

Instruction Manual

ARF and ARFSV

MAVERICK



FLEX
INNOVATIONS™



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

<https://www.flexinnovations.com/product/mamba-70cc-g2/>

TABLE OF CONTENTS

Introduction.....	1
Specifications:	2
Required Equipment:	2
Optional Equipment:	3
Ultracote®/Oracover® Colors:.....	4
Using this Manual	5
ARF.....	8
Interplane Strut, Wing Strut Block Installation.....	8
Aileron Control Horn Installation	11
Control Horn Installation	11
Wing Servos and Linkages Installation	13
Ailerons.....	14
ARF and ARFSV	16
Installing the Horizontal Stabilizer.....	16
Elevator Installation	19
Control Horn Installation	20
Elevator Installation:	20
Elevator Servo and Linkage Installation	22
Rudder, Tailwheel Installation	25
Rudder Control Horn Installation.....	26
Rudder Installation	28
Tail Wheel Installation	29
Rudder Servo and Linkage Installation	30
Landing Gear Installation.....	33
Engine and Throttle Servo Installation.....	36
DA-70 Engine Installation	36
DA-70 Throttle Servo and Throttle Linkage Installation.....	37
Ignition Installation.....	39
Fuel Tank Installation.....	40
Exhaust and Cowling Installation	42
Muffler Installation (A)	43
Canister Installation (B).....	44
Baffle and Final Cowling Installation	45
Center Wing Cabane Installation.....	47
Final Assembly	50
Radio Installation.....	50
Field Assembly	53
Decal Installation	54

Final Setup and Flying Notes.....	56
Center of Gravity	56
Aura 8 Professional.....	57
Range Testing.....	57
Before First Flight	58
AMA Safety Code	58
Replacement Parts.....	59
Optional Accessories.....	60
Limited Warranty	61
Building and Flying Notes.....	63

INTRODUCTION



The Mamba 70 G1 was the first aircraft in the Mamba series and established the design philosophy that continues to define every Mamba that followed. Its lightweight feel, precise control authority, and predictable response across the entire flight envelope set a benchmark for what pilots expect from an aerobatic biplane—whether flying precision sequences, smooth sport aerobatics, or aggressive 3D maneuvers.

Based on the full-scale Model 12, the original Mamba 70 was developed into a dedicated R/C airframe through the collaboration of World Champion Quique Somenzini and Kevin Kimball of Jim Kimball Enterprises. This design later expanded into the Mamba family, which includes the Mamba 10, Mamba 60E, and Mamba 120—each carrying forward the same core design principles first introduced with the Mamba 70 G1.

With Flex Innovations' continued pursuit of the ultimate flying experience, the Mamba 70 G2 incorporates several updates for improved convenience and refinement while maintaining the proven airframe and flight characteristics pilots expect. These improvements include proprietary Flex Speed-Locks on the wings and canopy for faster assembly and transport, a fully installed cockpit, and an included fiberglass engine baffle. ARFSV and INSTAFly packages also include Flex DS49010BLHV servos for precise and reliable control.

These refinements modernize the aircraft while preserving the flight qualities that have made the Mamba series a favorite among aerobatic pilots. Enjoy it!

Specifications:

Wingspan:	77 in. (1961 mm)
Length:	79.5 in. (2020 mm)
Estimated Weight:	20lbs 13oz (9.44 kg) with DA70 with cannister muffler
Wing Area:	2070 sq. in. (133.5 sq. dm.)

