Instruction Manual

ARF

120cc EDGE 540

FLEX INNOVATIONS™

BEFORE CONTINUING WITH THIS INSTRUCTION MANUAL OR THE ASSEMBLY OF YOUR AIRCRAFT, PLEASE VISIT OUR WIKI SUPPORT SITE FOR THE LATEST PRODUCT UPDATES, FEATURE CHANGES AND MANUAL ADDENDUMS FOR THIS PRODUCT.

wiki.flexinnovations.com/wiki/Edge540-120cc

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INTRODUCTION

From the Designer:

To me, the Edge 540 has always been one of the most iconic aerobatic airplanes of all time. I've always loved the appearance of the original Edge 540 from the early 90's, and I've always wanted something in this class that shared that same full-scale-like appearance, but without sacrificing performance. Too many airplanes today rarely look the part.

The Edge 540 120cc is an airplane you can quickly get comfortable with, and easily start to find its true performance. I've found the Edge is a stable and predictable machine in all aspects of flight, particularly in high-alpha and knife edge flight where it has more than enough yaw authority to do anything you want. Precision flight is also phenomenal, with clean snaps and great tracking.

Overall, I'm extremely pleased with the performance we've been able to get out of the Edge and can't wait for you to get yours in the air and experience it for yourself. Thanks for purchasing the Edge 540 120cc, and I hope you enjoy flying it as much as I do!

Seth Arnold

REFERENCE MATERIAL

SPECIFICATIONS:

Wingspan:	104 in. (2642mm)
Length:	102.2 in (2595mm)
Estimated Weight: (DA-120 w/standard muffler)	27.75 lbs (12.59kg)
Engine Size:	100-125cc

REQUIRED EQUIPMENT:

Radio Equipment & Servos:

Transmitter:	8+ channels
Receiver:	8+ channels, high-voltage capable
Receiver Battery:	(2) 2S 2000mAh 15C+ LiPos (FPZBR20002S15 recommended)
Recommended Servos:	(7) Minimum 450 oz/in (32.4 kg/cm) for control surfaces & (1) standard servo for throttle.
	(8) Potenza DS49010BLHV Servos recommended (FPZDS49010BLHV)

Servo Arms:

Aileron, Elevator & Rudder:	(7) 2-inch Single Arm (Push-Pull Rudder)
	Potenza 2-inch Clamping Servo Arm (FPZA1036) recommended

Servo Extensions:

Ailerons:	Root Servo (Inside Wing) – None Required
	Tip Servo (Inside Wing) – (2) 12-inch (305mm)
	All Aileron Servos (Inside Fuselage) (4) 12-inch (305 mm)
Elevators:	(2) 48-inch (1200 mm)
Rudder:	Tail-Mounted Push-Pull - (1) 36-inch (915 mm)
	Forward-Mounted Pull-Pull – None Required
Throttle:	(1) 18-inch (457mm)

Spinner:

Spinner:	5-inch (127 mm)
	Flex Innovations 5-Inch Carbon Fiber, Ultimate Style Spinner Recommended (FPMA1024A & FPMA1024B)

Gas Engine Setup

Engine:	100-125cc Two-Stroke Engine Desert Aircraft DA-120 recommended
Exhaust:	Follow your engine manufacturer's recommendation, as well as local noise restrictions in your area.
	Desert Aircraft Stock Muffler Set (FPMDA120MUFFLER) recommended
Other Exhaust Options:	KS 3086 Canisters (Rear Exit)
	90mm drop flexible header for the DA-120
Propeller:	Follow your engine manufacturer's recommendation.
	Falcon 28 x 9.5 recommended for the DA-120 on stock mufflers
Engine Standoffs:	(4) 20 mm Aluminum Engine Standoffs
	FPM1624 recommended
Ignition Regulator:	Follow your engine manufacturer's recommendation
Ignition Battery	2S 2000mAh 15C+ Li-Po
	Potenza 2S 2000mAh 15C Li-Po (FPZBR20002S15) recommended
Fuel Dot:	McFueler Fuel Dot (FPMAMCFUELER)

Optional Equipment:

FPZAURA08PRO	Aura 8 Professional
FPM1623	32oz Lightweight Fuel/Smoke Tank (for smoke)
FPMHOLYG2	Holy Smokes G2 Smoke System
FPM1314	Flex Innovations Premium Wing and Tail Bag Set
FPM1327A/B	Edge 540 120cc Pilot and Cockpit Set
ISDTD2	ISDT D2 Dual Port AC 200W Charger
FPM1315A/B	Premium Vinyl Graphics Set Edge 540 120cc

ULTRACOTE®/ORACOVER® COLORS:

Green Scheme:

Ultracote®

Unavailable, buy Flex part #FPM1316

White (HANU870)

Black (HANU874)

SIlver (HANU881)

Oracover®

Royal Green (28-042)

Sky Blue (21-010)

Orange 21-071

Silver 21-091

Red Scheme:

Ultracote®

True Red (HANU866)

Midnight Blue (HANU855)

White (HANU870)

SIlver (HANU881)

Oracover®

Ferrari Red (21-023)

Dark Blue (21-052)

White (21-010)

Silver (21-091)

USING THIS MANUAL

The manual is divided into sections to make the assembly of the airplane easier to follow.

Note: The squares "☐" next to each step that can be checked off to help you keep track of the steps that have been completed.

ATTENTION

Read the ENTIRE instruction manual to become familiar with the features and assembly of the product before starting assembly. Failure to assemble or operate the product correctly can result in damage to the product, personal property and cause serious or fatal injury.

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Flex Innovations, LLC. For up-to-date product literature, please visit our website at www.flexinnovations.com and navigate to the product page for this product.

WARNING

This is NOT a toy. This product is not intended for use by children under 14 years of age without direct adult supervision.

IMPORTANT INFORMATION REGARDING WARRANTY

Please read our Warranty and Liability section before building this product. If you as the purchaser or user are not prepared to accept the liability associated with the use of this product, you are advised to return this product immediately in new and unused condition, in the original packaging material, to the place of purchase.

SAFETY WARNINGS AND PRECAUTIONS

Protect yourself and others by following these basic safety guidelines.

1. This manual contains instructions for safety, operation, and maintenance. It is essential to read and follow all the instructions in the manual, prior to assembly, setup, or use, in order to operate correctly and avoid damage or serious injury.
2. In some cases, the written instructions may differ slightly from the photos. In those instances, the written instructions should be considered correct.
3. This model is not a toy, rather it is a sophisticated remote control hobby product and must be operated with caution and common sense. This product requires some basic mechanical ability. Failure to operate this product in a safe and responsible manner could result in injury, or damage to the product, or other property.
4. This model must be assembled according to these instructions. Do not alter or modify the model outside of these instructions provided by Flex Innovations, LLC, as doing so may

render it unsafe and/or unflyable. You must take time to build straight, true, and strong. It is your responsibility to ensure the air worthiness of this product.

5. Use only compatible, appropriate components for the final assembly of this model. Ensure that the radio system is in functional condition, that the engine is appropriately sized for the model and that all other components are appropriate for use in this model as specified in this instruction manual. All components must be installed correctly so that they operate correctly both on the ground and in the air.

6. Inspect and check the operation of the model and all its components before every flight.

7. If you are not an experienced pilot, or have not flown a high-performance model before, it is recommended that you seek assistance from an experienced pilot in your R/C club for your first flights. If you're not a member of a club, the Academy of Model Aeronautics (AMA) has information about clubs in your area whose membership includes experienced pilots.

8. Keep the propeller area clear from such items as loose clothing, jewelry, long hair, or tools, as they can become entangled. Keep your hands and body parts away from the propeller as injury can occur.

SPECIAL LANGUAGE DEFINITIONS

The following terms are used throughout the product literature to indicate various levels of potential harm when operating the product.

NOTICE: Procedures, which if not properly followed, create a possibility of physical property damage AND a liable or no possibility of injury.

CAUTION: Procedures, which if not properly followed, create a probability of physical property damage AND a possibility of serious injury.

WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage and serious injury OR create a high probability of serious injury.

IMPORTANT BEFORE ASSEMBLY

Carefully unpack your aircraft and inspect the parts. Review the manual and gather the required tools and supplies.

o Remove all parts from their plastic bags, inventory all items and closely examine all the major airframe components for damage. If any items are missing or you find damaged components, do not proceed. Please contact customer support.

o Use a covering iron with a covering sock on high heat to tighten the covering as necessary, paying special attention to the leading edges of the flying surfaces, hinge lines and stabilizer and wing saddle areas. Apply slight pressure over sheeted areas to thoroughly bond the covering to the wood. Use caution around seams to prevent inadvertently pulling them loose.

  o **Pro-Tip:** You can use a "Seal-It Pen" or clear nail polish to permanently seal any sharp edges or corners of covering that may come loose in flight.

o Use thin CA to go over any important glue joints, such as the motor box, firewall, servo mounting rails and any other pre-assembled joints that may see high stress during flight.

o Gather all the required components such as motor and radio equipment that will be used to equip the airplane. Create a new radio program in your transmitter and bind this model program to the receiver that will be used in the airplane

AILERON & ELEVATOR CONTROL HORN INSTALLATION

Required for this section

Components	Tools	Adhesives/Building Materials
Left and Right Wing Panels (2)		Isopropyl Alcohol
Left and Right Horizontal Stabilizers		30-minute Epoxy
Aileron Control Horns (4 sets of 2)		Paper Towels
Elevator Control Horns (2 sets of 2)		Toothpicks
Aileron Control Horn Bases (4)		Mixing Cups
Elevator Control Horn Bases (2)		Mixing Sticks (something to mix epoxy with)

Locate the aileron and elevator control horns. Be sure to keep them identified and separate. Note there are two different lengths of control horns for the ailerons. The shorter control horns are used for the location nearest the fuselage, and the longer control horns are used for the location nearest the wing tip.
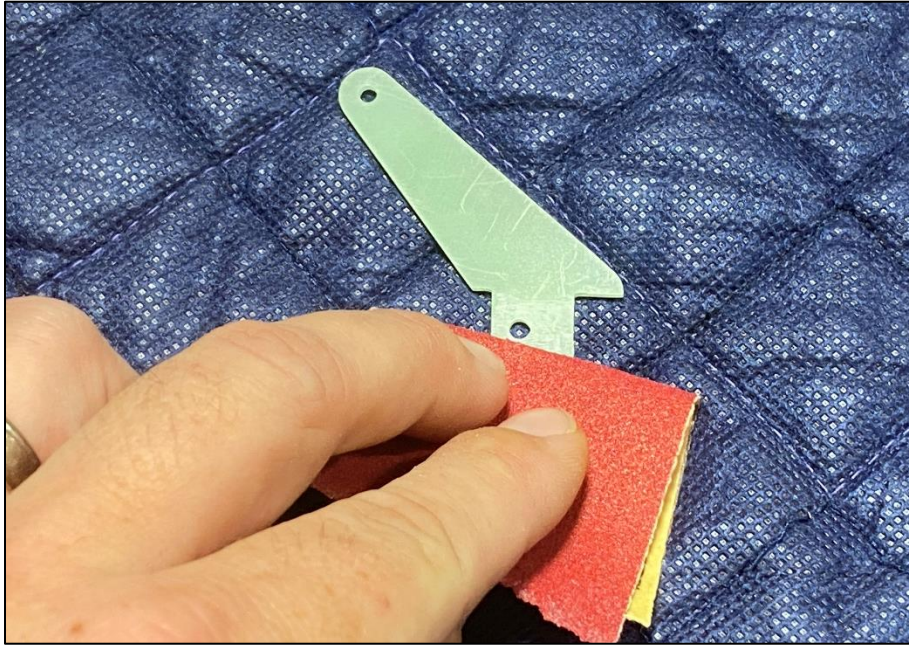
Scuff each control horn with medium grit sandpaper where it enters the control surface. Use a paper towel and isopropyl alcohol to clean up the control horn after it has been scuffed.
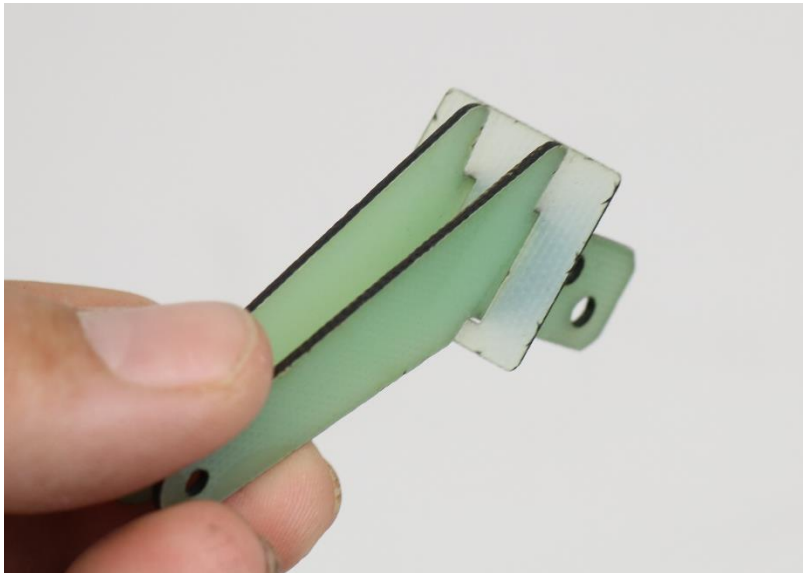
Slide the control horns through the square control horn base, and test fit them in their corresponding slots. Note that the holes in the control horn base are offset. This is so that the base does not extend over the hinge line. Adjust the holes in the control surfaces to fit the control horns if needed.

Apply 30-minute epoxy to the control horn slots and control horns and insert the control horns into their corresponding slots. Double check the aileron control horns to ensure you have them in their proper tip or root locations. Use a paper towel and isopropyl alcohol to clean up any excess epoxy. Set the parts aside and let the epoxy fully cure.

Seth's Pro Tips:

- Use a ball link and the corresponding hardware to keep the two parts of each control horn aligned while the epoxy cures.
- If space permits in your build area, you can begin working on hinging the rudder while the epoxy is curing for the aileron and elevator control horns.

RUDDER INSTALLATION

Required for this section

Components	Tools	Adhesives/Building Materials
o Rudder		o Isopropyl Alcohol
o Fuselage		o 30-minute Epoxy
		o Petroleum Jelly
		o Paper Towels
		o Mixing Cups
		o Mixing Sticks

☐ 1. Confirm the hinges are installed into the rudder by the factory by pulling on them slightly. Begin by test fitting the hinges into the fuselage. Verify that everything aligns with a minimal hinge gap, while still allowing for full travel. If you have a hinge gap of 1/16-inch (1.5mm) or more, use a hobby knife to slightly bevel the hinge holes in the fuselage and test fit again, always being sure to check for full rudder travel.
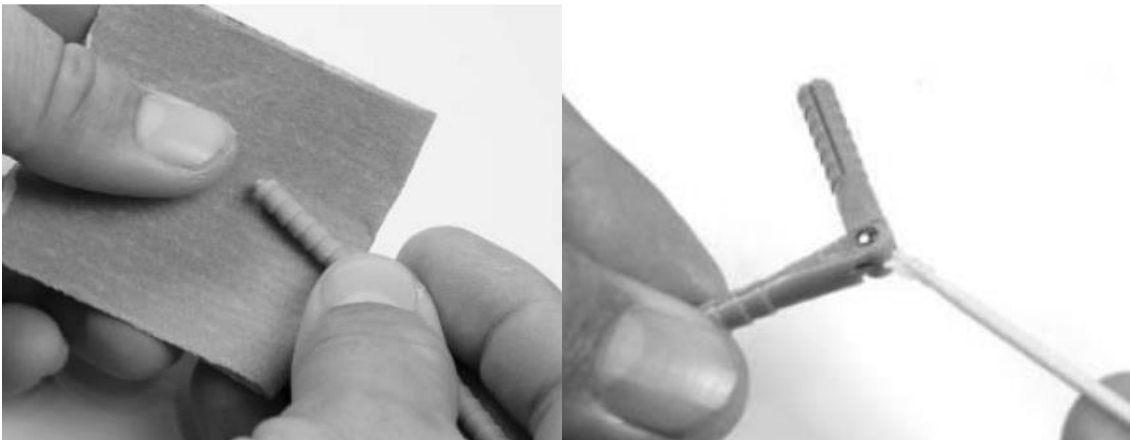
☐ 2. Once satisfied with the fitment, scuff each hinge with medium grit sandpaper, and use isopropyl alcohol to clean any debris from the hinge. Apply a small amount of petroleum jelly to the pivot of each hinge, being sure to avoid applying petroleum jelly to any surface that you want the epoxy to adhere to.

