker or pencil.



Step 3:

Remove the horn assembly and use your #11 blade to remove the covering from inside the ink line you traced around the control horn base. Wipe away the ink line with a paper towel soaked in denatured alcohol if you didnt use the masking tape.





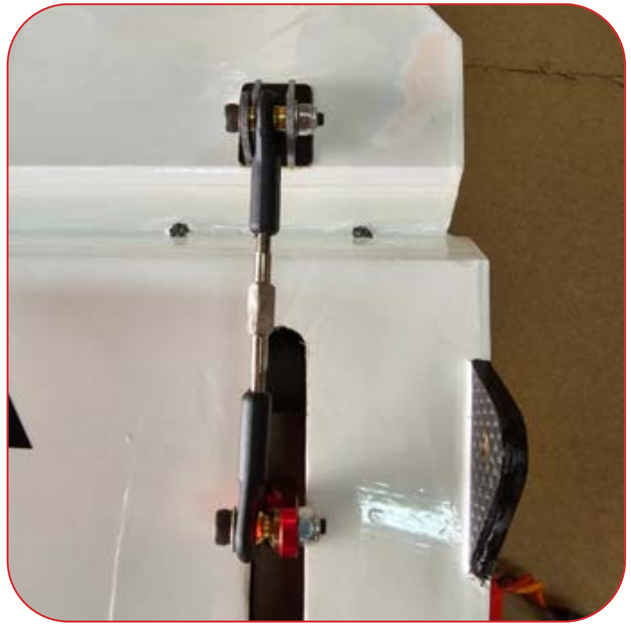
Apply 30 minute epoxy to the slots and thoroughly coat the horns and base plate bottom. Reinsert the assembly into the slots and wipe away any excess epoxy with a paper towel and alcohol. Place a 3mm bolt through the horns to help ensure proper alignment and set aside to dry.

Elevator Servo Installation

Step 1:
Use your hobby knife to remove the covering from the slot in the bottom of the stab for the elevator servo horn.

Step 2:
Install the elevator servo inside the stab using the manufacturer supplied mounting hardware with the output shaft toward the Front of the stab. It will be easier to electronically center the servo and confirm proper servo arm installation before screwing the servo into position, although you will still need to remove the arm to install the servo.

Step 3:
Locate 2 ball links and a titanium turnbuckle pushrod. Thread the ball links onto the pushrod and install using the supplied 3mm bolts, nuts and washers as shown in the picture. You may find it necessary to enlarge the slot in the bottom of the stab to allow for maximum travel, when the servos are installed and it is time to tighten every screw and nut make sure to use a drop of BLUE Loctite. repeat for the other elevator.



Wing Assembly

Step 1:

Locate the aileron servo mounts and remove the covering from this area using a hobby knife. Use a sealing iron to seal the edges of the covering to the sides of the servo opening.

Step 2:

Use the manufacturer supplied servo extensions and mounting hardware to install the servos with the output shaft toward the aileron. Electronically center your servos to make sure both servos work is moving in the same direction.

Thread 2 ball links onto each turnbuckle pushrod. Secure the pushrod to the control horns and servo arm as shown in the picture using the supplied 3mm bolts and nylon insert locknuts. Use BLUE Loctite.

Landing Gear Installation

Step 1:

Ready the carbon fiber main landing gear, 4pcs of the 4mm bolts, washers. Insert the gear into the slot on the bottom of the fuselage and center it in the slot. Secure the landing gear with 4mm bolts and washers by inserting the bolts and washers into the pre-drilled holes in the aluminum gear mounts inside the fuselage. There will b e a blind nut installed, thread the screws in. Use BLUE Loctite