Required Equipment:

Radio Equipment & Servos:

Transmitter:	8+ channels
Receiver:	8+ channels, high-voltage capable
Receiver Battery:	(2) 2S 2000mAh 15C+ LiPos (FPZBR20002S15 recommended)
Receiver Battery Strap:	Flex Hook and Loop Strap, 200 mm long (FPMA1012)
Aileron, Rudder, Elevators	(6) Minimum 400 oz/in (28 kg/cm)
Recommended servos:	Potenza DS494010HV brushless high voltage servo recommended

Servo Arms:

Aileron and Elevators:	(5) 1.25-inch Single Arm Potenza 1.25-inch Clamping Servo Arm (FPZA0005B) recommended
Rudder (pull-pull):	2.5-inch Double Arm Potenza 4-inch Clamping Servo Arm (FPZA1037) recommended
Rudder (push-pull):	1.25-inch Single Arm Potenza 1.25-inch Clamping Servo Arm (FPZA0005B) recommended

Servo Extensions:

Ailerons:	(2) 3-inch to MPX Bottom Wing (FPZA1042)
Ailerons:	(2) 30-inch (762 mm) Top Wing (FPZA1056)
(To RX or Aura)	(2) 12-inch to MPX (300 mm) Bottom Wing (FPZA1045)
Elevators:	18-inch (460 mm) (FPZA1046)
Rudder (push-pull)	18-inch (460 mm) (FPZA1046)
Servo Extension Safety Clips:	Flex Servo Connector Safety Clips (FPZA1040)

Spinner:

Spinner:	5 inch (127 mm) Recommended Flex Carbon-fiber Spinner (FPMA1027)
----------	---

Gas Engine Setup

Engine:	Desert Aircraft DA-70 – FPMDA70 recommended or Great Power GP76 – FPMGP76 recommended
Exhaust:	Follow your engine manufacturer's recommendation, as well as local noise restrictions in your area. DA stock muffler set by Slimline (FPMDA70MUFFLER) recommended for DA-70
Other Exhaust Options:	MTW TDH110 Rear Discharge Canisters for the DA-70 KS 40 mm drop 2 to 1 header for the DA-70
Propeller:	Follow your engine manufacturer's recommendation. Falcon 24x9 (FPMFPC2409) recommended for the DA-70
Engine Standoffs:	FPZMEMDA70H15 Flex Engine Mount 15mm Spacer for 70cc Engine
Throttle Servo:	High Quality, Metal Gear Digital Servo Potenza FPZDS19410HV servo recommended
Throttle Servo Extension:	18-inch (460 mm) (FPZA1046)
Ignition Regulator:	Follow your engine manufacturer's recommendation
Ignition Battery:	2S 2000mAh 15C+ Li-Po Potenza 2S 2000mAh 15C Li-Po (FPZBR20002S15) recommended
Ignition and RX Battery Strap:	Flex Hook and Loop Strap, 200 mm long (FPMA1012)
Fuel Tank Strap:	Flex Hook and Loop Strap, 400mm long (FPMA1055)
Fuel Dot:	McFueled Fuel Dot (FPMAMCFUELER)

Optional Equipment:

FPZAURA08PRO	Aura 8 Professional
FPM2019	24oz Lightweight Fuel/Smoke Tank (for smoke)
DP1000	DualSky DP1000 Smoke Pump
FPM357018	(2) Premium Wing Bag – RV-8 60E & Mamba 70cc
FPM2124	Mamba 70cc Pilot
FPMA1079	5-in Parabolic Carbon spinner Checker-Board black and white

Ultracote®/Oracover® Colors:

Ultracote®

True Red (HANU866)

White (HANU870)

Silver (HANU881)

Black (HANU874)