☐ 3. Mix an adequate amount of 30-minute epoxy and apply it to each hinge hole, along with a small amount to each hinge. Insert the hinges into the fuselage, being sure to wipe up any excess epoxy with a paper towel and isopropyl alcohol. Confirm that your hinge gap is minimal and that you get full travel of the rudder. Secure the rudder to the fuselage using low-tack tape.

Seth's Pro Tip:

I recommend sealing the rudder gap after you have finished hinging the rudder. My preferred method is to use white Oracover or Ultracote. I trim the covering to the appropriate size needed and mark each hinge location with a felt-tipped pen. I then use a paper hole punch to cut holes in the covering for each hinge before adhering the covering to the hinge line.

AILERON SERVO AND LINKAGE INSTALLATION

Required for this section

Components	Tools	Adhesives/Building Materials

Components

- Main Wing Panels (2)
- Aileron Linkage (4)
- Aileron Servos (4)
- Aileron Servo Arms (4)
- Tip Aileron Servo Extensions
- Ball Links (8)
- M3 x 15 Socket Head Cap Screw (4)
- M3 x 20 Socket Head Cap Screw (4)
- M3 Washer (16)
- M3 Lock Nut (8)
- M3 Conical Spacer (4)

Tools

- 2.5mm Hex Driver
- 5.5mm Nut Driver
- #1 Phillips Screwdriver

Adhesives/Building Materials

- Thin CA
- Blue Thread Lock
- Heat shrink, dental floss or safety clips

☐ 1. Use a #1 Phillips screwdriver to thread a servo mounting screw into each of the pre-cut holes in the servo mounting rails in the wing. Remove the screw and apply a small amount of thin CA to each of the holes to harden the threads cut by the screw. Do not use CA accelerator. Let the CA fully cure before moving forward.

☐ 2. Assemble your servo grommets per your servo manufacturer's instructions.

Seth's Pro Tip:

Many servo grommet brass eyelets will fit over most hex drivers. Slide all the eyelets over the hex driver, flared end first. Use the hex driver to push the eyelets into the servo grommets one right after the other for easier installation.

☐ 3. Secure a servo extension to each of the two tip aileron servos. Use servo connector safety clips (FPZA1040), heat shrink or dental floss to secure the extension.

☐ 4. Insert the aileron servo into the servo bay with the output shaft towards the **trailing edge** of the wing. Be sure to route the servo lead out of the wing before mounting the servo. There is string routed through the wing to assist you in pulling the tip aileron servo extension through the wing. Mount the servo to the wing using the servo mounting screws provided with your servos.

☐ 5. Using an aileron pushrod, assemble the aileron linkages so that the total length from center of ball to center of ball is approximately 3-1/2 inches (89mm). Final length will be adjusted when centering the control surface. Note that one end of each aileron linkage has left-hand threads, while the other end has right hand threads.

Seth's Pro Tip:

Use a set of digital calipers to measure the length of threads exposed on each end of the linkage. This allows you to ensure that the ball links are equally threaded onto each end of the linkage.

☐ 6.   Attach the linkage to the servo arm. The correct hole location is 1 ¾-inches (44.5mm) from center. If using the recommended 2-inch servo arm, this is the second hole from the end of the servo arm. The order of hardware components, starting from the top of the servo is as follows:

- o   M3x20 socket head cap screw
- o   M3 washer
- o   Ball Linkage
- o   Conical Spacer (narrow, pointed side towards the ball link)
- o   Servo Arm
- o   M3 washer
- o   M3 locknut

☐ 7.   Use your radio system power on the servos to center them. Install your aileron servo arm onto the servo as close to parallel with the hinge line as possible. Apply blue thread lock to the servo arm output shaft screw and fully tighten the screw. If your servo arms have clamping screws, apply blue thread lock, and secure them in place as well. Once complete, use sub-trim to fine tune the center position of the servo to be perfectly parallel to the hinge line.

☐ 8. With the radio powered-on and the servo arm parallel to the hinge line, Connect the tip aileron servo linkage to the control horn with the hardware in the following order:

- o M3x15 Socket Head Cap Screw
- o M3 Washer
- o Control Horn (Side 1)
- o Ball Link
- o Control Horn (Side 2)
- o M3 Washer
- o M3 Lock Nut

☐ 9. Center the control surface by lengthening or shortening the linkage as needed.

Note: The angle of the linkage when centered is correct. As the servo arm rotates and the control surface deflects, the linkage will straighten.

☐ 10. Once the tip aileron servo is connected, set your end points in both directions so that the ailerons travel 140mm in each direction at the root of the aileron at high rates. Once complete, center the root servo, and adjust the linkage so that there is no binding with the tip servo at neutral. Deflect the servos to maximum and adjust the root servo end points to match the tip servo in both directions. Once satisfied with the matching of the servos, attach the linkage to the control horn using the same order of components used previously.

Seth's Pro Tip:

When matching the root servo to the tip, don't connect the linkage to the control horn of the root servo. Instead, place the ball link in the control horn, and sight down the hole in the control horn to see the alignment of the ball link hole with the control horn hole. Also, you can use a hex driver with a 3mm shaft (like MIP hex drivers) to insert through the hole instead of sighting the alignment. If the driver slides easily through the hole, its aligned. If not, you still need to adjust.

ELEVATOR SERVO AND LINKAGE INSTALLATION

Required for this section

Components

o Left and Right Horizontal Stabilizers (2)
o Elevator Servos (2)
o Elevator Servo Arm (2)
o M3x15 Socket Head Cap Screw (8)
o M3 Washer (8)
o M3 Lock Nut (4)
o M3 Conical Spacer

Tools

o #1 Phillips Screwdriver
o 2.5mm Hex Driver
o 5.5mm Nut Driver

Adhesives/Building Materials

o Dental Floss, Heat Shrink or Safety Clips

1. Use a #1 Phillips screwdriver to thread a servo mounting screw into each of the holes in the servo mounting rails in the horizontal stabilizer. Remove the screw and apply a small amount of thin CA to each of the holes to harden the threads cut by the screw. Let the CA fully cure before moving forward.

2. Assemble your servos as needed based on your servo manufacturer's recommendations.
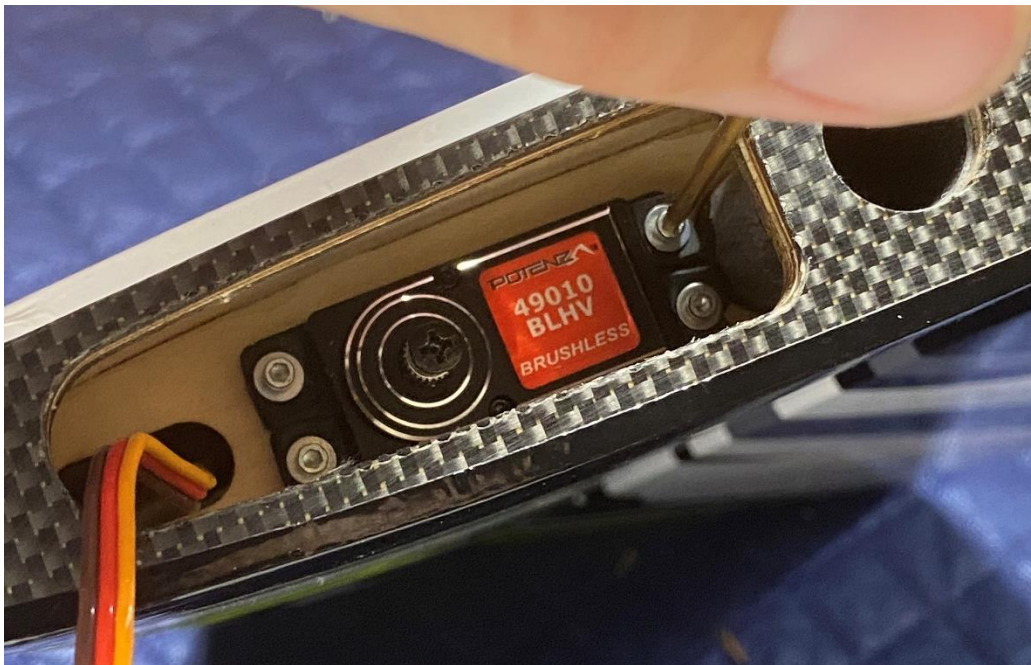
3. Insert the elevator servo into the mounting location with the output shaft towards the leading-edge of the stab. Mount the servo to the stab using the mounting screws provided with your servos. Note that the servo wire will exit on the leading-edge side of the stab as shown in the picture above.

4. Power on your radio system to center the servo. Install a 2-inch (51mm) servo arm onto the servo as close to perpendicular with the servo's case as possible. Apply a small amount of blue thread lock to the servo arm screw and secure it in place. If your servo arm has clamping screws, apply blue thread lock to these screws and secure them in place. Note that you may need to power off the model and rotate the servo arm by hand to have access to each clamping screw. Use sub-trim to perfectly center the servo the remainder it may need to move.

5. Using an elevator pushrod, assemble the elevator linkages and ball links so that the total length from center of ball to center of ball is approximately 3 3/8-inches (86mm). Final length will be adjusted when centering the control surface. Note that both ends of the elevator linkages have opposite direction threads.

6. Attach the linkage to the servo arm. The correct hole location is 2-inches (51mm) from the center of the servo arm. If you are using the recommended servo arm, this is the hole at the end of the servo arm. The order of hardware components, starting from the top of the servo is as follows:

   o M3x20 socket head cap screw
   o M3 washer
   o Ball Linkage
   o Servo Arm
   o M3 washer
   o M3 locknut

Note: There is a conical spacer supplied with the elevator linkage hardware. If using the recommended servo and servo arm, this spacer is not used. If using another brand of servo or arm, you may need to use this spacer to keep the linkage perpendicular to the hinge line. Most of the time, it is not needed.

7. Attach the linkage to the control horn. The order of hardware components, starting from the tip of the stabilizer is as follows:

   o M3x15 socket head cap screw
   o M3 washer
   o Control Horn #1
   o Ball Linkage
   o Control Horn #2
   o M3 washer
   o M3 locknut

8. With the radio powered on and the servo arm centered perpendicular to the servo case, adjust the linkage length so that the control surface is centered.

Seth's Pro Tips:

- For elevator centering, it is best to install the stabilizers onto the fuselage and stand approximately 10 feet (3m) behind the aircraft while sighting the two elevator halves. Using this method, you can best align the most important part of the control surface, the wider section, rather than referencing something less important, like the elevator counterbalance.
- Install the control horn screw with the head of the screw towards the tip of the horizontal stabilizer. In this way, you have access to the screw head with your hex wrench when the horizontal stabilizer is installed, allowing you to make any needed repairs more easily at the field.
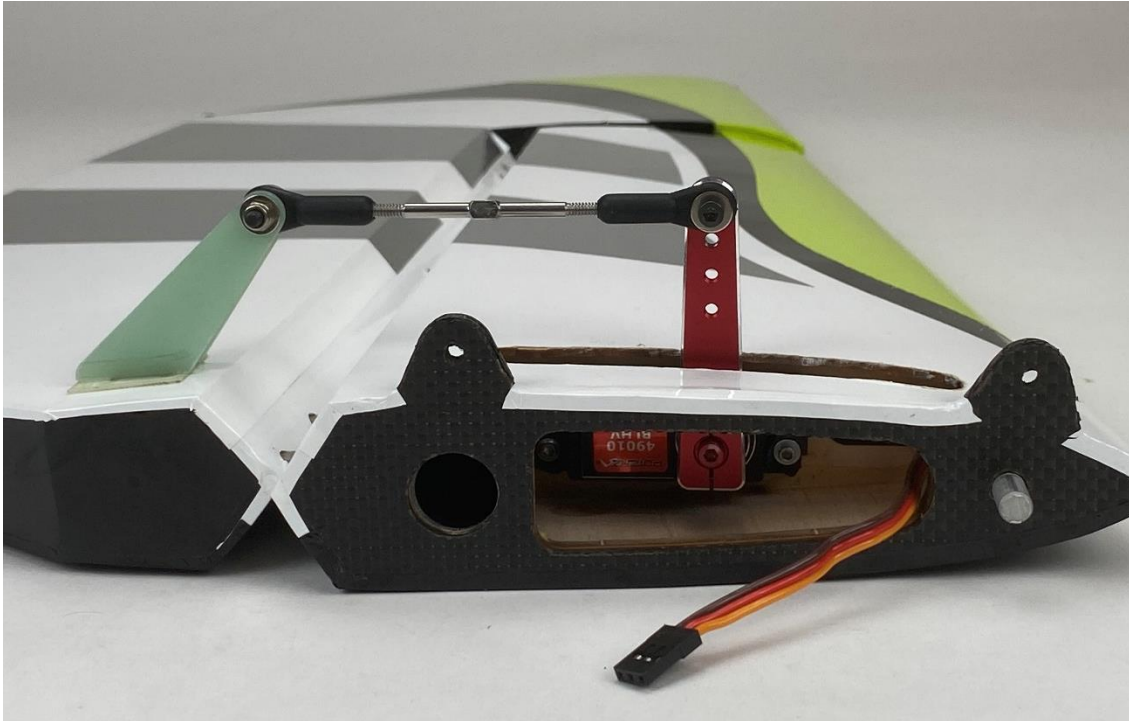
☐ 9.   After installation is complete, your linkage setup should match the image above. Repeat the same procedure for the other horizontal stabilizer.
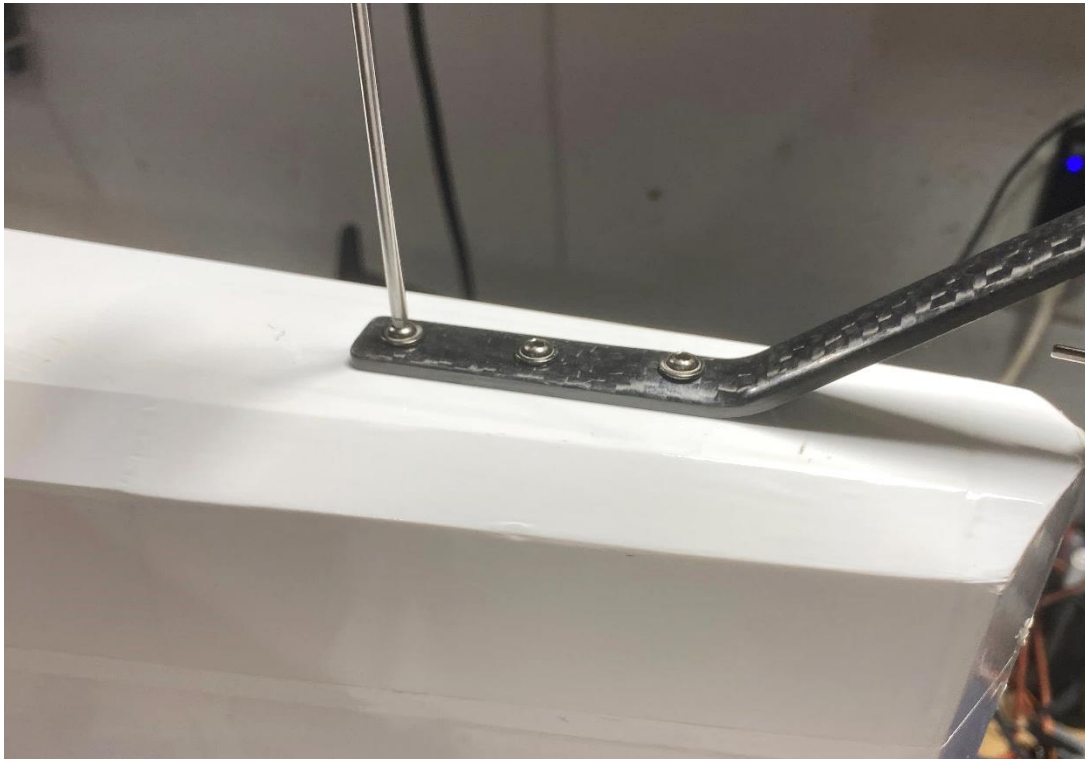
TAILWHEEL INSTALLATION