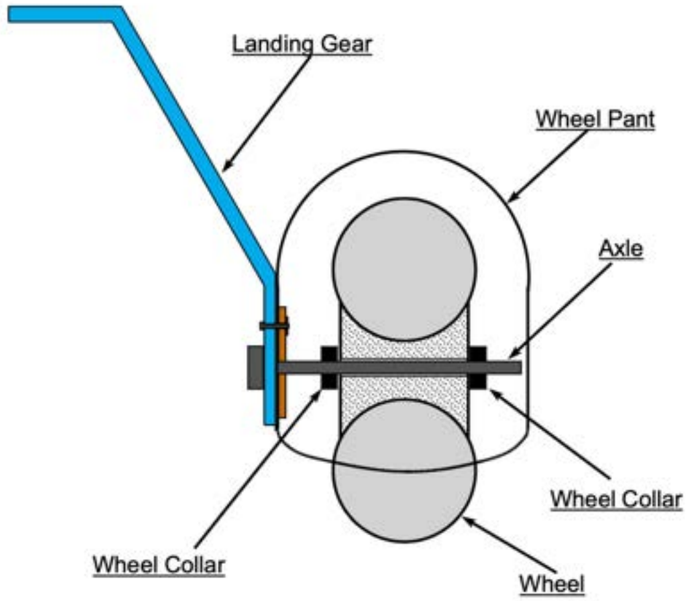
Step 2:

Use 2 small screws to secure the provided landing gear fairings in place. You will need to drill a small pilot hole to be able to thread the screw into the carbon.

Alternative method is to use clear silicon, from the inside of the wheel fairings.

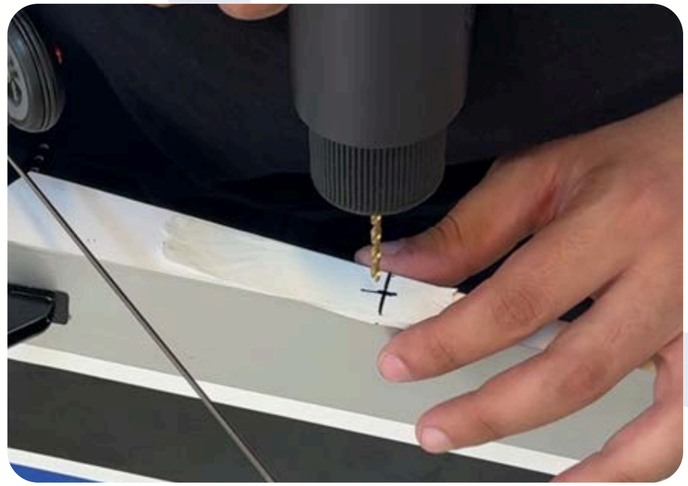
Step 3:

Ready the 2 axles, 2 locking nuts, 2 wheels, 4 wheel-collars and 2 wheel-pants from the hardware package. Place the wheel onto the axle and secure with 2 wheel-collars. Place the threaded portion of the axle through the hole in the landing gear, place a washer onto the axle and secure the axle with a locking nut. You might need to enlarge the area where the nut sits, use a Dremel with a sanding drum and slowly enlarge the hole until the gear assembly sits nice and snug with the wheel pants.



Step 4:

To install the Tailwheel assembly. Drill a hole in the bottom of the rudder to fit the shank of the included 2mm ball link between 10-13cm from the rudder hinge line.



Step 5:

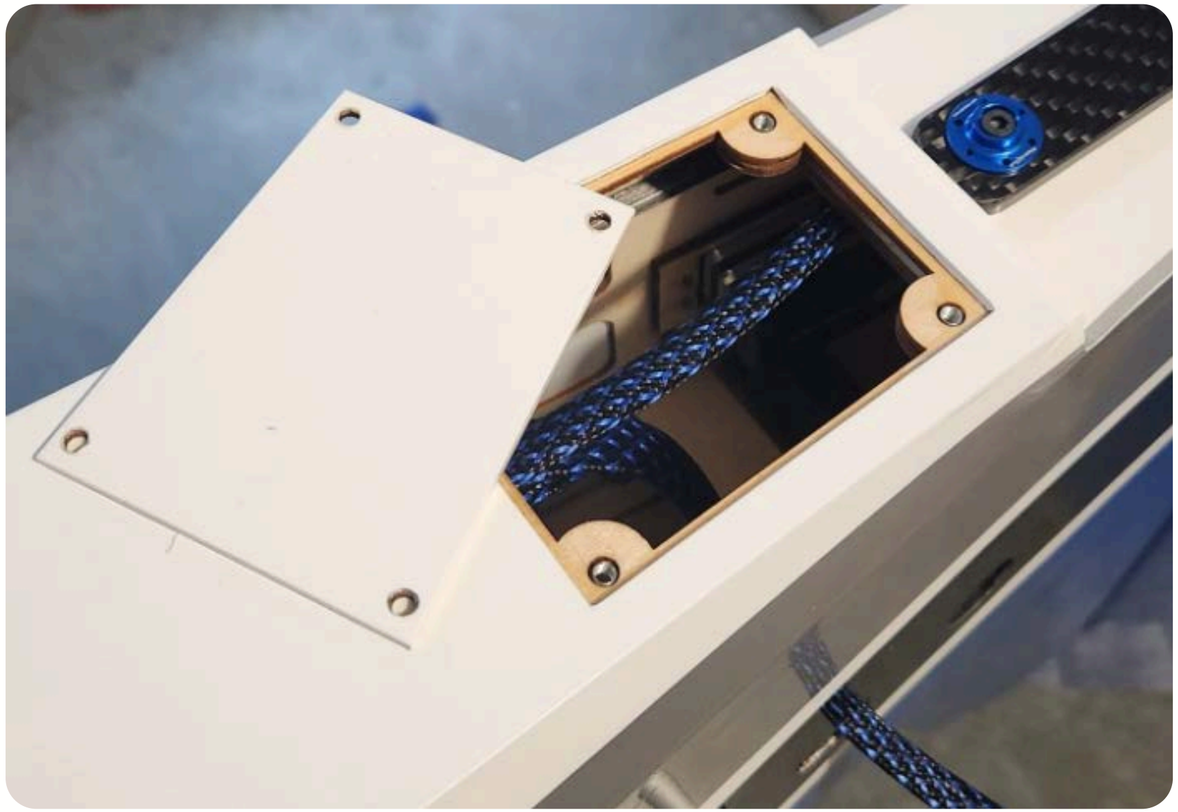
Glue the ball link provided into the bottom of the rudder using epoxy.

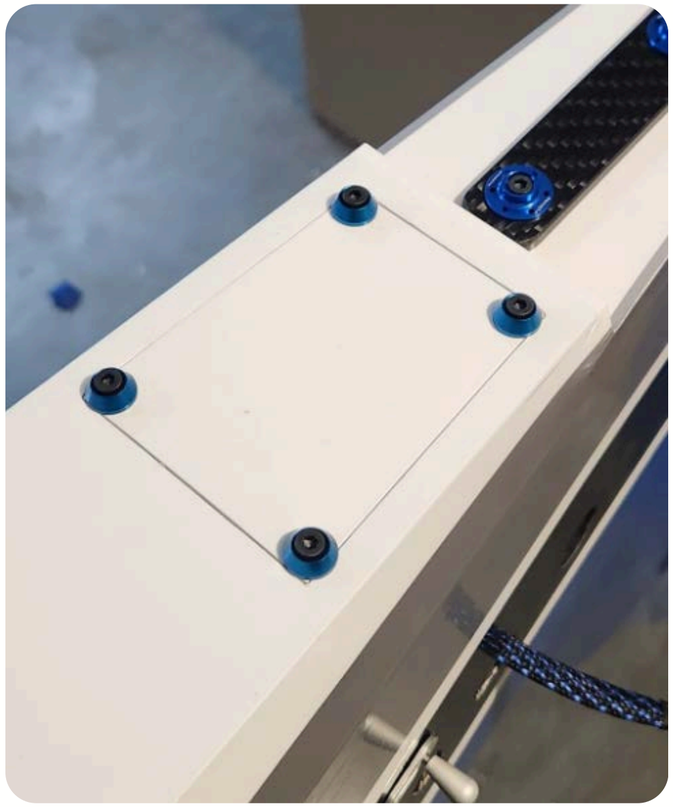
Step 6:

Slide the tiller arm into the ball link and secure the tailwheel assembly to the rear bottom of the fuselage with the supplied 3mm bolts inserted through the carbon tailwheel assembly and into the pre-installed blind nuts in the bottom of the fuselage. The tiller arm will require some bending to be able to get it to align correctly to the hole of the ball link. Use a vice and slowly bend the willer arm until you get the correct alignment.