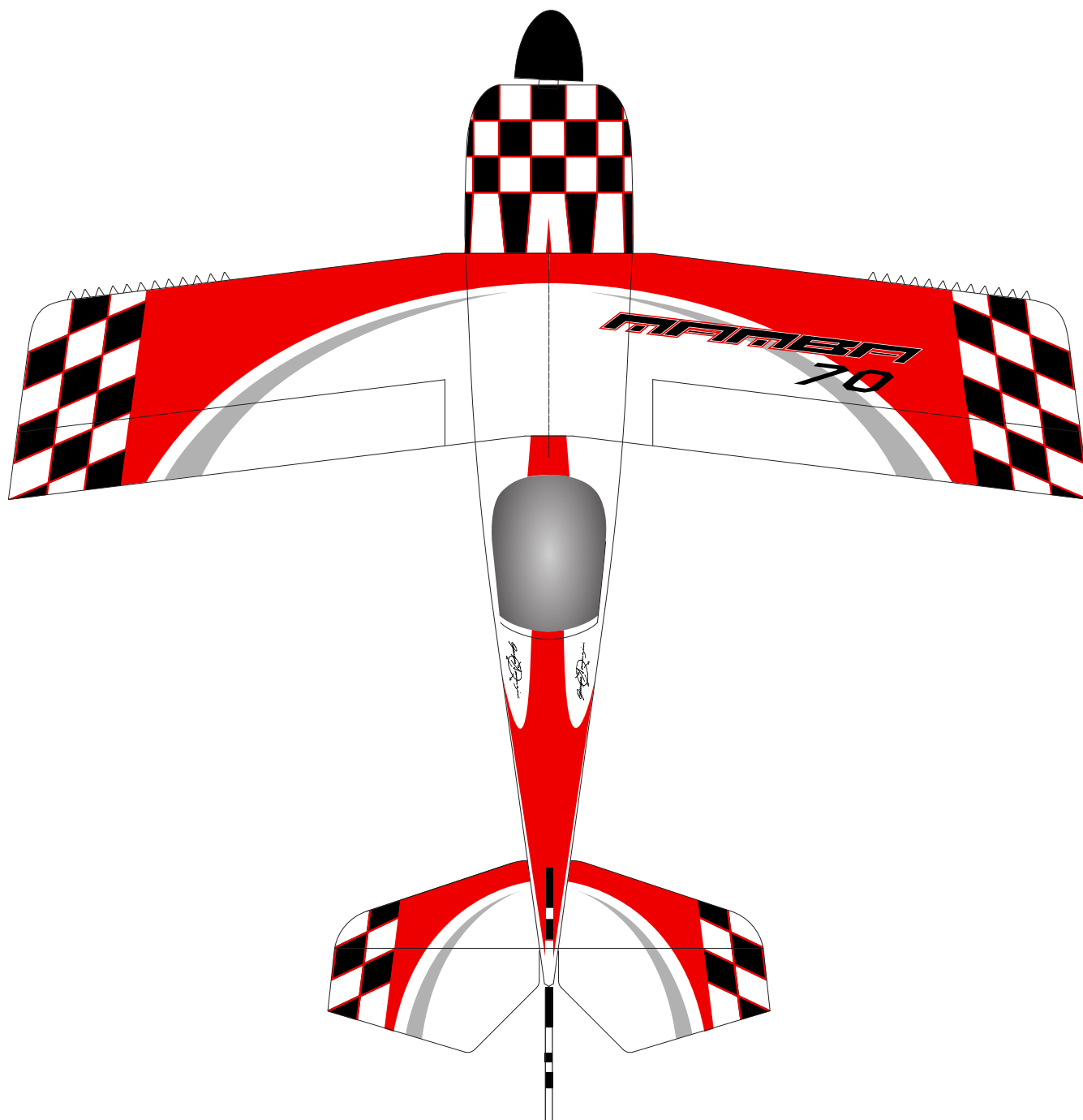
Oracover®

Ferrari Red (21-023)

White (21-010)

Silver (21-091)

Black (21-071)



USING THIS MANUAL

This manual is for both the ARF and ARFSV versions.

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

If you have an ARFSV, some of the steps will be completed for you, however, it is important that you read through this entire instruction manual to familiarize yourself with this aircraft.

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. 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.