Required for this section

Components

- ○ Fuselage
- ○ Tail Gear Assembly
- ○ Steering Ball Link (1)
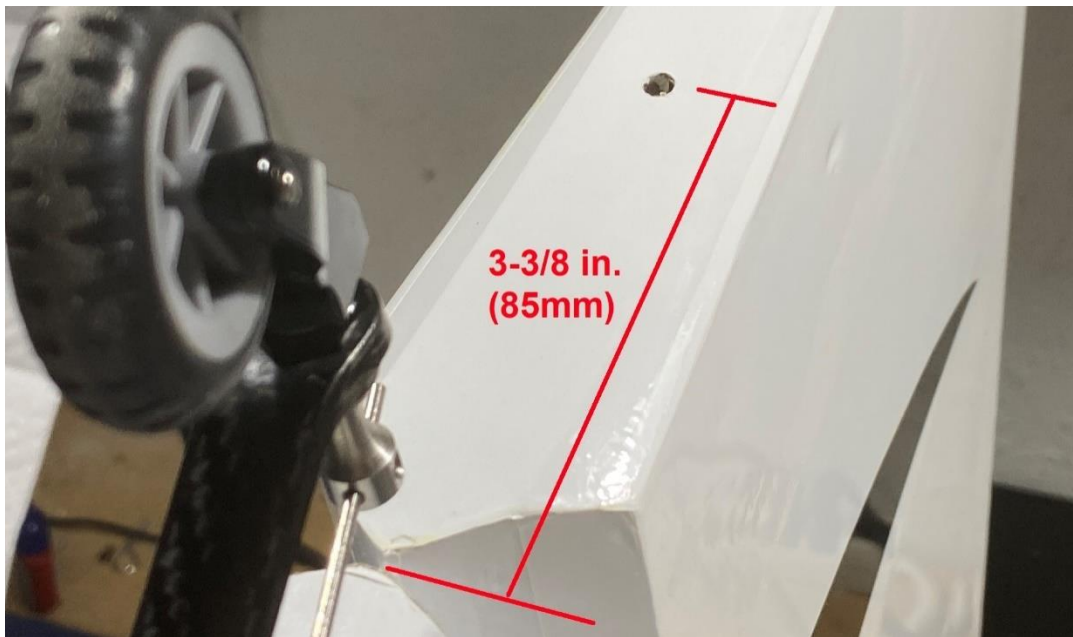- ○ M3 x 16 Button Washer Hea Screws (3)

Tools

- ○ 2.5mm Hex Driver

Adhesives/Building Materials

- ○ Blue Thread Lock
- ○ Isopropyl Alcohol
- ○ 30-minute Epoxy
- ○ Mixing Cups
- ○ Mixing Sticks
- ○ Paper Towels

☐ 1. Apply Thread Lock to the screws and use a 2.5mm hex driver to mount the tail gear assembly as shown in picture above.

☐ 2.   Locate the hole in the bottom of the rudder that will accept the ball link for the steering arm. It is located approximately 3-3/8 inches (85mm) aft of the rudder hinge line. Use a hobby knife with a #11 blade to remove the covering from the hole.

☐ 3.   Scuff the cylindrical part of the ball link with a medium grit sandpaper. Clean the ball link with isopropyl alcohol and a paper towel to remove any leftover plastic particles.
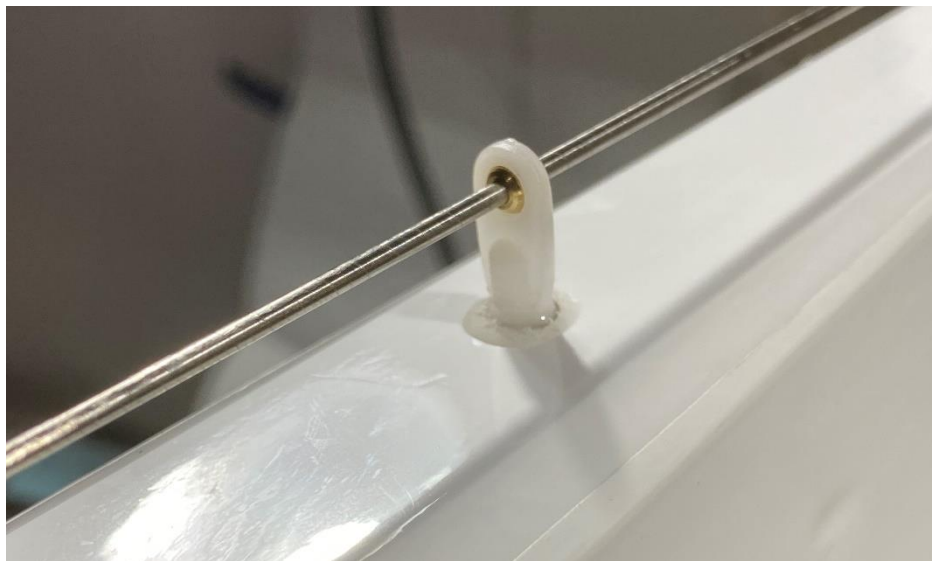
☐ 4.   Once clean and dry, slide the wire steering arm through the ball link. Mix a small amount of 30-minute epoxy and glue the steering ball link into the hole, being sure to keep the ball link square to the bottom of the rudder, as well as perpendicular to the wire steering arm. Allow a small fillet of epoxy around the ball link for added strength.

☐ 5.   Once the epoxy has cured, trim the steering wire allowing for approximately 5/16-inch (8mm) of excess wire to extend past the ball link. Once complete, rotate the rudder to ensure everything moves freely without binding.

LANDING GEAR INSTALLATION

Required for this section

Components

- o Fuselage Assembly
- o Wheel Pants (L & R)
- o Main Wheel (2)
- o M6x25 Socket Head Cap Screw (4)
- o M6 Flat Washer (8)
- o M6 Lock Nut (4)
- o M3x15 Socket Head Cap Screw (4)
- o M3 Flat Washer (4)
- o Landing Gear Axle (2)
- o M6 Wheel Collar (4)

Tools

- o 1.5mm Hex Driver
- o 2.5mm Hex Driver
- o 5mm Hex Driver
- o 10mm Wrench
- o 13mm Wrench
- o Felt-Tipped Pen

Adhesives/Building Materials
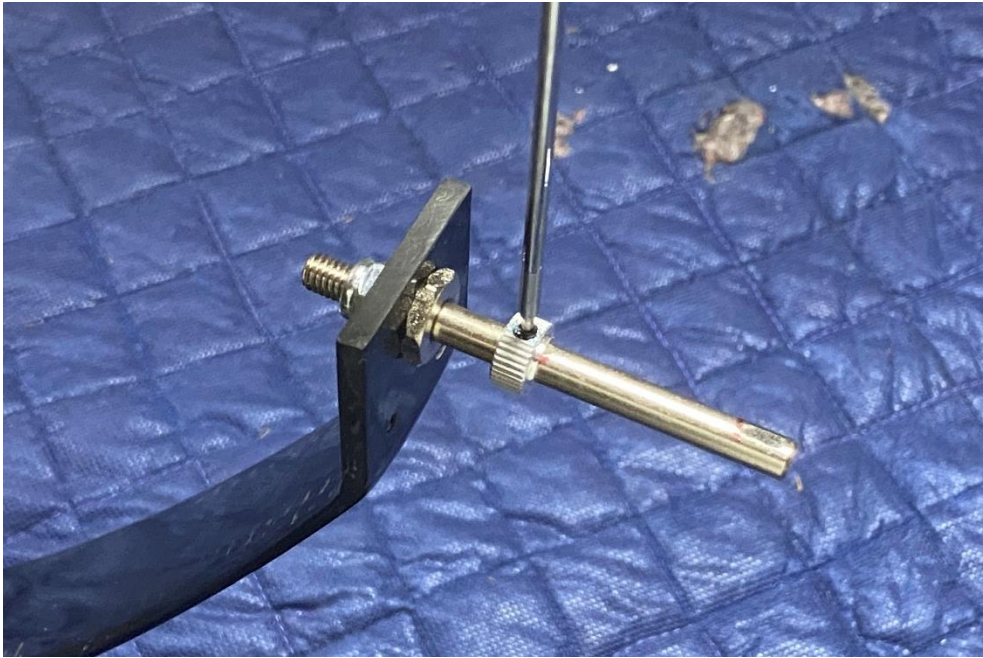
- o Blue Thread Lock

☐ 1. Assemble the axle to the landing gear leg. Use one M6 flat washer between the lock nut and the landing gear leg as shown above. Fully tighten using a 10mm and 13mm open end wrench.

☐ 2.   Slide the wheel onto the axle, and temporarily install the wheel pant using 2 M3 x 15 socket head cap screws and 2 M3 washers. Note that the landing gear sweeps forward toward the nose as it moves away from the fuselage. Center the wheel in the wheel pant opening and use a felt-tipped pen to mark both sides of the wheel


☐ 3.   Remove the wheel pants and wheel from the axle. Noting the location of your marks, use a file to make two flat spots on the axle. Do not remove too much material, as this can weaken the axle. You want just enough of a flat spot to allow for the wheel collar set screw to tighten securely.

☐ 4. Slide an M6 wheel collar onto the axle with the shoulder facing the wheel. Using blue thread lock and a 1.5mm driver. Secure the set screw for the wheel collar in place. Apply a small amount of oil to the axle and slide the wheel into place. Slide the remaining M6 wheel collar onto the axle with the shoulder facing the wheel and use blue thread lock when securing the set screw in place.

☐ 5. Secure the wheel pants in place using 2 M3 x 15 socket head cap screws and 2 M3 washers.

Seth's Pro Tip:

To help prevent damage to the wheel pants, leave the wheel pants off the aircraft until you have completed the aircraft and are ready to check the center of gravity. You can thread the wheel pant mounting screws into the wheel pants to save everything for later without losing the hardware.
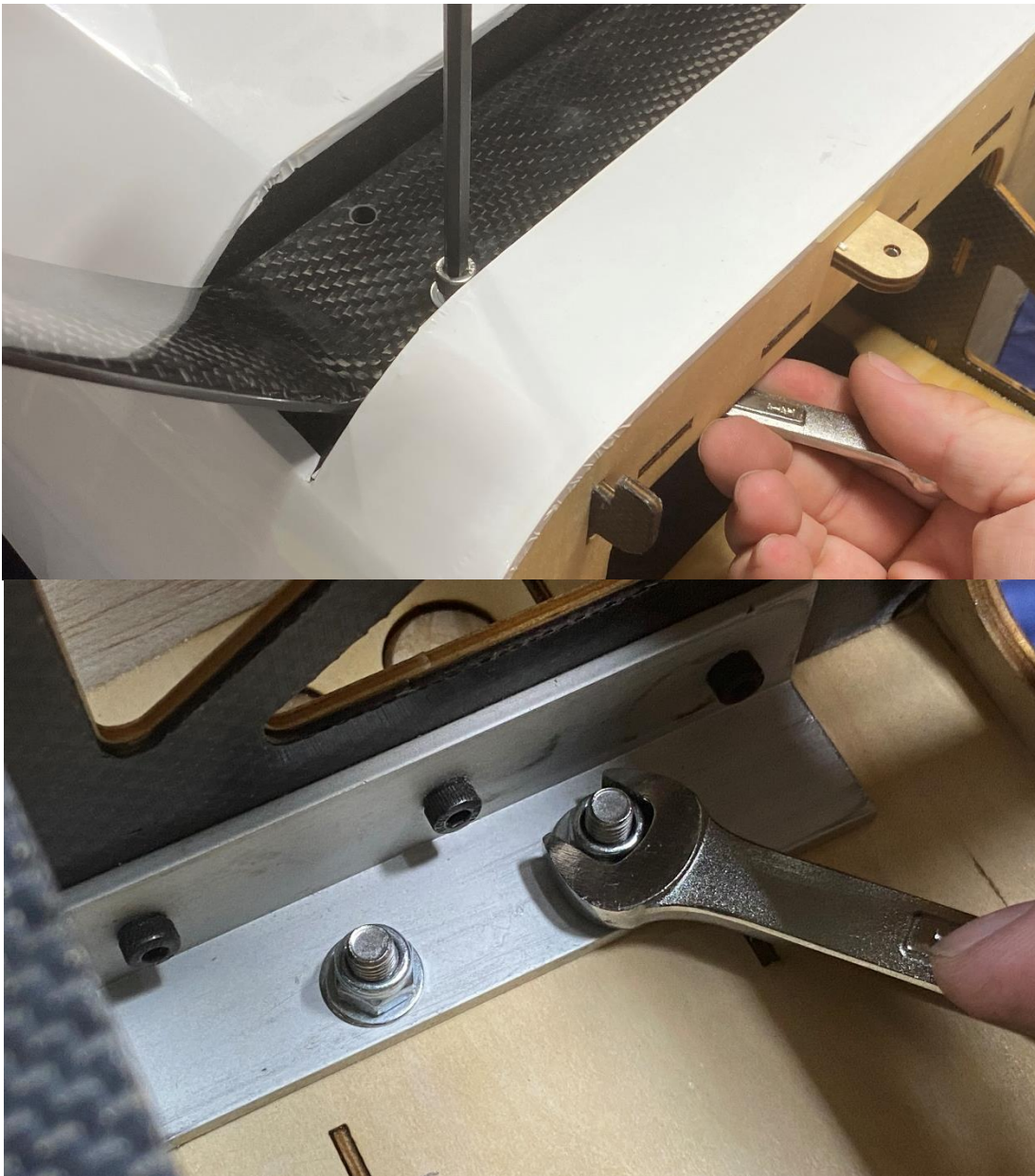
☐ 6. With the fuselage inverted on your workspace, place the landing gear on the fuselage so that it sweeps forward towards the nose as it moves away from the fuselage. Due to the placement of the holes for the landing gear, you should only be able to align the landing gear in one orientation. Place an M6x25 socket head cap screw with an M6 washer through the landing gear and through the landing gear mount in the fuselage. Note that there are no threads in the aluminum angle mount in the fuselage. Place an M6 washer over the screw on the inside of the fuselage, followed by an M6 lock nut. Tighten the screws using a 5mm hex driver and a 10mm open end wrench. Do not fully tighten until all four M6 screws are in place, and all the M4 lock nuts have been started. Do not use thread lock, as it can damage the nylon in the locking portion of the lock nut.

ENGINE INSTALLATION

The Edge 540 120cc is designed around 100-125cc engines.

This manual covers the installation of the DA-120.

DA-120 ENGINE INSTALLATION

Required for this section

Components	Tools	Adhesives/Building Materials
o Fuselage Assembly	o Drill	
o Engine	o ⅛-inch (3mm) Drill Bit	
o Engine Standoffs (20mm)	o ¼-inch (6mm) Drill Bit	
o ¼-20 Lock Nut (4)	o ¼-inch Hex Driver	
o ¼-20 x 1-3/4-inch Socket Head Cap Screw (4)		
o ¼-inch flat washer (4)		
o ¼-inch fender washer (4)		

☐ 1. The engine mounting location for the DA-120 and GP-123 is laser-etched into the firewall for your convenience. If using a different mounting pattern, the "+" represents the engine crankshaft. Use a ⅛-inch drill bit and drill to create a pilot hole in the center of the four bolt hole etchings in the firewall. Use a ¼-inch drill bit to enlarge these holes to the appropriate size. There is also a laser etching for the throttle linkage just below and to the left of the lower right mounting hole (when looking at the firewall from the front). You can open this hole at this time as well if using the DA-120. Other engines may require a different hole.
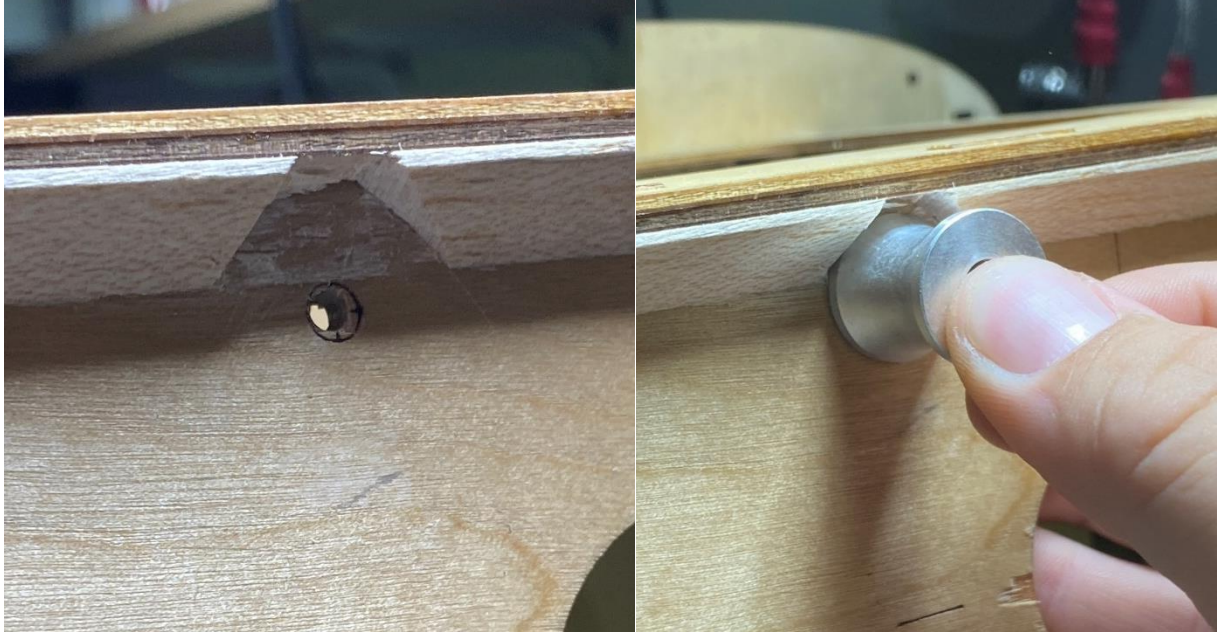
☐ 2.   Use a hobby knife to remove a small section of the triangle stock near the upper mounting holes for the engine. Be sure to remove the triangle stock completely as this is to allow room for the engine standoffs to sit squarely on the firewall.