Step 7:

You will find in the tail of the aircraft a hatch that will give you access to the quick release as well as if you need to do some cable management.
Use a hobby knife to open the hatch and make sure you use a covering iron to seal the covering before screwing the hatch.

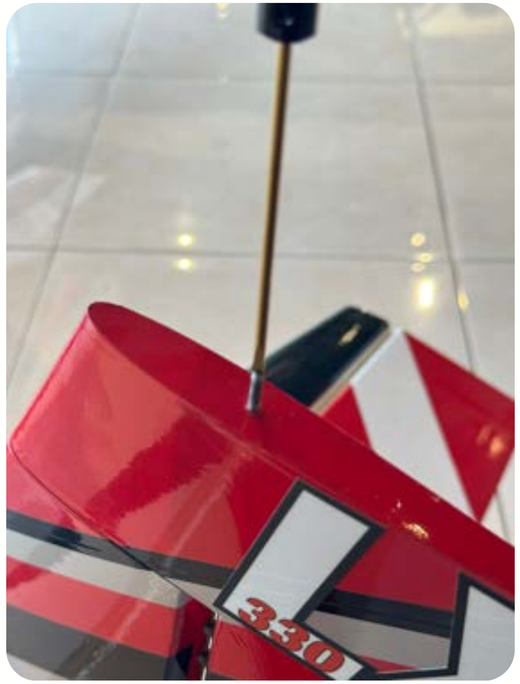




Rudder Servo Installation & Set up

Step 1:

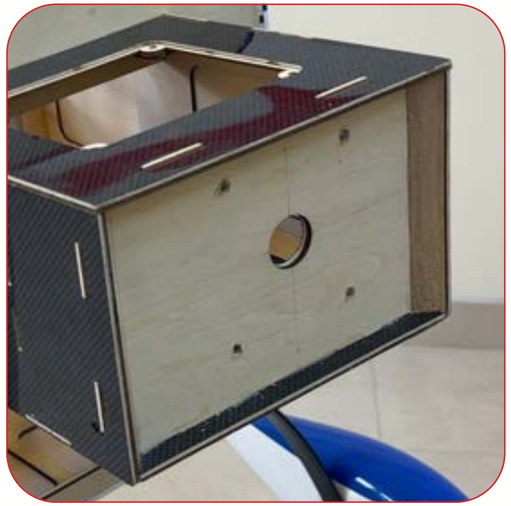
For best performance we use Push-Pull set up for rudder install. Install the servo in the opening at the rear of the fuselage with the output shaft toward the rear of the plane. You will need to attach a 120cm servo lead to reach the radio compartment. You will want to use the most powerful standard size metal gear servo and a 2” servo arm. Thread a ball link onto each end of the provided turnbuckle pushrod and install it as you have for the elevators and ailerons.



Step 2:

You will find that the rudder has a removable hinge. A the end of the hinge there will be a flat head screw, this is used to secure the hinge in place without it coming off while flying. Make sure that you screw the hinge in place when you are about to fly. What we like to do, is install the hinge and put clear tape over it to make sure it is not going anywhere.