- 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.
- Your aircraft has experienced many changes in temperature, density, etc. Throughout its transit from the factory, warehouse, and finally to your location. It is expected that some areas of covering will show wrinkles
- Use a covering iron with a sock on high heat to carefully iron down the entire airplane. Pay special attention to the leading edges, hinge lines, stabilizers, fuselage, and wing saddle areas.
 - This step is critical not only for the appearance of the airplane, but most important to prevent the clear top layer of the film from peeling.
 - **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.
- 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.
- 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
- To prepare for flight, it is recommended that you use the combination of an iron and heat gun to ensure all seams are sealed. Be sure to operate with safe heat settings on your iron

while using an iron cover or paper towel. When using a heat gun, do not concentrate on one area for an extended period, rather distribute the heat

- Glass cleaner and paper towels work well to clean your airframe. For an additional shine, spray wax, after all decals have been applied, is an option.
- It is a good idea to have some isopropyl alcohol on hand throughout assembly. This can be used to help clean residual adhesives.

ARF

If your airplane is the ARF version start building from this page through the end of this manual.

INTERPLANE STRUT, WING STRUT BLOCK INSTALLATION

Required for this section

Components

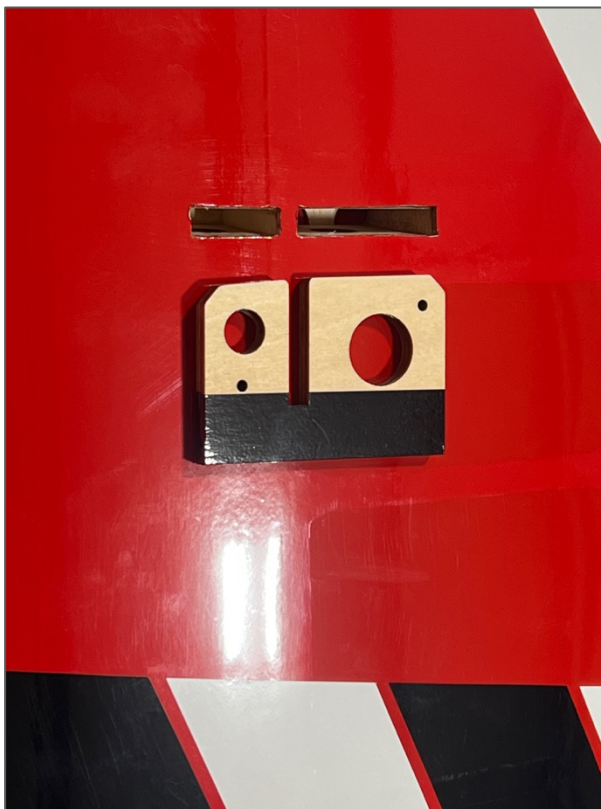
- Top Wing Panels (2)
- Bottom Wing Panels (2)
- Interplane Strut Blocks (4)
- Interplane Struts (2)
- Interplane Strut Pins (4)

Tools

- Covering Iron/Trim Iron

Adhesives/Building Materials

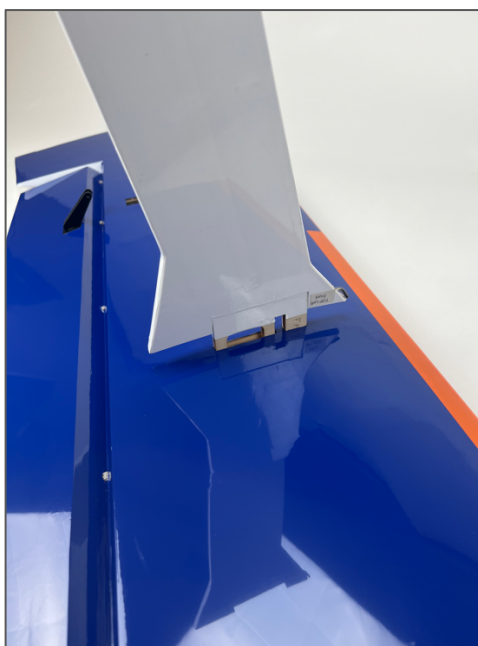
- Isopropyl Alcohol
- 30-minute Epoxy
- Paper Towels
- Toothpicks
- Mixing Cups
- Mixing Sticks (something to mix epoxy with)
- Low Tack Tape



- ☐ 1. Locate the slots in the wing for the interplane strut block locations. These are located in the top of the bottom wings, and the bottom of the top wings. Each block is clearly labeled. When installing it, follow the labeled directions.