☐ 3.   Mount the engine (without the exhaust) to the firewall using (4) 20mm engine standoffs, (4) ¼-20 x 1-3/4-inch socket head cap screws, (4) ¼-inch flat washers, (4) ¼-inch fender washers and (4) ¼-20 Lock Nuts. The order of components is as follows:

   o   ¼-20 x 1-3/4-inch Socket Head Cap Screw
   o   ¼-inch flat washer
   o   Engine
   o   20mm Engine Standoffs
   o   Firewall
   o   Fender washer
   o   Lock nut

Note: You may need to trim 3 of the 4 fender washers to allow space for the triangle stock on the upper two mounting points, as well as allow room for the throttle linkage.

DA-120 THROTTLE SERVO AND LINKAGE INSTALLATION

Required for this section

Components

o Fuselage Assembly
o Throttle Servo
o 18-inch (460mm) Servo Extension
o 2mm White Ball Link
o M2x10 Phillips Head Screw (1)
o M2 Flat Washer (2)
o M2 Lock Nut (1)

Tools

o #1 Phillips Screwdriver
o 2.5mm Hex Driver

Adhesives/Building Materials

o Thin CA
o Blue Thread Lock
o Heat Shrink, Dental Floss or Safety Clips

☐ 1. Thread a servo mounting screw into each of the four mounting screw holes in the motor box. Apply thin CA to each of the holes to harden the threads.

☐ 2. Attach the 18-inch (460mm) servo extension to the throttle servo. Use a Servo Connector Safety Clip (FPZA1040), thread or heat shrink tubing to secure the extension in place. Mount the servo with the output shaft towards the nose of the aircraft and route the servo extension appropriately through the aircraft.

☐ 3. Use the radio system to center the servo, then install a plastic servo arm onto the servo.

☐ 4. Locate the pushrod that is approximately 125mm in length and threaded on both ends. Thread a white ball link approximately halfway on to each end of the linkage. Adjust the length so that it is approximately 152mm in length from center of ball to center of ball. This length may need to be adjusted later.

☐ 5. Use an M2x10 socket head cap screw, M2 washer, and M2 lock nut to secure one end of the linkage to the throttle arm on the carburetor. On the DA-120, this is the outermost hole on the throttle arm. The order of components is as follows:

o M2x10 Socket Head Cap Screw

- o M2 Washer
- o Throttle Arm
- o M2 Lock Nut

☐ 6. Use an M2x10 socket head cap screw, M2 washer, and M2 lock nut to secure the other end of the linkage to the servo arm. For the DA-120, this is a servo arm with a length of approximately ¾-inch (19mm). The order of components is as follows:
- o M2x10 Socket Head Cap Screw
- o M2 Washer
- o Throttle Arm
- o M2 Lock Nut

Seth's Pro Tips:

- Use the shortest servo arm possible while still getting full throttle arm movement on your engine. Your throttle end points should be around 110-120% when finished with the installation. A faster servo (like the Potenza DS49010HV) with a shorter arm is preferred over a slower servo with a longer arm.
- For the most linear throttle response, adjust the throttle linkage length to balance the end points for your throttle servo. You do NOT want your end points to be mismatched (example: 60/120). Set your end points as close to one another as possible (example: 114/116) for the most linear throttle response.

IGNITION INSTALLATION

Required for this section

| Components	Tools	Adhesives/Building Materials
○ Fuselage Assembly ○ Ignition ○ Ignition Switch ○ Ignition Battery or IBEC ○ Regulator (if applicable)	○ Hobby Knife w/#11 Blade ○ #1 Phillips Screwdriver	○ Hook and Loop Strap (2) ○ Adhesive-Back Hook and Loop Tape

☐ 1. Locate the ignition switch hole towards the nose of the fuselage. Note that there are switch locations on both sides of the fuselage for your preference. Use a hobby knife with a #11 blade to remove the covering from the hole of your choice. Test fit your switch and modify the hole if needed. Secure it in place using the screws included with your switch. If your switch mounting screws thread into metal, be sure to apply blue thread lock. DO NOT apply blue thread lock if they thread into plastic.
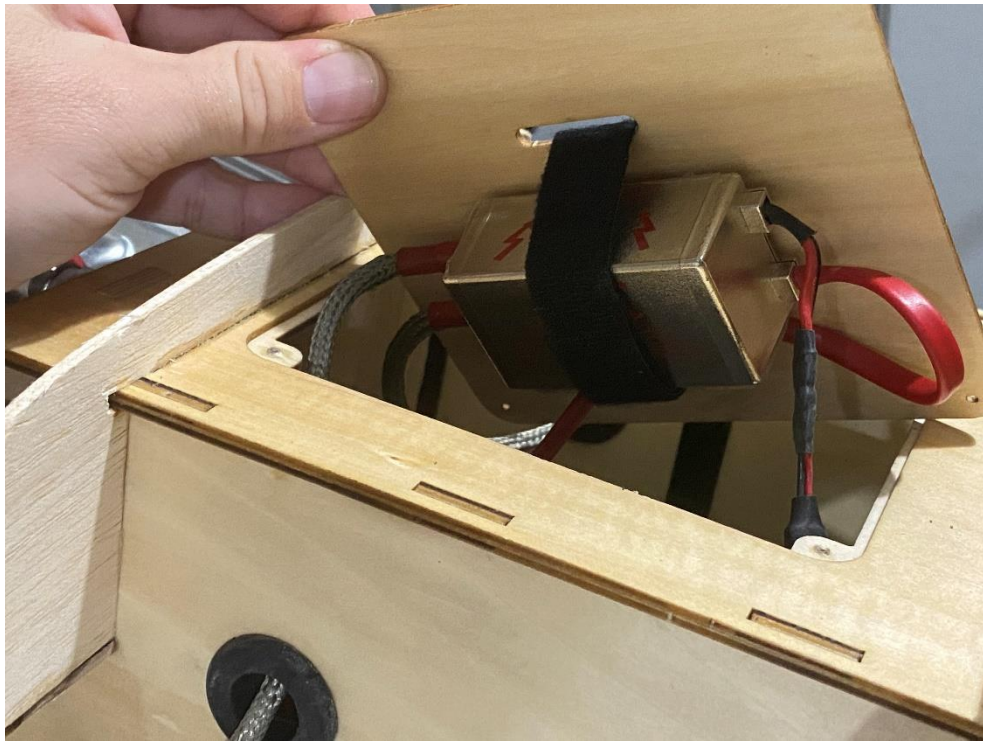
☐ 2. The ignition can be mounted wherever you prefer. We have found that with the DA-120, the underside of the motor box hatch is a preferred location. Note that it will interfere with the cowling if mounted on the top or outside of the hatch. There are many ways to install an ignition and we recommend you mount it per your engine manufacturer's instructions.

☐ 3. If you are using an ignition battery, we recommend using a 2S 2000mAh Li-Po (FPZBR20002S15) placed on the outside of the motor box hatch. Use adhesive-backed hook and loop tape between the battery and the hatch and secure the battery with a hook and loop strap.

☐ 4. Route all your ignition wiring and make all electronic connections. Secure any permanent connections with heat shrink, dental floss or servo safety clips (FPZA1040). Be sure to secure the wiring so that it will not bounce around in the aircraft. Also, be sure to secure the wiring in a way the wires will not chafe against sharp edges from vibration. A typical ignition setup will be connected as follows:

Ignition Battery → Ignition Switch → Ignition Regulator → Ignition → Engine

Or (if using an IBEC):

Receiver Channel → IBEC → Ignition → Engine
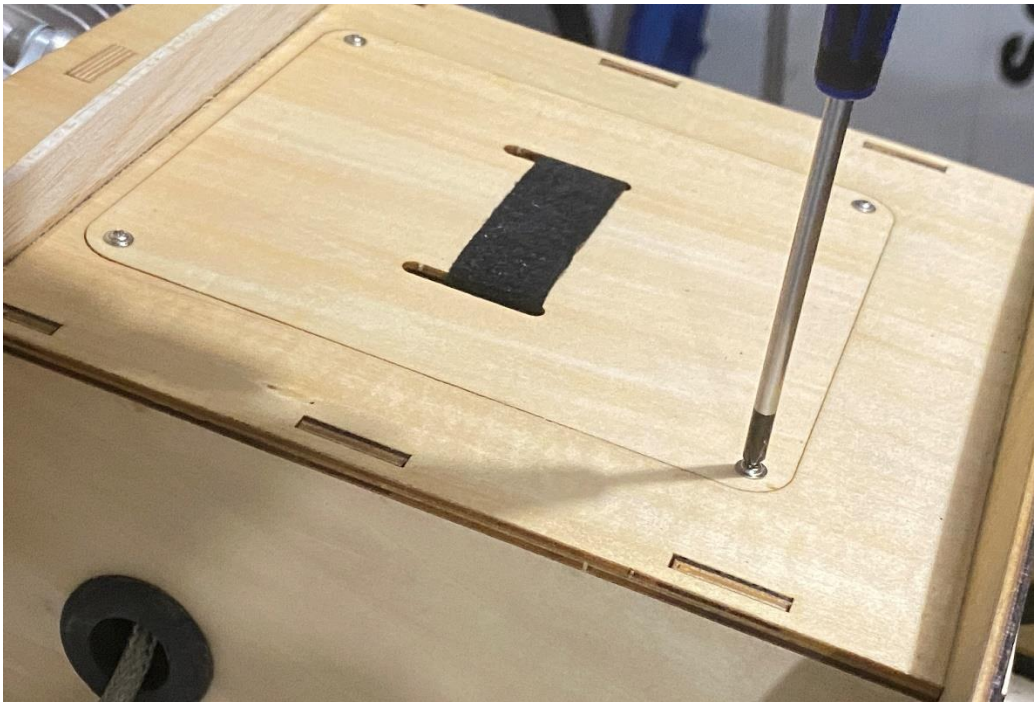
☐ 5.   Locate the (4) M2.5 x 8mm wood screws for the motor box access hatch. Use a #1 Phillips screwdriver to thread an M2.5 x 8mm screw into each of the pre-cut holes in the motor box. Remove the screw and apply a small amount of thin CA to each of the holes to harden the threads cut by the screw. Repeat this process two more times. Let the CA fully cure and install the motor box access hatch.

FUEL TANK INSTALLATION

Required for this section

| Components	Tools	Adhesives/Building Materials
o Fuselage Assembly o Fuel Tank o Fuel Line	o Pliers	o Hook and Loop Strap (2) o Adhesive-Back Hook and Loop Tape o Cable Ties

The Flex Innovations Lightweight 32oz Fuel Tank is included with your Edge 540 120cc. Before installing the fuel tank check all fittings are properly installed and that the clunk line inside the tank is appropriately sized. Adjust as necessary.
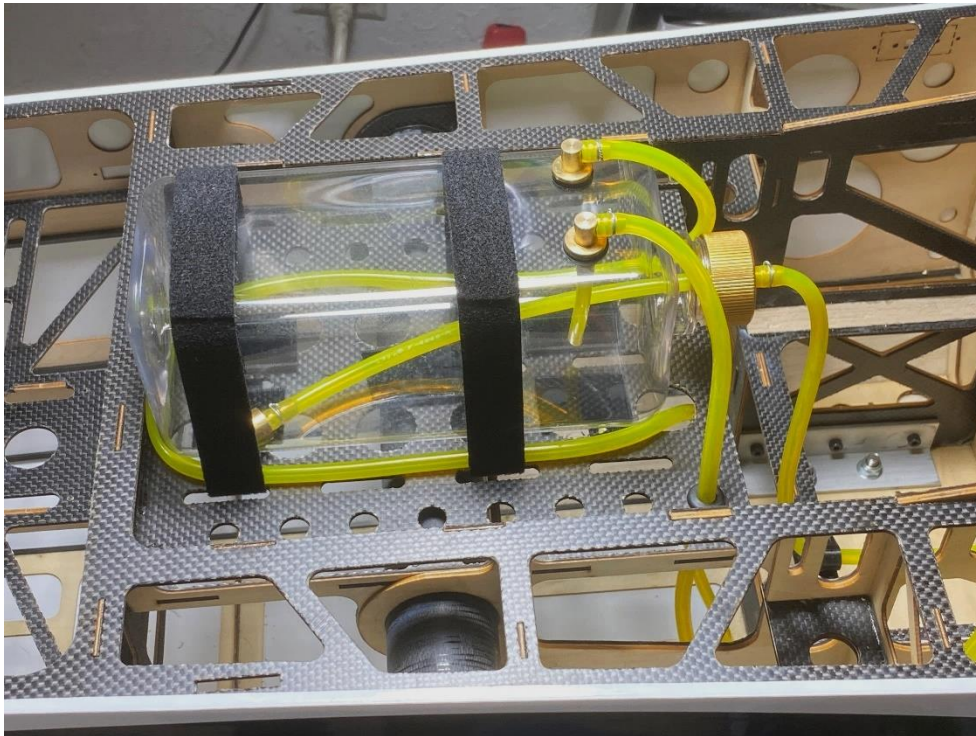
☐ 1.　The fuel tank tray has plenty of room for your fuel tank. If you are using a single tank, you can place the fuel tank in the middle of the tray as shown in the image above. If you plan on using a smoke system, two of the 32oz Lightweight Fuel/Smoke tanks (FPM1623) should be used, installed side by side. One is included in your kit.

Apply adhesive-backed hook and loop tape to the bottom of your tank(s) and to the fuel tank tray. Place the tank(s) in their location and secure them with two hook and loop straps. These straps should be snug but not overly tight, as the fuel tanks are very lightweight and can be easily crushed. The hook and loop tape on the bottom of the tank(s) will prevent the tank from moving fore and aft, and the hook and loop straps will prevent the tank from pulling away from the tray. Be sure that you leave some space between the rear of the fuel tank and the structure behind it to prevent chafing.
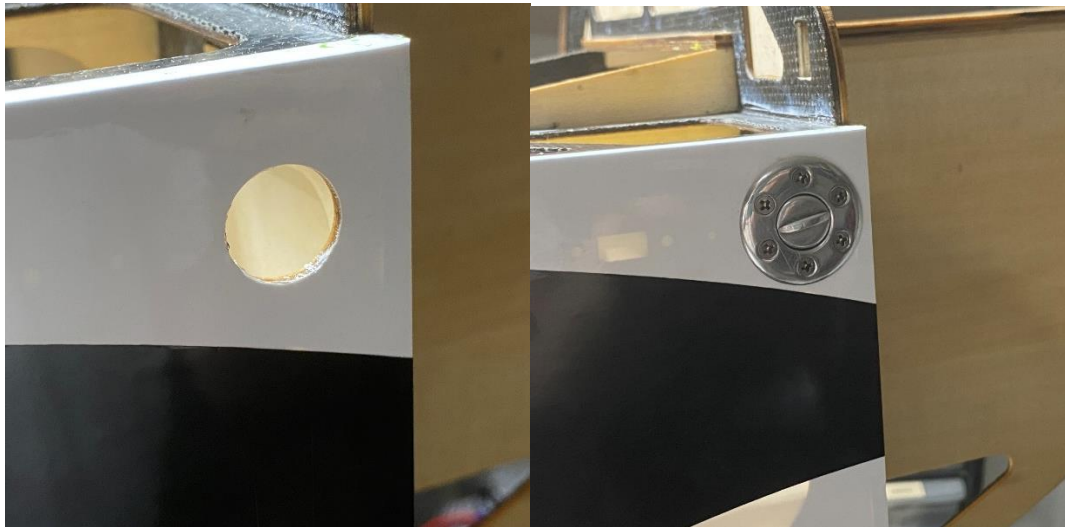
☐ 2.   After the tank is in position, route and trim your fuel lines appropriately. Your clunk line should go to the carburetor or throttle body. The fill line should go to your fuel dot or filling system. We recommend the McFueler Fuel Dot (FPMAMCFUELER). The vent line should wrap around the back of the tank(s) and pass back in front of the tank(s). It should then exit the bottom of the fuselage. After the vent line exits the fuselage, use a cable tie around the fuel line to prevent it from slipping back into the fuselage. Don't overtighten the cable tie, as air and fuel will need to vent from this line. Be sure to keep your fuel line away from components that get hot (like your exhaust or cylinder heads) and route it in such a way that it will not bounce around or chafe on any of the interior structure of the fuselage.