Engine Installation:



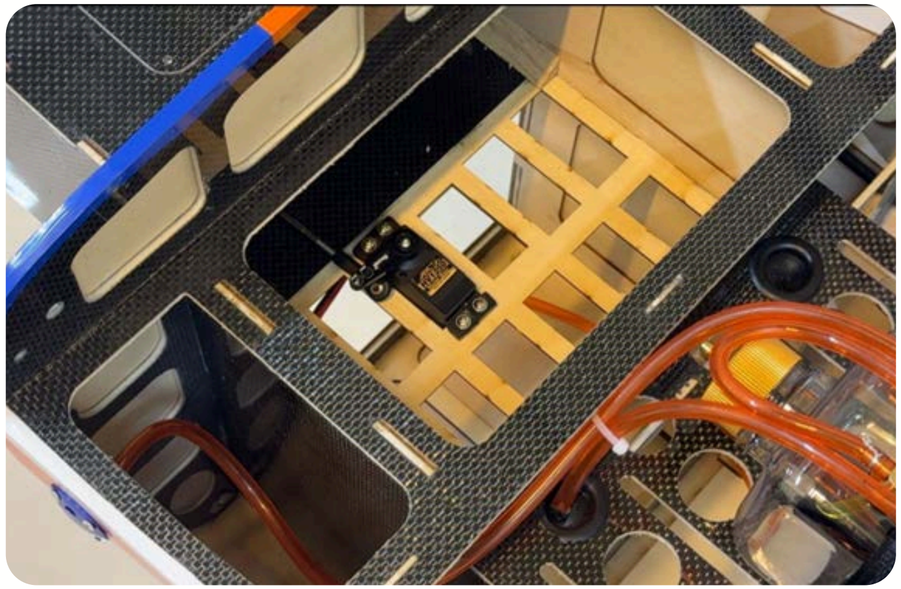
Step 1:

The center marks have been scribed into the front of the firewall with a laser. If using the DA 120 simply drill the firewall at the location laser scribed on the firewall. If using another engine make download the template for the engine and tape it onto the front of the firewall making sure to align the horizontal and vertical lines on the template with the laser scribed lines on the firewall. Use the supplied stand-offs, this will ensure that your DA 120 is perfectly spaced and that there will be no rubbing from the back plate of the spinner and the cowl. Once you have completed the engine install and have installed the throttle servo. Make sure to use blue thread lock and tighen the engine.

Throttle Servo and Fuel Tank Installation

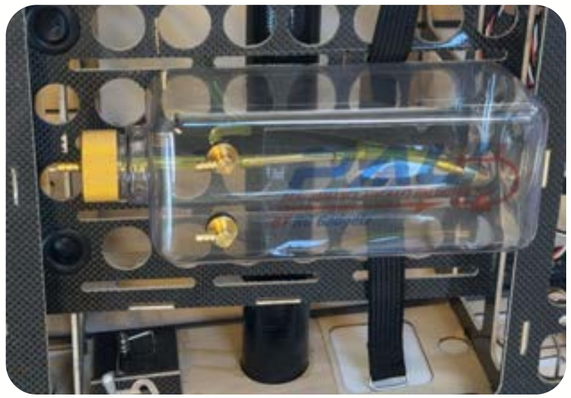
Step 1:

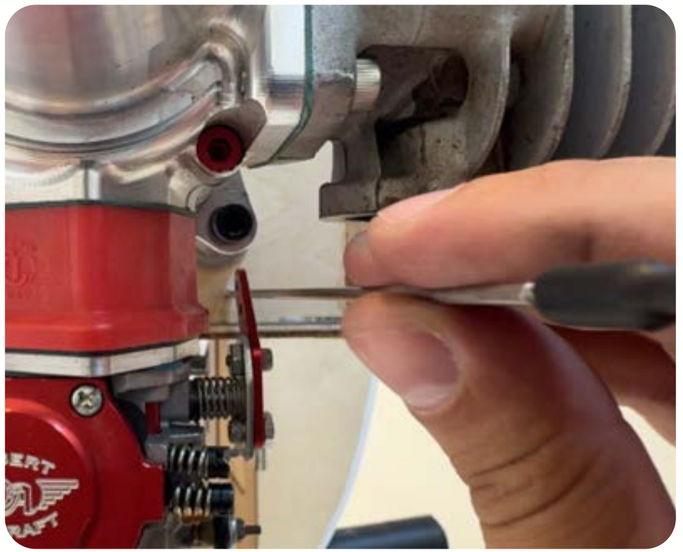
There is a location pre-cut for a throttle servo in front of the fuel tank platform. This will work for some engines but others may require a different mounting location. You will need to fabricate your own linkage to accommodate your choice of engine. To have the best geometry for the throttle servo, you will need to drill a hole in the firewall under the right bottom mounting screw for the engine (see picture for reference). After drilling, mount the throttle pushrod and make sure that the servo moves the entire range without any binding, if there is binding, expand the hole accordingly.