- ☐ 2. Take an interplane strut and assemble the corresponding block in position using the 3mm pin.



- ☐ 3. Do a test fit to confirm strut and block are in the correct location and fit with no issues into the slot in the wing.



- ☐ 4. Once the fit is OK and you are ready to bond the blocks in, apply some low-tack tape around slot to ease epoxy cleanup. Use good quality, 30-minute Epoxy to bond the blocks in. Repeat this procedure for all 4 blocks.



- ☐ 5. Clean-up any epoxy squeeze-out using Isopropyl Alcohol

Quique's Tip:

While you are testing these parts, check that the pin fits tight and is not loose. Pin should fit tight and might need the use of plyers to install and/or remove. If it is too loose, apply a thin layer of CA adhesive to the strut. **DO NOT USE ACCELERATOR** on the CA, let it cure naturally. If it is too tight, there may be some glue residue in the strut, clear it out with the pin or a small drill bit. Keep this tip in mind for future use, as the airplane accumulates flights it may be necessary to repeat this step.

AILERON CONTROL HORN INSTALLATION

Required for this section

Components

- Top Wing Panels (2)
- Bottom Wing Panels (2)
- Aileron Control Horns (8)
- Aileron Control Horn Base Plates (4)
- Aileron hinges (20)

Tools

- Hobby Knife with a #11 blade

Adhesives/Building Materials

- Isopropyl Alcohol
- 30-minute Epoxy
- Petroleum Jelly
- Paper Towels
- Toothpicks
- Mixing Cups
- Mixing Sticks (something to mix epoxy with)

Control Horn Installation



- ☐ 1. Prepare the control horns by scuffing the portion of the control horn that is inserted into the control surface with medium grit sandpaper. Use isopropyl alcohol and a paper towel to clean the control horn and remove any debris left over after scuffing.



- ☐ 2. Locate the aileron control horn slots. Test fit the control horns and mark around the plate to remove the covering.



- ☐ 3. Use a Hobby Knife with a #11 blade to remove the covering for the control horn plate as shown in the picture above.



- ☐ 4. Mix an adequate amount of 30-minute epoxy. Apply epoxy to the slot in the control surface as well as the control horns. Install the control horn and check for proper alignment. Use isopropyl alcohol and a paper towel to clean up any excess epoxy before it cures. Let it sit until the epoxy cures.

Quique's Tip:

To ensure proper alignment of each control horn, you can secure the ball link to the horns and then glue the horn in place with the ball link attached. This will ensure even alignment of both control horns.

WING SERVOS AND LINKAGES INSTALLATION

Required for this section

Components

- Top Wing Panels (2)
- Bottom Wing Panels (2)
- Aileron Linkage (4)
- Aileron Servos (4)
- Aileron Servo Arms (4)
- Bottom Wing Aileron servo extensions (2)
- Ball Links (8)
- M3 x 15 Socket Head Cap Screw (8)
- M3 Washer (16)
- M3 Lock Nut (8)