Seth's Pro Tip:

Use a soldering iron with a fine tip to open holes in the covering for things like switches and fuel dots. Not only does this remove the covering, but it also seals it to the edges of the hole.

EXHAUST AND COWLING INSTALLATION

Required for this section

Components	Tools	Adhesives/Building Materials
o Fuselage Assembly	o Rotary Tool	o Thin CA
o Cowling	o Rotary Tool Sanding	o CA Accelerator
o Cowling Baffles	Drum	o Blue Thread Lock
o Your Exhaust Choice	o Rotary Tool Cut-Off	o 30 Min Epoxy
o (4) M2.5 x 4 Wood Screws	Wheel	o Mixing Cups
o Motor Box Cover Plate	o Felt-Tipped Pen	o Mixing Sticks
o Canister or Pipe Mount	o Covering Iron	o Paper Towels

If you plan to use stock mufflers, please follow the instructions (A) below. If you plan on using a different exhaust setup, please follow canister instructions (B) on the following pages. Be sure to follow the engine baffling instructions for both setups. Different engines and exhaust setups may require significantly different installations. You will need to decide what is best for your setup.

MUFFLER INSTALLATION (A)
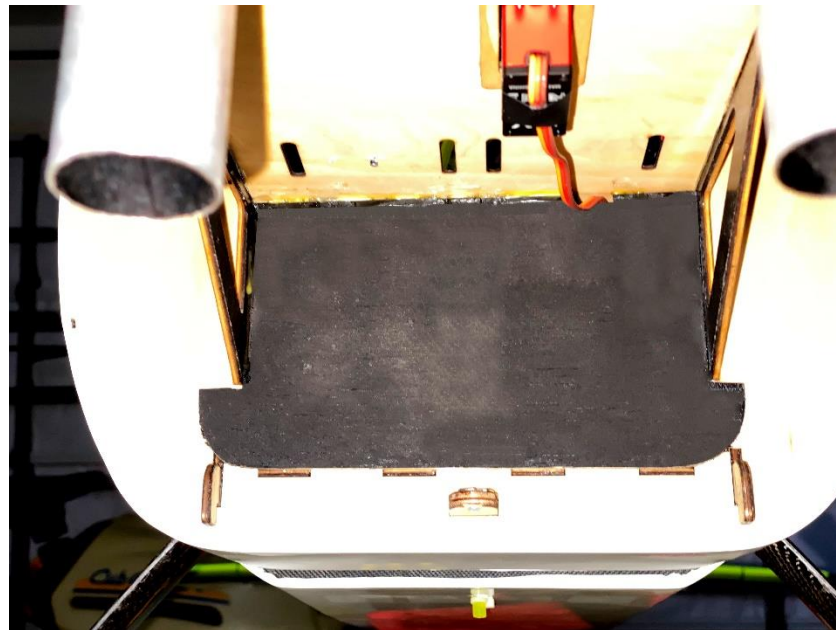
☐ 1A. With the fuselage inverted on your work bench, use medium CA or epoxy to install the fuselage blocking plate over the hole located below the motor box. This is an important part of the baffling system for the engine.
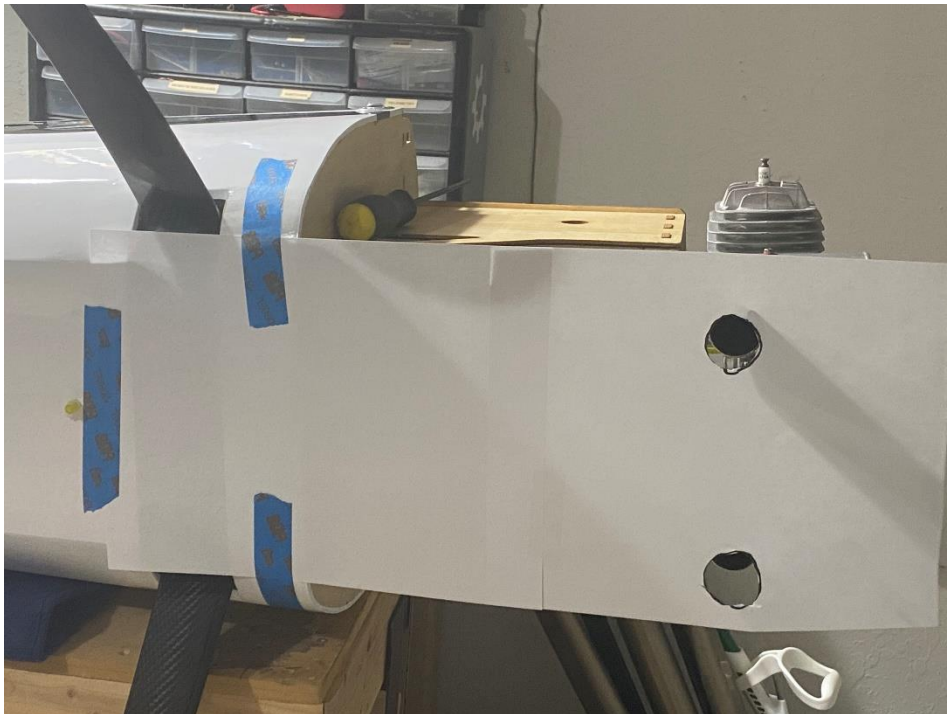
☐ 2A. Temporarily install the mufflers on the engine using the hardware provided with your engine. Follow your engine manufacturer's installation instructions. Use a couple sheets of paper and some low tack tape to secure the paper to the fuselage. You want the other side of the paper to extend over the exhaust exit holes. Mark the exhaust exit holes on the paper.

☐ 3A. Remove the mufflers from the airplane and install the cowling. Transfer the marks from the previous step onto the cowling using a felt-tipped pen. Once the marks are transferred, you can remove the tape and paper, as well as remove the cowling.

☐ 4A. Permanently install the mufflers on the engine following your manufacturer's instructions. Use a rotary tool with a sanding drum to begin cutting the cowling at the front edge of the marks completed in the previous step. Only remove a small amount of material at a time, and test fit the cowling in between each step. Take note of where the mufflers hit the cowling and continue removing material until you can fit the cowling on the aircraft with the mufflers installed. Remove the cowling.

Seth's Pro Tip:

Use the rotary tool and cut the cowling from the inside-out. This way, if the rotary tool slips when trying to cut the cowling, you don't damage the visible
side of the cowling.

☐ 5A.   Cut the rest of the cowling out, following the low-pressure lip shape in the cowling. Leave approximately 1/16-inch (1.5mm) of material along the low-pressure lip side of the cutout. Leave approximately ½-inch (12mm) of material at the rear edge of the cutout.

Seth's Pro Tip:

I like to shorten the mufflers about 7/8-inch (22mm). This aids in a little easier cowling install. However, be careful not to trim too much, as you do not want the exhaust to get into the cowling, particularly when running smoke. I recommend trimming the mufflers once the cowling is installed.

CANISTER INSTALLATION (B)

There are an extraordinary number of possible engine and exhaust combinations that we can't completely cover in this manual. This section will cover the typical setup as recommended at the beginning of this manual.

☐ 1B.   Assemble your header and canister or pipe per your exhaust manufacturer's recommendations and select a canister or pipe mount that fits your exhaust. Assemble the silicone tubing into the mount if needed. Included with the Edge 540 120cc is a mount for 60mm diameter exhausts, like the KS 3086 canister. If your exhaust is a different size, you'll need to make one, or get one from your exhaust or engine supplier.
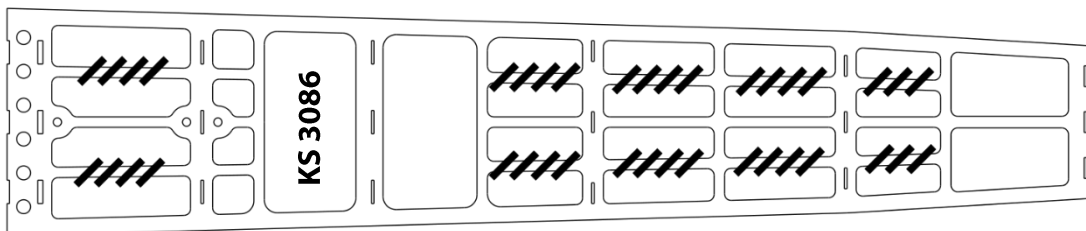
☐ 2B.   Temporarily insert your exhaust into the fuselage to locate where the exhaust should exit the bottom of the fuselage. Mark or note the area of the fuselage bottom plate and/or

covering that needs to be removed and remove the exhaust from the aircraft. The KS 3086 canister should exit in the opening just aft of the main wing tube.

There are a few sections where you may not need to remove wood, but if you find it necessary to remove material, only remove the areas noted with black hash marks above. Do not remove any additional material other than what is needed.

☐ 3B. Re-insert your exhaust into the fuselage and slide your canister mount over the exhaust. Decide the location that best suits your mount. For the provided mount and the KS 3086 canister, the optimum location is against the rear of the F2 former, located just aft of the landing gear mounting brackets.

☐ 4B. Mix an adequate amount of epoxy and glue the mount to the former decided upon in the previous step. You can use servo screws to secure the mount in place while the epoxy cures if desired.

ENGINE BAFFLING INSTALLATION

Required for this section

| Components	Tools	Adhesives/Building Materials
o Fuselage Assembly		o Medium CA
o Cowling		o CA Accelerator
o Cowling Baffles		o Blue Thread Lock
		o 30 Min Epoxy
		o Mixing Cups
		o Mixing Sticks
		o Paper Towels

Engine Baffling Requirements

During our testing, we found that the cowling shape of the Edge 540 120cc causes odd air pressures inside the cowling during flight. The engine baffling style we include and describe in the manual is required for proper engine cooling. **DO NOT use a traditional baffle setup, or engine overheating will occur.**

Seth's Pro Tips:

- I like to paint the baffles black to help clean up the appearance from the front of the cowling. If you wish to do the same, paint them before installing on the motor box or in the cowling, and be sure to let them fully dry before proceeding.
- We've found this baffling style helps the engine generate more power and run significantly cooler. Most importantly, pay close attention to how tight the baffling fits together, including the front pieces mounted in the cowling, and the rear pieces mounted to the motor box. The better they are sealed, the better your engine performance will be. Patience on these steps is key.

☐ 1. Locate the engine baffles. These are designed to fit the DA-120, and they are labeled according to their locations. If you are using a different engine, you can use these as a starting point to modify to fit your engine, or to use as a template to create baffles that specifically fit your needs. **Please note, the lettering should face the outside of the baffles when assembled.**
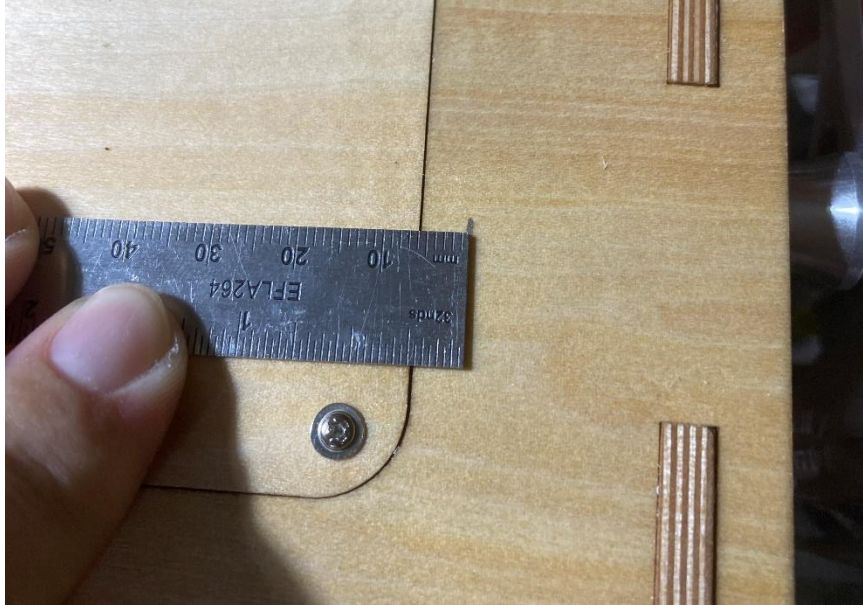
☐ 2. Using a ruler and a pencil, place a mark on each side of the motor box approximately ¼-inch (6mm) forward of the motor box top hatch. This will align the rear baffle.
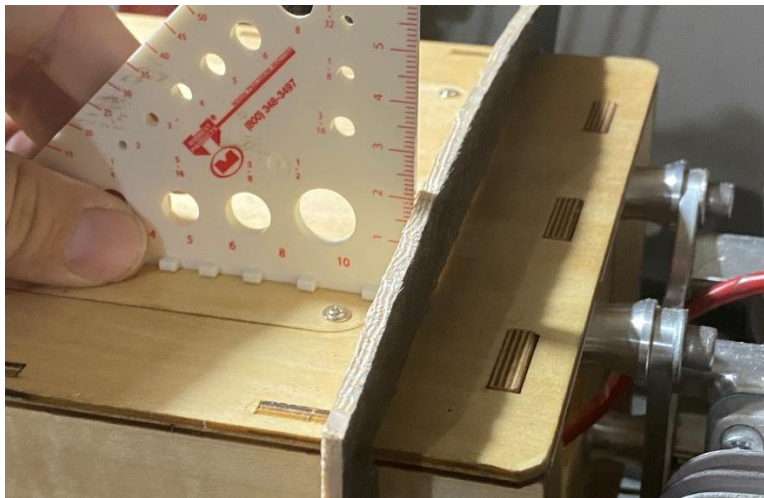
☐ 3. Test fit the rear baffle on the motor box, aligning the rear edge of the baffle with the marks made in the previous step. Modify the baffle as needed. Once satisfied with the fitment, use thin CA to tack the rear baffle in place, being sure to keep it square with the top of the motor box.

☐ 4. Test fit the rear right side and rear right bottom baffles in place. Once satisfied with their fitment, use thin CA to tack them in place. Note that the rear bottom baffles do angle down slightly as they get closer to the nose of the aircraft. Repeat this for the left side baffles.

☐ 5. Once the CA has cured, test fit the cowling onto the fuselage. Some adjustments to the top edges of the baffling will be needed to fit the cowling properly. Be sure to remove just enough material to get the cowling in place. Removing too much material can cause the baffling to work inadequately. Once you can fit the cowling on to the fuselage, proceed to the next step.

☐ 6. Test fit the front bottom baffle into the front of the cowling. Use medium grit sandpaper to adjust the front edges as needed. Once happy with the fitment, use thin CA to lightly tack the front bottom baffle in place near the spinner location only.