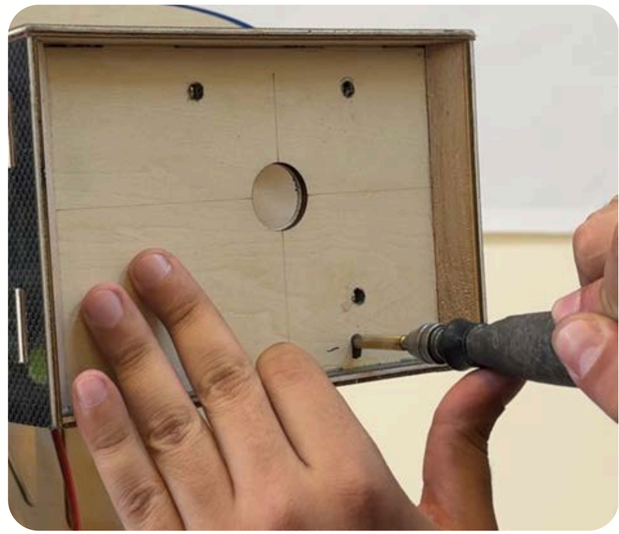


Step 2:

Install the tank on the fuel tank platform, make sure that you clean the surface before you stick the Velcro strip on the platform. Install the fuel tubing and route the tubing to the enigne.







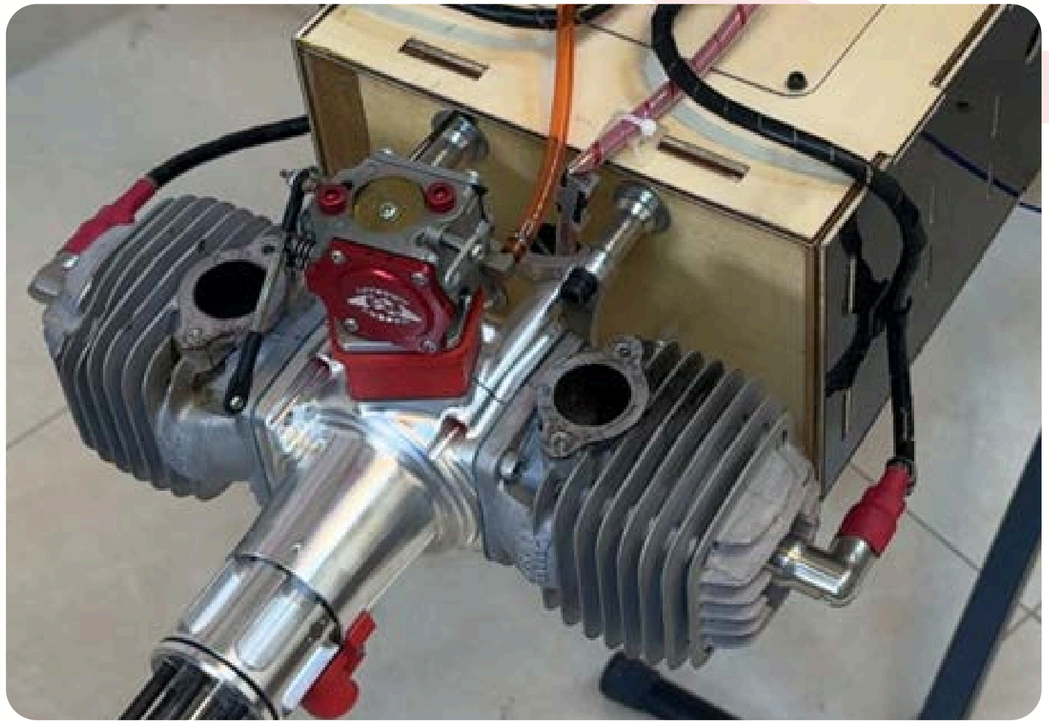
Throttle Servo and Fuel Tank Installation

Step 3:

Route your tubing to the provided fuel dot and fuel vent. You will find ready made holes that are designed for the fuel dot and fuel vent.