Tools

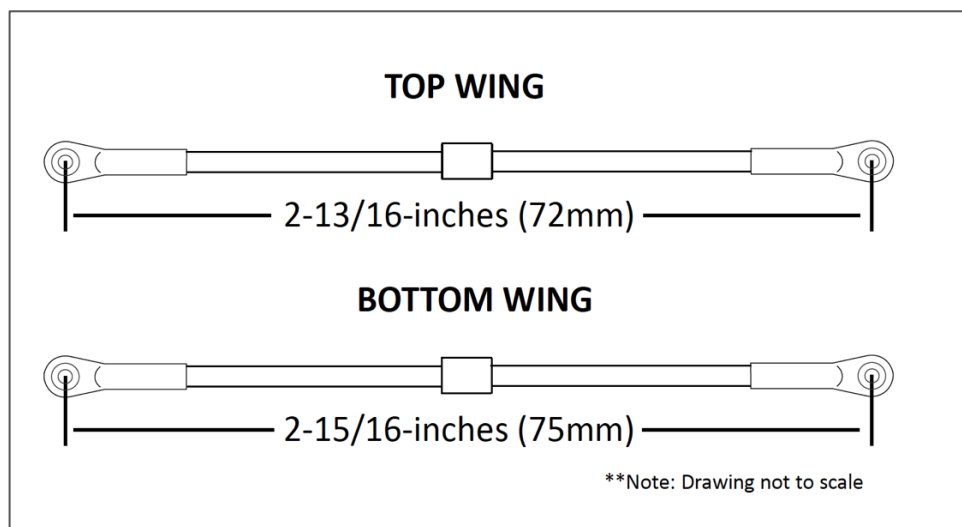
- #1 Phillips Screwdriver
- 2.5mm Hex Driver
- 5.5mm Nut Driver
- Needle nose pliers

Adhesives/Building Materials

- Thin CA
- Blue Thread Lock
- Servo Connector Safety Clip

Ailerons

- ☐ 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. Secure a 3-inch to MPX (110 mm) servo extension (FPZA1042) to be connected to the MPX harness to each of the two Bottom Wing Aileron servos. Use Flex Servo Connector Safety Clips (FPZA1040), heat shrink tubing or thread to secure the connection.
- ☐ 3. Insert the aileron servo into the servo bay with the output shaft towards the leading edge of the wing. Be sure to route the servo lead out of the wing before mounting the servo. Mount the servo to the wing using the servo mounting screws provided with your servos. Be sure to install the servos with the long servo extensions in the bottom wing panels and the servos with the shorter servo extensions in the top wing panels.



- ☐ 4. Using a pushrod with a length of 2 inches (50.8mm), assemble the aileron linkages so that the total length from center of ball to center of ball is approximately 72mm for the top wing and 75mm for the bottom wing. Final length will be adjusted when centering the control surface. Note that the opposite ends of each aileron linkage have opposite direction threads.
- ☐ 5. Attach the linkage to the servo arm. The correct hole location is 1 ³/₄-inches (44.4mm) 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:
 - M3x15 socket head cap screw
 - M3 washer
 - Ball Linkage
 - Servo Arm
 - M3 washer
 - M3 locknut

- ☐ 6. Use your radio system to center your aileron servos. Install your aileron servo arm onto the servo as close to **PARALLEL TO THE HINGE LINE** as possible. Apply blue thread lock to the servo arm screw and fully tighten the screw. If your servo arms have output shaft clamping screws, apply blue thread lock, and secure them in place as well.
- ☐ 7. With the radio powered-on and the servo centered so that the arm is **PARALLEL TO THE HINGE LINE**, adjust the linkage length so that the control surface is centered. When satisfied with the length of the linkage, secure the linkage to the control horn with the hardware in the following order:
 - M3x15 Socket Head Cap Screw
 - M3 Washer
 - Control Horn (Side 1)
 - Ball Link
 - Control Horn (Side 2)
 - M3 Washer
 - M3 Lock Nut



After the steps above are completed and the servo and linkages are installed, the assembly should appear as shown in the picture above. Both ailerons should appear the same but mirrored accordingly.

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

ARF AND ARFSV

If your airplane is an ARFSV you can start from this page.

However, for instructions on the assembly of the aileron pushrods, please reference the ARF steps on pages 13 through 15.

Note: The Flex Innovations Mamba 70cc G2 can be configured in a few different ways:

- With a push-pull rudder (servo in the tail)
- With a pull-pull rudder (central servo in the main fuselage)

Flex Innovations recommends the use of the pull-pull rudder setup with the servo in the main tray in the center of the fuselage. This will not only match the pictures in the manual but will allow you balance the airplane with the components in the recommended locations.