☐ 7. Once the CA has cured, slide the cowling in place, and note where the front lower baffle aligns relative to the rear lower baffles. These two should align with each other, only with a small gap for the spark plug caps. Adjust the front baffle angle so that it aligns with the rear lower baffles, and tack the corners in place with thin CA.
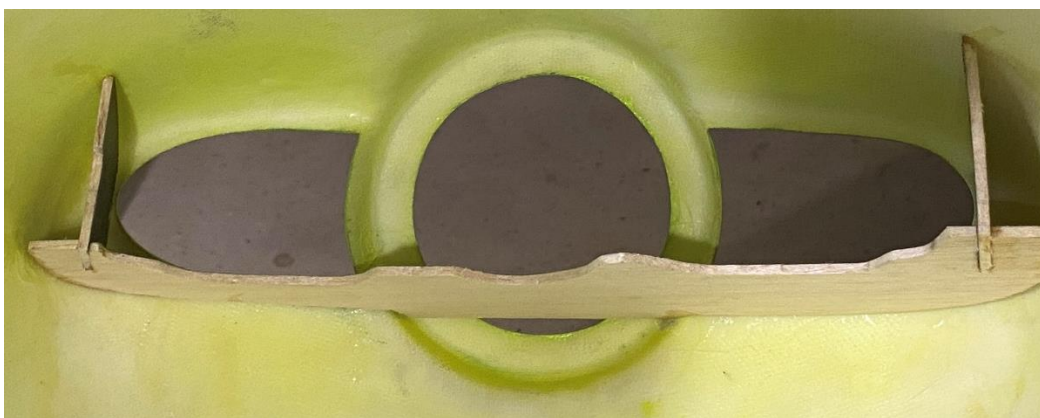
☐ 8.   Test fit the front side baffles in place. Make any adjustments as needed until you are satisfied with the fitment. Once satisfied with the fitment, test fit the cowling to check the alignment of the front side baffles with the rear side baffles. Once satisfied with the fitment, apply thin CA to the corner of the front side and front bottom baffles and remove the cowling. Use 15-minute epoxy to finish securing all of the baffles in place.

COWLING, PROPELLER AND SPINNER FINAL INSTALLATION

Required for this section

Components	**Tools**	**Adhesives/Building Materials**
○ Fuselage Assembly	○ M3 Hex Driver	○ Blue Threadlock
○ Cowling	○ M2 Hex Driver (Spinner)	
○ Propeller		
○ Spinner		
○ (2) M4 x 16 SHCS		
○ (1) M4 x 25 SHCS		
○ (3) M4 Washer		

☐ 1. Install the cowling onto the fuselage. Note that it must remain low until it reaches the "L" shaped hooks on the bottom side of the fuselage against the front former before it can be raised flush with the top of the fuselage. Use (2) M4 x 16 socket head cap screws, (2) flat washers and blue thread lock through the fuselage to secure the top of the cowling in place. Use (1) M4 x 25 socket head cap screw and (1) M4 washer to secure the bottom side of the cowling in place.

☐ 2. Once the cowling is in place, drill and install your propeller and spinner. We recommend the Falcon 28 x 9.5 propeller and our 5-inch "Ultimate-style" spinner for the perfect match to the DA-120 on stock mufflers with the Edge 540 120cc.

RUDDER SERVO AND CONTROL HORN INSTALLATION

Required for this section

Components	Tools	Adhesives/Building Materials
o Rudder Control Horns (4) o Rudder Control Horn Base Plates (2) o Fuselage Assembly	o Hobby Knife with a #11 blade	o Isopropyl Alcohol o 15-minute Epoxy o Mixing Cups o Mixing Sticks o Paper Towels

SELECTING YOUR RUDDER SERVO LOCATION
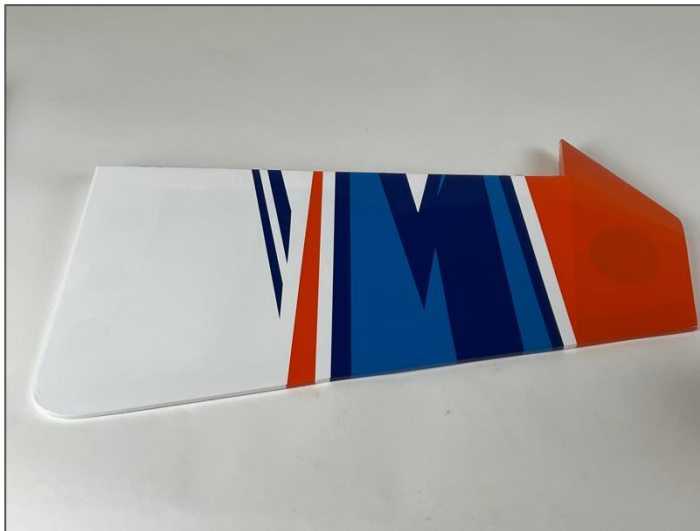
☐ 1. This model can use two different rudder setups depending on the CG position based on your equipment selection. You can mount the rudder servo in the tail of the fuselage for a push-pull setup (preferred) or up front under the canopy with a pull-pull setup. We recommend checking the CG before the final installation of the rudder servo and control horn to decide its final placement.
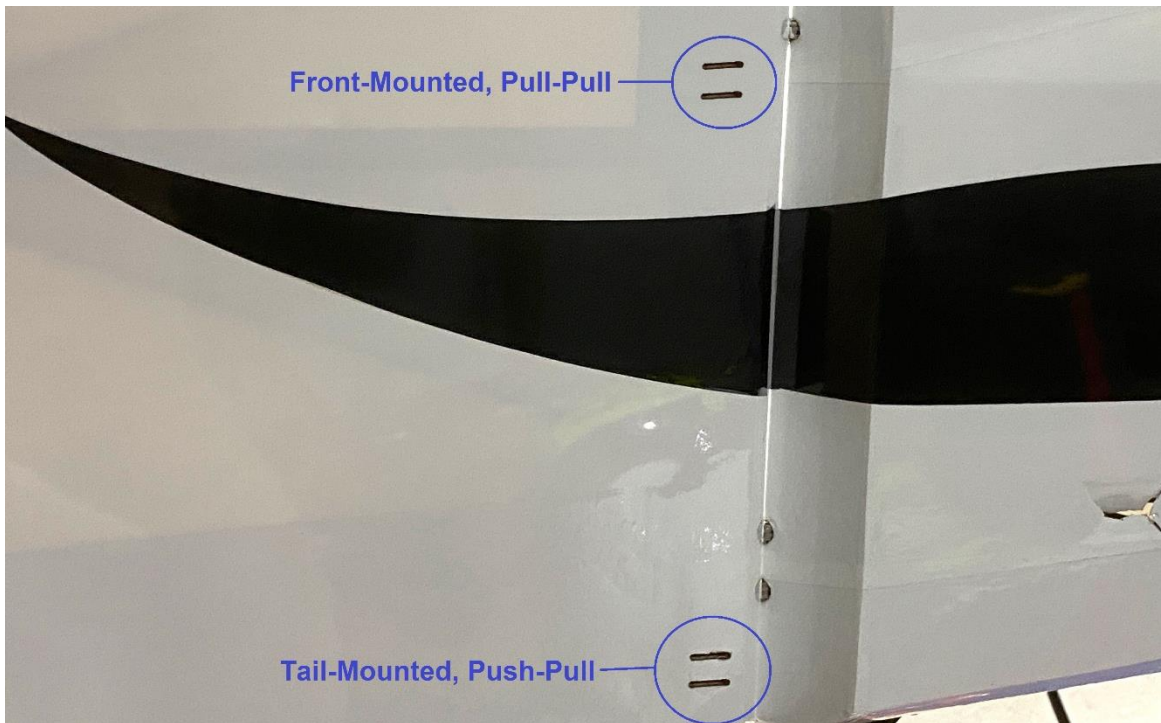
☐ 2.   Select your rudder servo position and its corresponding control horn position. If using a push-pull tail mounted rudder servo, remove the covering from the control horn slots at the bottom of the rudder, <u>but only on one side</u>. If using a pull-pull rudder servo, remove the covering from the control horn slots near the middle of the rudder on <u>both</u> sides.

☐ 3.   With the aircraft on its side on your work bench, test fit the control horns into their corresponding slots in the rudder. Once satisfied with the fit, mix an adequate amount of 15-minute epoxy, and secure the control horns in place following the same steps used for the elevator and rudder control horns. Note that there is no difference in rudder control horns for pull-pull or push-pull, only their location varies. If using a pull-pull setup, flip the fuselage over and repeat the process to glue the other control horns in on the other side.

4. If you are using a tail-mounted push-pull rudder setup, locate the servo pocket in the fuselage under the horizontal stabilizer. Use a #11 hobby knife to open the slot, then use a covering iron to seal the covering into the slot. Do not cut the covering flush with the edges, as you may risk the covering peeling up from airflow during flight.

5. Thread a servo mounting screw into each of the pre-cut holes in your selected mounting location. Remove the screw and apply thin CA to harden the threads cut by the screw. Let the CA fully cure before moving forward.

6. Insert the rudder servo into the rudder mounting location of your choice, being sure to route the servo extension appropriately, and orient the servo so that the output shaft is toward the rudder. Mount the servo using the screws provided with your servo.

7. Center the servo using your radio system. Install the servo arm so that is perpendicular to the servo case. Apply a small drop of blue thread lock onto the servo arm screw and secure it in place. If you are using a servo arm with clamping screws, apply a drop of blue thread lock and secure them in place.
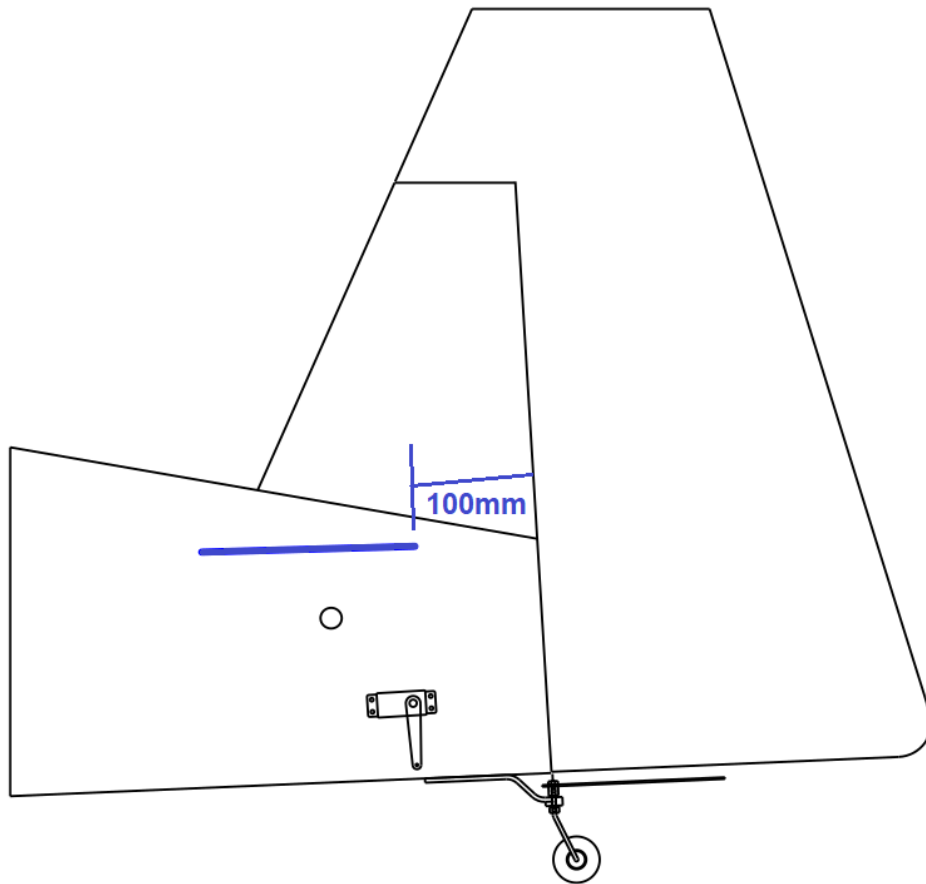
☐ 8. If you are using a pull-pull setup, locate the pull-pull cable exit holes in the rear of the fuselage. They begin approximately 3-15/16 inches (100mm) from the rudder hinge line and extend forward approximately 2-15/16 inches (75mm) from that point. Remove the covering from these areas, making sure it is still sealed well to the fuselage.

Seth's Pro Tip:

Use a soldering iron with a fine tip to open holes in the covering for things like the pull-pull wire exits in the fuselage. Not only does this remove the covering, but it also seals it to the edges of the hole.

☐ 9. Assemble your specific linkages as necessary.

Push-Pull:

If you are using a tail-mounted servo, use a turnbuckle of 3-7/8 in (100mm) in length, and thread a ball link onto each end approximately halfway. **Mount the ball link to the bottom side of the rudder servo arm (the side closest to the servo) in the 2-inch (51mm) hole location.** On the servo arm side, the order of components is as follows:

- o M3x15 Socket Head Cap Screw
- o M3 Washer
- o Servo Arm
- o Ball Link
- o M3 Washer
- o M3 Lock Nut

Mount the other end of the linkage to the control horn in the order noted below:
- o M3 x 12 Socket Head Cap Screw
- o M3 Washer
- o Ball Link (with rigging coupler)
- o Servo Arm
- o M3 Washer
- o M3 Lock Nut

With the radio powered on, adjust the linkage length to center the servo.

Pull-Pull:

Using pliers, thread a rigging coupler approximately halfway into four ball links. On two of the four ball links, take a section of pull-pull cable and route it through a small piece of heat shrink tubing, followed by a cable crimp. Then route the cable through the rigging coupler and back through the crimp. For extra security, you can loop the cable around the crimp a final time. Slide the crimp tight against the coupler and use a crimping tool to permanently attach the cable. Apply a small amount of thin CA to aid in securing the cable and crimp. Once secure, slide the heat shrink tubing back over the cable and crimp, and shrink it in place. The shrink tubing is only used to keep the cables looking neat and prevent the wire from snagging on any objects. Repeat this process for the second cable.
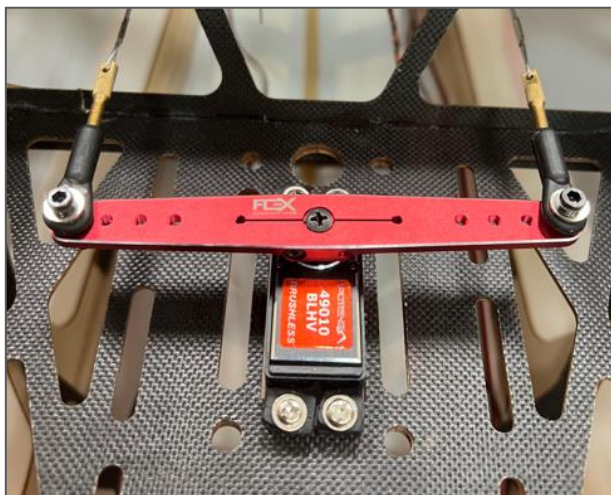
Attach a ball link and rigging coupler assembly to each side of the rudder servo arm at the 2-inch hole location from the center of the arm. The order of hardware is as follows:

- o   M3x15 Socket Head Cap Screw
- o   M3 Washer
- o   Ball Link (with rigging coupler)
- o   Servo Arm
- o   M3 Washer
- o   M3 Lock Nut

Attach the remaining ball links and rigging coupler to each side of the rudder control horn. The order of hardware is as follows:

- o   M3x15 Socket Head Cap Screw
- o   M3 Washer
- o   Fiberglass Control Horn #1
- o   Ball Link
- o   Fiberglass Control Horn #2
- o   M3 Washer
- o   M3 Lock Nut

Route the pull-pull cables through the fuselage, being sure to keep them from tangling with any formers or other structure in the aircraft. The cables should remain straight and should not cross before they exit the fuselage. Route the cables through a piece of heat shrink and through a crimp before routing them through the rigging coupler. Route the cable back through the crimp and get the cables as tight as possible with the rudder centered before crimping the cables. Crimp the cables and secure the heat shrink as desired. Trim any excess cable.

To tighten the pull-pull cables, remove a ball link from the control horn and thread the rigging coupler deeper into the ball link. For your initial flights, you'll want to set the tension tight, as they will loosen in the first several flights.