Step 3:

Once you are done with your throttle linkage, tank, plumbing and ignition installation it is time to mount the cowl. First install the engine box cover with 4 screws. Next cut the cowl to clear the mufflers and make an air exit.



Step 4:

You will find baffles included in your kit, trim the baffles so that they fit very close to the cylinder to be able to get the best airflow possible to be able to cool the engine down.

Step 5:

Install both halves of the cowl, using the provided screws and washers.

Step 6:

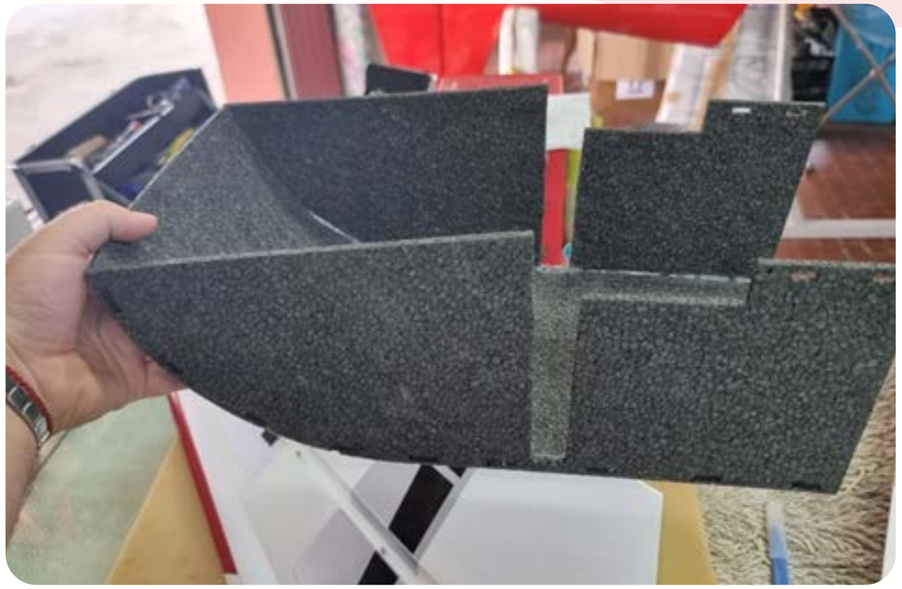
Install your choice of prop and the provided spinner.

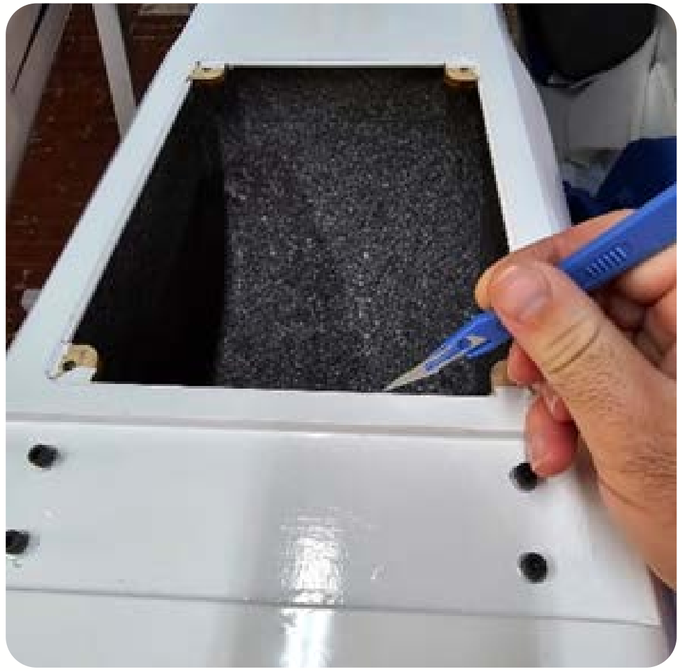
Step 7:

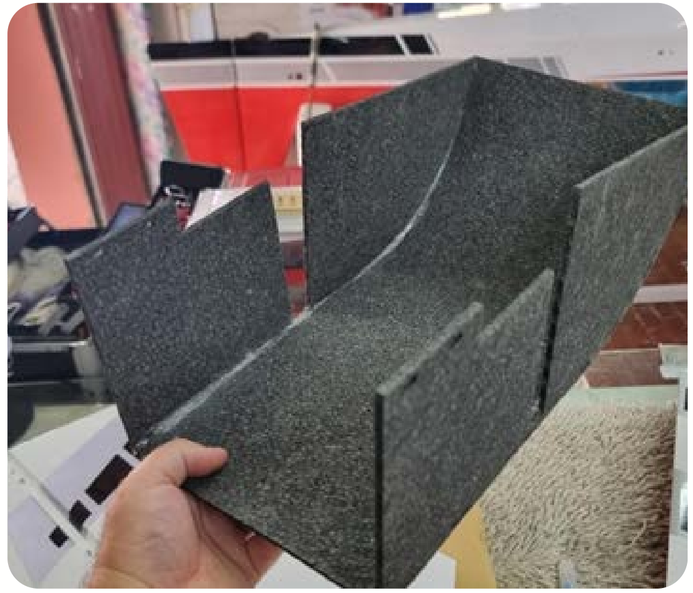
Install your switches, batteries and receiver. Choose the locations to mount your batteries to help achieve correct center of gravity.

Pipe or Canister Installation Hints

If you wish to install a tuned exhaust or canister muffler system in your aircraft. We have built a pipe tunnel into the bottom of your aircraft to make this a relatively easy task. Some of the advantages of using a tuned exhaust are an increase in power and a reduction in engine noise. There are many makes of tuned exhaust systems available for 100-120cc engines. For the DA-100 and 120 you will need to purchase a header with a 110mm drop. You will also need to purchase a Teflon coupler set and spring clamps along with mounts







EZ-Quick Release

The PAU Extra 330LX is eqiuiped with a EZ- Quick Release system, that makes assembly at the field very quick.
Make sure that the the lock is in the open position, slide your wing into the fuse and lock it in place. there are 2 EZ quick release systems per wing.
You will also find a wing bolt that can be installed for added security . We have done all our flight testing with only the EZ-Quick release system and it wokred flawlessly

To lock the elevator in place just move the EZ-Quick release pin forward, slide the elevator in place and release the pin. make sure you give the elevator a tug to make sure the system is in the locked position.
You will find that there is a blind nut already installed in the rear of the fuse for the elevator should you want to use a screw to secure your elevator. We provide both options so you have the freedom to choose what best suits you.
Note: if the lock is not sitting correctly in the grove you might need to add a thin washer to correctly align it so it can lock correctly.

Canopy

You will find a beautiful canopy that comes with the aircraft complete with the instrument panel and pilot figure. To lock the canopy in place, make sure that the quick release is in the open position, slide your canopy in place and lock the canopy. it is very straight forward.

Set-up and Trimming

To check the Center of Gravity of your aircraft, loop a rope around the wing tube then attach the wings and then lift the plane using a rope looped around the wing tube. The plane should balance horizontally.
Adjust the position of your batteries and radio equipment to achieve this.

The following control surface travels are what we recommend as starting points.

Elevator: 15-20 degrees low rate, 20-30% exponential
45 degrees for high rate, 50-60% exponential

Aileron: 20 degrees low rate, 30-40% exponential
37 degrees up and 36-35 degrees down for high rates, 50-60% exponential

Rudder: 20 degrees low rate, 50% exponential
45 degrees for high rate, 60-70% exponential.

Fly and test the aircraft.
Make sure you fine tune accordingly to what makes you comfortable.

Thank you!

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