Quique's Tip:

Before any work is done on the fuselage I like to bond the horizontal stabilizer in place. This ensures that there is nothing in the way such as servos or landing gear as I manipulate the fuselage and the stabilizer to ensure that it is aligned properly and bonded strongly.

INSTALLING THE HORIZONTAL STABILIZER

Required for this section

Components

- Fuselage (Canopy Removed)
- Horizontal Stabilizer
- Elevator Joiner Wire

Tools

- Hobby Knife with a #11 Blade
- Covering Iron
- Ruler & Tape Measure

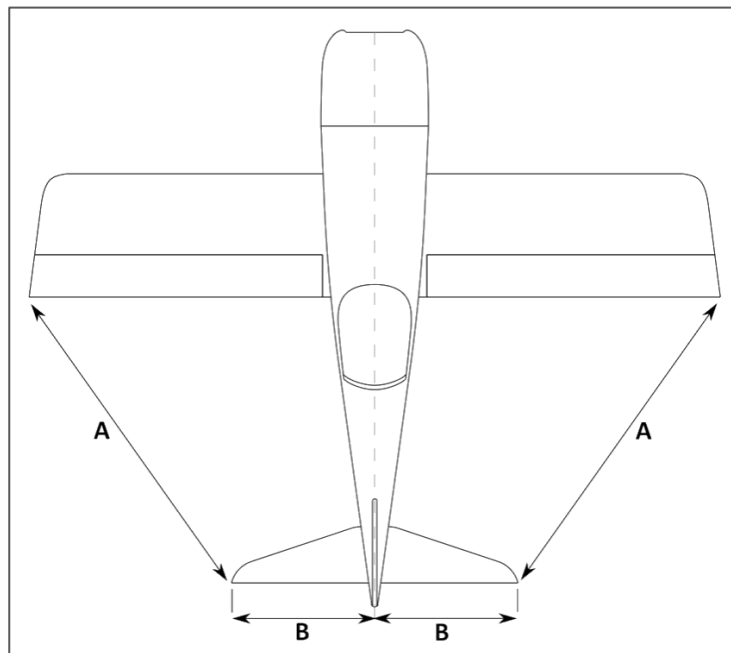
Adhesives/Building Materials

- Thin CA Adhesive
- Medium CA Adhesive



- ☐ 1. Insert the elevator joiner wire into the fuselage. Slide the horizontal stabilizer through the saddle, using the covering cutouts as reference lines. Be sure to insert the horizontal

stabilizer with the red and black checkered side towards the **TOP** of the airplane. Insert the lower wing tube into the fuselage and slide the left and right lower wings onto the tube at this time, ensuring that they are fully seated and locked in position. Watch the "field assembly" section video referenced near the end of this manual for details on how to do this.



- ☐ 2. Center the horizontal stabilizer in the fuselage so that the trailing edge (B) is equidistant on the left and right sides. Adjust the tips of the stabilizer fore and aft to achieve an equal distance between corresponding points on the stabilizer tips and wing tips on both sides of the fuselage.



- ☐ 3. Stand back approximately 10 feet (3 meters) from the rear of the airplane and carefully sight down the fuselage to level the horizontal stabilizer with the lower wing tube. It may be necessary to fabricate some shims from thin balsa sheet to correct a stabilizer that is out of level
- ☐ 4. On both the top and bottom of the horizontal stabilizer, mark the location of the stabilizer in the fuselage with a felt-tipped pen. Remove the horizontal stabilizer from the fuselage.



- ☐ 5. Using a brand-new #11 hobby knife blade, remove the covering from the horizontal stabilizer where it is inside the fuselage, leaving (1mm) gap from the lines made. Use only enough pressure to cut through the covering.
- IMPORTANT!: ONLY cut through the covering. DO NOT cut into the wood structure of the horizontal stabilizer. Cutting into the structure of the horizontal stabilizer will SEVERELY weaken the structure, and result in a subsequent failure of the horizontal stabilizer, and crash of the model.**



- ☐ 6. Use a covering iron to seal down all the edges of the covering after they have been cut.
- ☐ 7. Re-insert the horizontal stabilizer and locate it in the fuselage using the lines created above. Verify proper alignment by repeating steps 1 to 3 in this section.