Seth's Pro Tip:

If using a pull-pull setup, you can hang the pull-pull cable from a tall shelf or high ceiling with some weight (approximately 5 pounds, or 2.3kg) hanging at the bottom of the wire for several days. This will pre-stretch the cable and minimize the amount of stretching that occurs in the first several flights. Alternatively, you can simply re-tension the pull-pull cables every 2-3 flights for the first 20 flights or so until the stretching begins to stop.
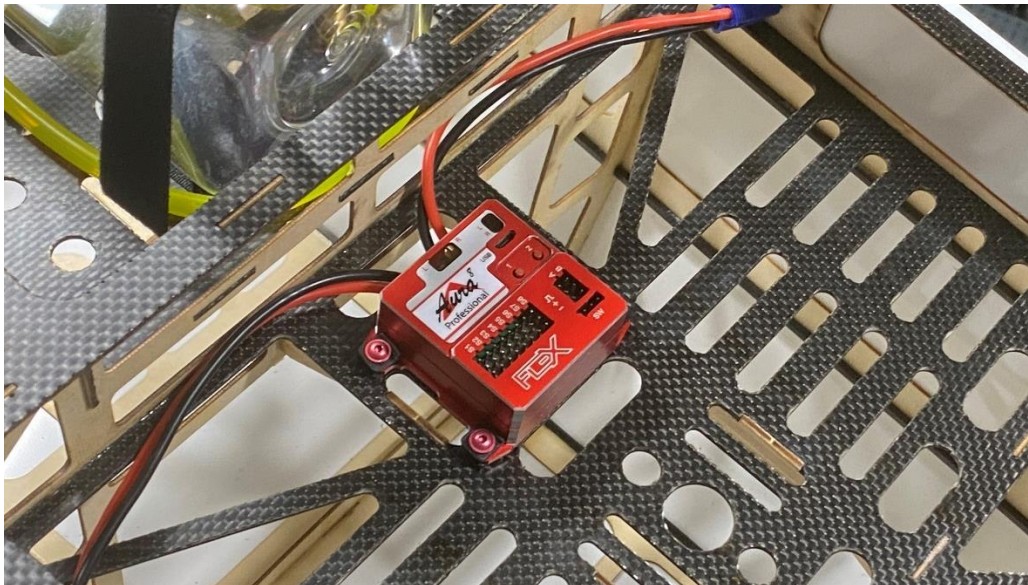
RADIO INSTALLATION

Required for this section

Components	Tools	Adhesives/Building Materials
o Fuselage Assembly o Receiver o Receiver Switch o Aura 8 or 12 Professional (Optional) o Receiver Batteries o Hook and Loop Straps o Adhesive-Backed Hook and Loop Tape o Tie-Wraps	o #1 Phillips Screwdriver o Hobby Knife with #11 Blade	

☐ 1. If you are using the Aura 8 or 12 Professional AFCS, it should be mounted forward of the rudder servo location in the center of the fuselage as shown in picture above. The Aura program (for the Edge 540 120cc can be found in the Aura Config Tool Windows application.

☐ 2. Use a #1 Phillips screwdriver to thread an Aura mounting screw into each of the pre-cut holes in the mounting tray. Remove the screw and apply a small amount of thin CA to each of the holes to harden the threads cut by the screw. Let the CA fully cure before mounting the Aura and securing the (4) screws.

3. Locate the RX/Aura switch just under the canopy. Note that there are switch locations on both sides of the fuselage. Remove the covering from the hole of your choice using a hobby knife with a #11 blade and install your RX switch. Use blue thread lock if your switch uses screws with metal-to-metal contact. DO NOT use thread lock if your screws thread into plastic!
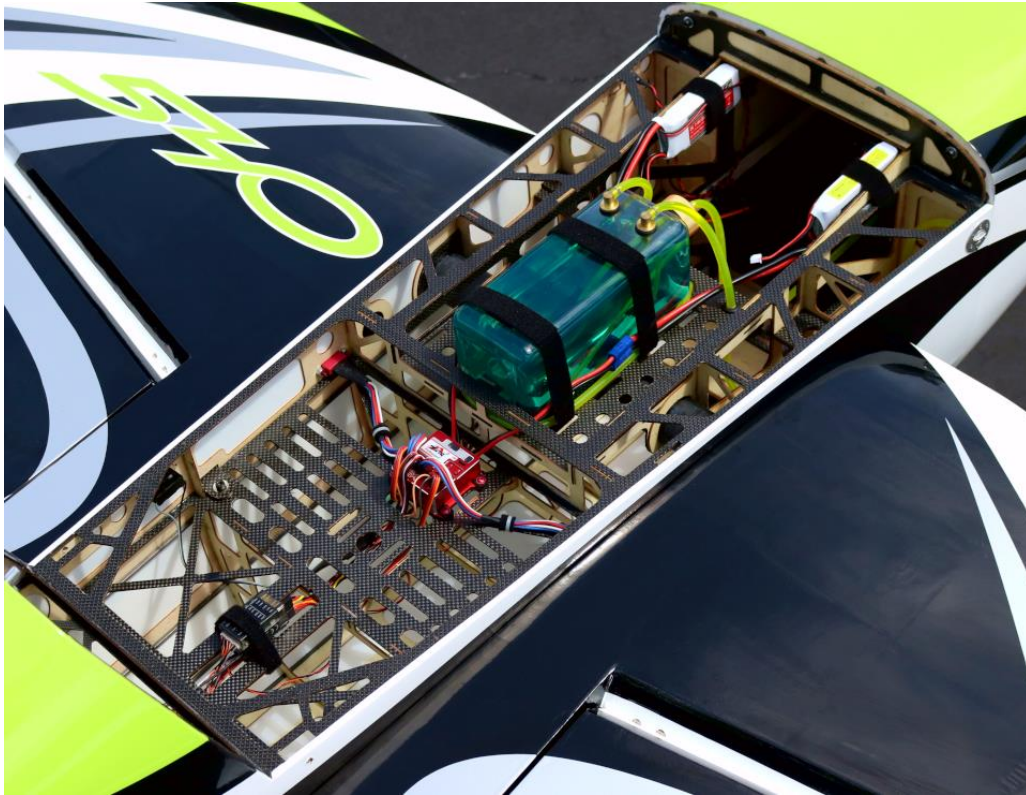
☐ 4.   Make all the necessary servo connections. Depending on the center of gravity (see the CG section), install your (2) receiver batteries in one of three mounting locations provided in the Edge. They are located as follows:

- o   Receiver & Rudder Servo Tray

- o   Just forward of the fuel tank tray along the sides of the motor box

- o   Inside the motor box on the bottom surface of the motor box

- o   Of course, batteries can be mounted virtually anywhere you can strap them in.

Use adhesive-backed hook and loop tape and a hook and loop strap to secure each battery in place.

☐ 5.   Place your receivers in the appropriate area according to your receiver's instruction manual. Note that the carbon structure in the fuselage can cause issues with signal, so route your antennas appropriately.

SFG ASSEMBLY

Required for this section

Components	Tools	Adhesives/Building Materials
o SFGs (2)		o Thin CA
o SFG Spacers (2)		o CA accelerator (optional)

☐ 1.   Align an SFG spacer with the SFG and apply a small amount thin CA around the joint to hold the spacer in place to the SFG. This will assist in the field assembly.

☐ 2.   Repeat this for the other SFG.

FIELD ASSEMBLY

Required for this section

Components	Tools	Adhesives/Building Materials
o Fuselage Assembly	o 3mm Hex Driver	
o Main Wings (2)	o 2.5mm Hex Driver	
o Main Wing Tube		
o Horizontal Stabilizers (2)		
o Horizontal Stabilizer Tube		
o SFG Assembly (2)		
o (4) M4 x 12 SHCS		
o (4) M4 washers		
o (4) M3 x 15 SHCS		
o (4) M3 x 25 SHCS		
o (8) M3 washer with 12mm outside diameter		

☐ 1. Slide the horizontal stabilizer tube through the fuselage and locate it approximately center. Partially slide a horizontal stab onto the horizontal stab tube and secure the servo lead as needed. Fully seat the horizontal stabilizer in place, being sure to avoid pinching any wiring between the horizontal stabilizer and fuselage. Secure the horizontal stabilizer with two M3 x 15 socket head cap screws and two M3 washers with a 12mm outside diameter. Repeat the process for the other side.

2. Use a 3mm hex driver to remove the canopy screws and remove the canopy from the fuselage. Slide the main wing tube through the fuselage and locate it approximately center. Partially slide the wing onto the wing tube, and secure the servo leads as needed. Fully seat the wing into place, being sure not to pinch any wiring between the wing and fuselage. Secure the wing with two M4 x 15 socket head cap screws and two M4 washers. Repeat for the other main wing.

3. Place an SFG at the wing tip with the SFG spacer towards the wing. Use two M3 x 25 socket head cap screws and two M3 washers with a 12mm outside diameter to secure the SFG in place. Repeat for the other SFG.

DECAL INSTALLATION

A traditional set of decals is provided with the Edge 540 120cc.

However, if you want the very best finished appearance, we recommend the Premium Vinyl Graphics Kit made by Callie Graphics and sold by Flex Innovations. The part numbers are listed in the optional parts table.

Use the drawings provided below for a guide to apply the decals to your model.

- [ ] 1. Thoroughly clean the model to ensure it is free of oil, fingerprints, and dust.

- [ ] 2. Separate the decals, but do not remove the paper backing.

- [ ] 3. Prepare a dishpan or small bucket with a mixture of warm water and liquid dish detergent. The ratio should be approximately one teaspoon per gallon of water.

- [ ] 4. Submerse the decal into the water/soap mixture and gently remove the paper backing. Removing the backing under water prevents fingerprints from being visible on the back side of the decal

- [ ] 5. Apply some water/soap mixture with your palm to the area desired. Once the area is saturated, position the sticker on the airplane. Even though these are not water transfer decals, using wet application methods allows the sticker to be repositioned, reduces bubbles, and eliminates fingerprints and other blemishes from being visible.

- [ ] 6. Hold the decal in place and use a paper towel to gently wipe most of the water away.

- [ ] 7. Use a soft piece of balsa or something similar to squeegee out the remaining liquid from underneath the decal.

- [ ] 8. Repeat the process until all decals are applied. Do not move, or otherwise touch the model for at least 24 hours to allow adequate time for the remaining water to evaporate.
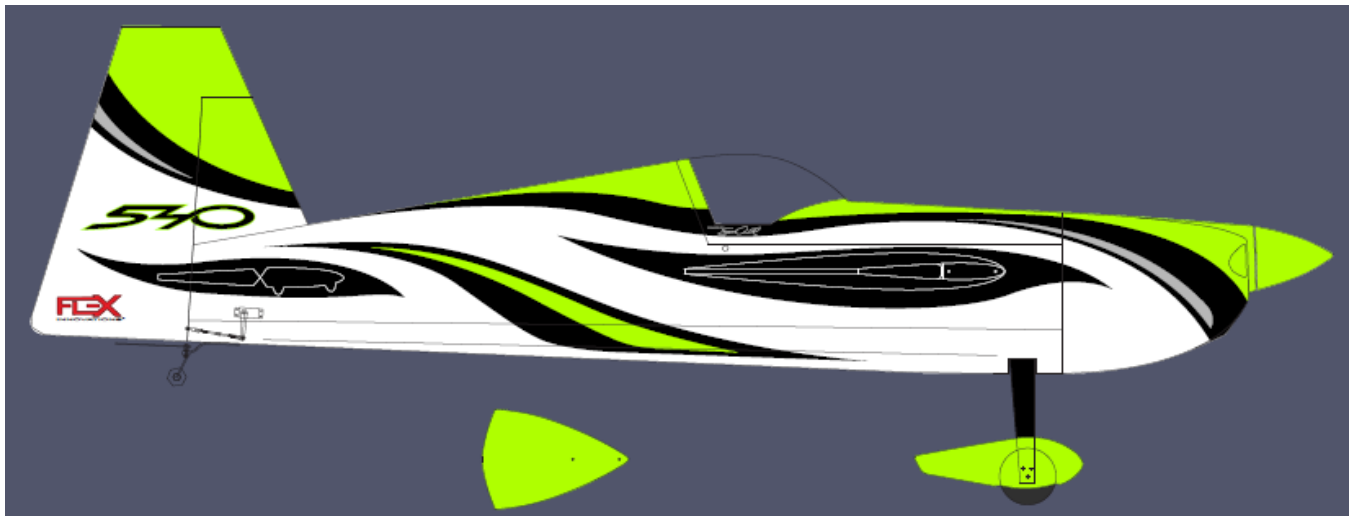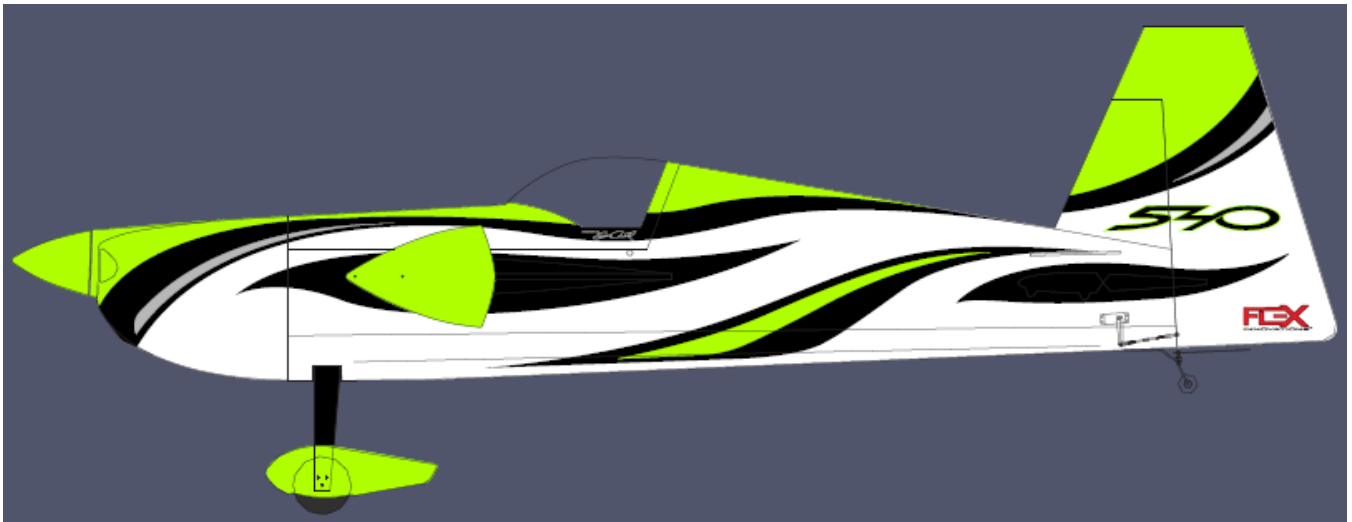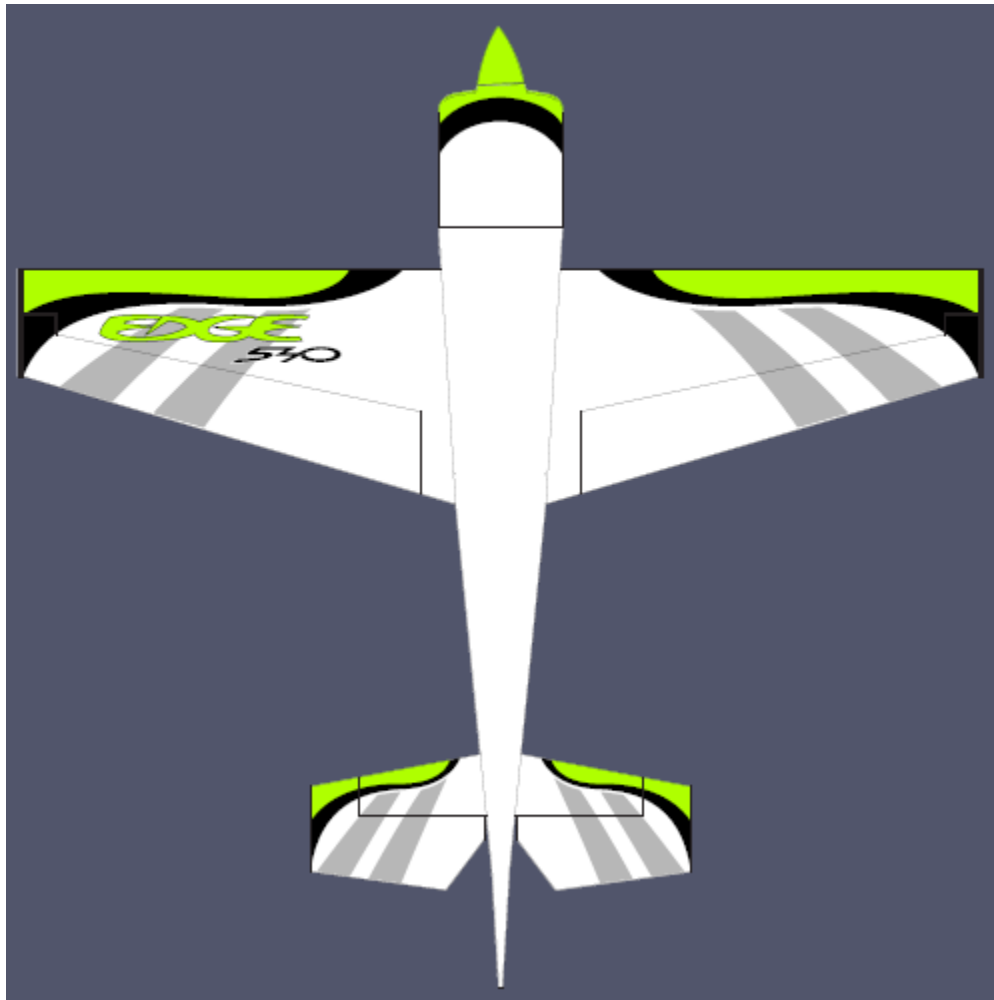
FINAL SETUP AND FLYING NOTES

CENTER OF GRAVITY

The Flex Innovations Edge 540 120cc is a high-performance airplane with large control surface throws, and a very high thrust to weight ratio. These factors make the Edge a very enjoyable aircraft to fly, but if the center of gravity is not within an acceptable range, it will make the airplane difficult or impossible, to control.

Before checking the CG of your model please ensure that all the components are installed in your airplane. This means the batteries, servos, linkages, hardware, propeller, spinner, hatches; everything. The airplane must be in ready-to-fly condition (without fuel), otherwise the measurement will not be accurate.

There are several methods for determining center of gravity, from using a CG machine, to using fingers and a friend. Regardless of the method used, ensure that the tests are accurate and repeatable. If there are any inconsistencies between measurements, work to isolate the source of the error(s) making sure that the test can be repeated with the same results.

The location of the center of gravity for the Edge 540 120cc is 6-9/16-inches (167mm) AFT from the LEADING EDGE of the WING. This measurement is determined from many test flights by designer and XFC champion, Seth Arnold.

6-9/16-inches
167mm
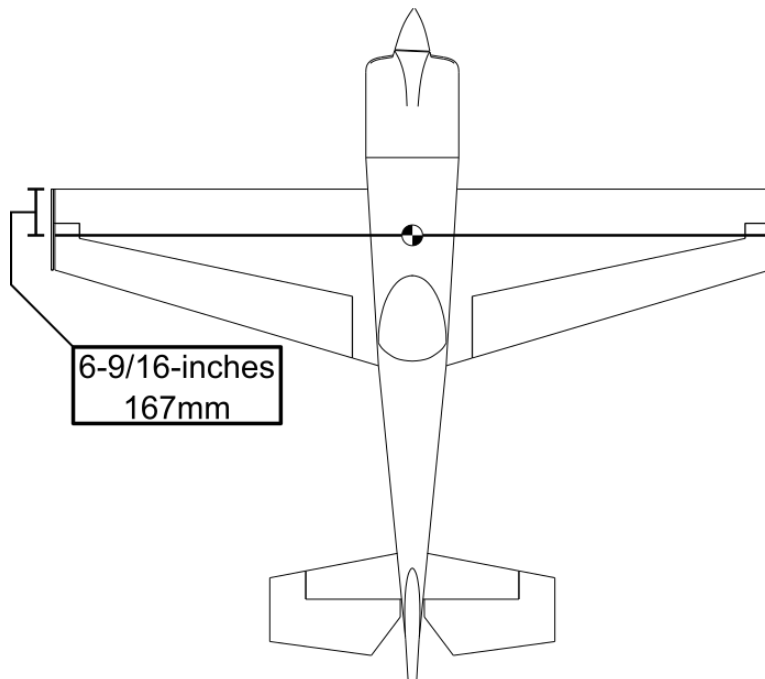
Seth's Pro Tip:

- o The measurement noted is the best CG location for flying the Edge, and where all tweaks to the airframe have been made. The aircraft is safe to fly within the range of 6-inches (153mm) to 6-23/32-inches (171mm) when measured from the leading edge of the wing but may not be flying at its optimized location.

AURA 8 PROFESSIONAL

If you choose to use Aura 8 Professional AFCS, you can find the Edge 540 120cc Aura setup in the Aura Config Tool by going to File > New Aura Config File Wizard.

STARTING CONTROL SURFACE THROWS AND EXPONETIAL

The following throws and exponential have been tested thoroughly during the development of the airplane and have been determined to be the optimal starting point for the Ultimate 70cc. As you become more familiar with the airplane, you may tweak the rates and expos to better suit your flying style, but these numbers provide a very good starting point.

NOTE: Aileron throws are measured at the trailing edge and root of the aileron. Elevator and rudder throws are measured at counterbalance, from the center of the fin or stab to the center of the counterbalance. Since expo directions vary by transmitter manufacturer, all expos listed below are those that make the control feel softer around the stick's center position.

Edge 540 120cc Control Throws and Expo

	Low Rate		High Rate	
	Up	**Down**	**Up**	**Down**
Aileron	92mm (3-5/8 in.)	92mm (3-5/8 in.)	140mm (5-1/2 in.)	140mm (5-1/2 in.)
Elevator	20mm (25/32 in.)	20mm (25/32 in.)	105mm (4-1/8 in.)	105mm (4-1/8 in.)
Rudder	40mm 1-9/16 in.)	40mm (1-9/16 in.)	Maximum Available	Maximum Available
Aileron Expo	35%	35%	55%	55%
Elevator Expo	25%	25%	50%	50%
Rudder Expo	25%	25%	50%	50%

Seth's Pro Tips:

- High rate should be reserved for 3D aerobatics
- The low rate noted in the chart above includes enough aileron throw to do snap rolls. If you are sensitive to the ailerons, you can reduce value to 73mm (2-7/8-inches) for the first flights until you can adjust to your personal tastes.
- For high rudder rate, increase the travel until the control horn nearly touches the fuselage, and be sure to match both directions.
- If you are looking for the maximum roll rate at high airspeeds, the high-rate aileron deflection noted above is too much drag and will actually slow the roll rate. I suggest using approximately 119mm (4-11/16-inches) for the fastest roll rate.

RANGE TESTING

Carefully follow the binding and range testing instructions included with your radio equipment. If there are any issues passing the test range, please consult your transmitter and receiver manuals or contact your transmitter and receiver manufacturer to determine the appropriate solution before attempting to fly.

BEFORE FIRST FLIGHT

Before going to the field for your first flight, please go over the finished, fully assembled model at home. The key to a successful first flight is preparation and ensuring that your plane is airworthy.

- ☐ 1.　For optimal performance of your model, balance your propeller and spinner. Most propellers are balanced fairly-well out of the package; however, some fine-tuning can make a mediocre propeller perform great. An out-of-balance propeller or spinner can wreak havoc on the electronic components in the airplane, as well as prematurely shorten the life span of the engine, servos or even the model itself. A balanced propeller will be quieter, generate more thrust, produce less vibration, and operate more efficiently than one that is not balanced.

- ☐ 2.　Re-check all linkages and connections, including those that may have been assembled by the factory. Ensure pushrods are sufficiently threaded into ball links, ensure that all metal-to-metal connections have thread lock applied and ensure that all control surfaces move freely and in their proper direction.

- ☐ 3.　Verify proper functioning, break-in, and operation of your engine choice. Ensure that the fuel-air mixture is correct, and that the engine is producing full power. If you are not familiar with gas engines, ask for the assistance of a more experienced pilot in your area or speak with your engine manufacturer.

- ☐ 4.　Secure any loose wiring inside the fuselage or wings in such a way that they do not rub or chafe.

- ☐ 5.　Ensure that all batteries (transmitter, receiver, ignition, or flight packs) are fully charged prior to leaving for the flying field.

- ☐ 6.　Take a few moments to assemble the airplane away from commotion, talkative onlookers, or any other distractions. Ensure that all connections are properly made and secured, the wing bolts are tight and take a few minutes to plan out your first flight.

- ☐ 7.　If your gas engine is new, avoid prolonged full throttle runs and vertical climbs. Limit the first few flights to a short flight time. Start off short, gradually lengthening the flight times as you become comfortable with the performance of your engine. Six minutes is a good time to limit your first flights to. As you become more familiar with the airplane and begin to fly it in a more aggressive manner, monitor the temperature of the engine and adjust the fuel-air mixture according to your engine manufacturer's recommendations.

AMA SAFETY CODE

When flying your aircraft, we recommend following the guidelines set by the Academy of Model Aeronautics (AMA). You can find their Safety handbook as well as more information on the AMA at their website, located at the address below.

https://www.modelaircraft.org/

REPLACEMENT PARTS

FPM1300A	Edge 540 120cc ARF, Green Scheme
FPM1300B	Edge 540 120cc ARF, Red Scheme
FPM1301A	Edge 540 120cc ARF Fuselage, Green Scheme
FPM1301B	Edge 540 120cc ARF Fuselage, Red Scheme
FPM1302LA	Edge 540 120cc ARF Left Wing, Green Scheme
FPM1302LB	Edge 540 120cc ARF Left Wing, Red Scheme
FPM1302RA	Edge 540 120cc ARF Right Wing, Green Scheme
FPM1302RB	Edge 540 120cc ARF Right Wing, Red Scheme
FPM1303A	Edge 540 120cc ARF Horizontal Stabilizer, Green Scheme
FPM1303B	Edge 540 120cc ARF Horizontal Stabilizer, Red Scheme
FPM1304A	Edge 540 120cc ARF Rudder, Green Scheme
FPM1304B	Edge 540 120cc ARF Rudder, Red Scheme
FPM1305A	Edge 540 120cc ARF Cowling, Green Scheme
FPM1305B	Edge 540 120cc ARF Cowling, Red Scheme
FPM1306A	Edge 540 120cc ARF Canopy Hatch, Green Scheme
FPM1306B	Edge 540 120cc ARF Canopy Hatch, Red Scheme
FPM1307	Edge 540 120cc ARF Carbon Fiber Landing Gear
FPM1308A	Edge 540 120cc ARF Wheel Pant Set, Green Scheme
FPM1308B	Edge 540 120cc ARF Wheel Pant Set, Red Scheme
FPM1309	Edge 540 120cc ARF Carbon Fiber Wing & Stab Tubes
FPM1312	Edge 540 120cc ARF Linkage and Control Horn Set
FPM1313	Edge 540 120cc ARF Hardware Set
FPM1315A	Edge 540 120cc ARF Decal Sheet, Green
FPM1315B	Edge 540 120cc ARF Decal Sheet, Red
FPM1321	Edge 540 120cc ARF Laser Cut Wood Parts
FPM1326	Edge 540 120cc ARF Engine Baffle Kit

OPTIONAL ACCESSORIES

FPM1314	Edge 540 120cc ARF Premium Wing Bag Set
FPM1327A	Edge 540 120cc ARF Pilot and Cockpit Set, Green Scheme
FPM1327B	Edge 540 120cc ARF Pilot and Cockpit Set, Red Scheme
FPMDA120	Desert Aircraft DA-120cc Engine
FPMDA120MUFLR	DA120 Muffler
FPMGP123	GP 123cc V2 Engine with Mufflers
FPM1024A	5-inch Carbon Fiber Spinner, Green
FPM1024B	5-inch Carbon Fiber Spinner, Red
FPMHOLYG2	Holy Smokes Gen 2 Smoke System
FPM1623	32oz Lightweight Fuel/Smoke Tank
FPMPFC2895CF	Falcon 28x9.5 Carbon Fiber Propeller
FPMPF27108GCF	Flex 27x10.8 Carbon Fiber Propeller
FPZA1036	Aluminum Servo Arm 2-in Clamping (25T)
FPZA1037	Aluminum Servo Arm 4-in Clamping (25T)
FPZA1040	Servo Connector Safety Clip
FPZAURA08PRO	Aura 8 Professional AFCS
FPZAURA12PRO	Aura 12 Professional AFCS
FPZBR20002S15	2000 mAh 2s 15C JR/EC3 Connector RX Li-Po Battery Pack
FPZDS49010BLHV	Potenza DS49010BLHV Brushless Servo
FPMAMCFUELER	McFueler Fuel Dot

LIMITED WARRANTY

WARRANTY COVERAGE

Flex Innovations LLC and its authorized resellers ("Flex") warrant to the original purchaser that this product (the "Product") will be free from defects in materials and workmanship at the date of purchase.

OUTSIDE OF COVERAGE

The warranty is not transferable and does not cover:

(a) Products with more than 45 days after the purchase date
(b) Damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation, or maintenance
(c) Damage to other components or assemblies associated with the use of the Product.
(d) Modification of or to any part of the Product
(e) Product not purchased from an authorized Flex Innovations dealer or distributor.
(f) Product that has been partially, or fully assembled
(g) Shipping damage
(h) Cosmetic damage
(i) Services or labor associated with the repair, use or assembly of the Product.

OTHER THAN THE EXPRESS WARRANTY ABOVE, FLEX MAKES NO OTHER WARRANTY REPRESENTATION, AND HEREBY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

PURCHASER'S REMEDY

Flex's sole obligation and purchaser's sole and exclusive remedy shall be that Flex will, at its option, either (i) service, (ii) replace any part of the Product determined by Flex to be defective, or (iii) replace the Product determined by Flex to be defective. Flex reserves the right to inspect all Product(s) involved in a warranty claim. Service or replacement decisions are at the sole discretion of Flex. Proof of purchase is required for all warranty claims. **SERVICE OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY.**

LIMITATION OF LIABILITY

FLEX SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF WAY, REGARDLESS OF WHETHER SUCH CLAIM IS BASED IN CONTRACT,

WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR ANY OTHER THEORY OF LIABILITY, EVEN IF FLEX HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Further, in no event shall the liability of Flex exceed the individual price of the Product on which liability is asserted. As Flex has no control over use, setup, assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage and/or injury. By the act of use, setup or assembly, the user accepts all resulting liability. If you as the purchaser or user are not prepared to accept the liability associated with the use of the Product, purchaser is advised to return the Product immediately in new and unused condition to the place of purchase.

LAW

These terms are governed by Florida law (without regard to conflict of law of principals). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. FLEX RESERVES THE RIGHT TO MODIFY THIS WARRANTY AT ANY TIME WITHOUT NOTICE.

QUESTIONS & ASSISTANCE

Contact us by:

E-Mail – support@flexinnovations.com

Phone – 1 (866) 310-3539

INSPECTION OR SERVICES

If this Product needs to be inspected or serviced and is compliant in the region you live and use the Product in, please contact your regional Flex authorized reseller. Pack the Product securely using the original shipping carton. Please note that both the inner and outer boxes need to be included. The inner box is not designed to withstand the rigors of shipping without additional protection from the outer shipping carton. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Flex is not responsible for merchandise until it arrives and is accepted at our facility.
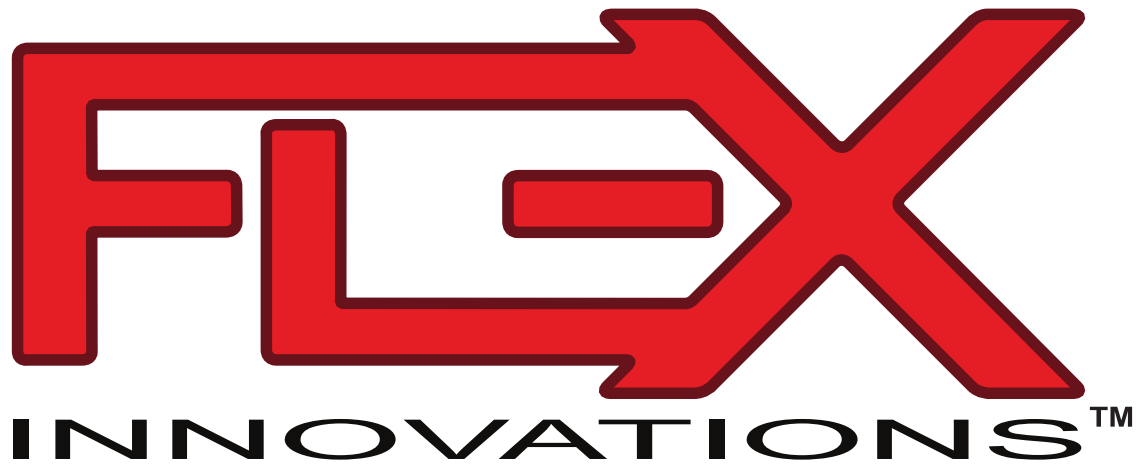
WARRANTY REQUIREMENTS

For Warranty consideration, you must include your original sales receipt verifying the proof of purchase date. Provided any warranty conditions have been met, your Product or its defective parts will be replaced or serviced free of charge. Responsibility of shipping charges are as follows:

To Flex from customer, customer is responsible.

To Customer from Flex, Flex is responsible.

Service or replacement decisions are at the sole discretion of Flex.

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