NOTE: Don't forget to re-insert the elevator jointer before bonding the horizontal stabilizer in place.



- ☐ 8. Once satisfied with the alignment of the stabilizer, carefully tack it into place with thin CA, then wick CA around the entire upper surface of the horizontal stabilizer. Where there is no visible gap use thin CA adhesive, where there is a visible gap use medium CA adhesive. Wait a few moments for the CA to cure, then carefully roll the airplane inverted to glue the underside of the stabilizer. Do not use CA accelerator for this step.

ELEVATOR INSTALLATION

Required for this section

Components

- Fuselage Assembly
- Elevator Control Horns (2 or 4)
- Control Horn Bases (1 or 2)
- Left and Right Horizontal Stabs

Tools

- Hobby Knife with a #11 Blade

Adhesives/Building Materials

- Isopropyl Alcohol
- 30-Minute Epoxy
- Paper Towels
- Mixing Cups
- Mixing Sticks
- Petroleum Jelly
- Toothpicks

Note: Install only the control horn on the elevator half on the LEFT side of the fuselage (as seen from the rear of the airplane).

Control Horn Installation



- ☐ 1. Use a hobby knife with a #11 blade to remove the covering from the bottom side of the elevator in the same way as was done with the ailerons. The control horn slots are just outside the cutout in the elevator as shown in the picture above.
- ☐ 2. Prepare the control horns by scuffing the portion of the control horn that extends into the control surface with medium grit sandpaper. Use isopropyl alcohol and a paper towel to clean the control horn and remove any excess debris left after scuffing.
- ☐ 3. Mix an adequate amount of 30-minute epoxy. Apply epoxy to the control horn slots in the elevator as well as the control horn. Push the control horns into the slot, being sure to wipe away any excess epoxy with isopropyl alcohol and a paper towel.

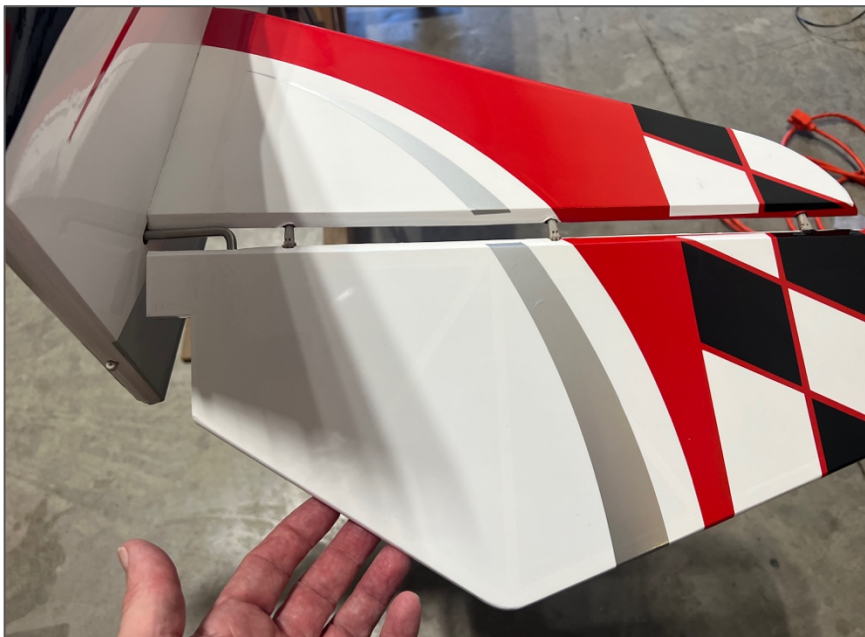
Quique's Tip:

To better help align the control horns with one another, use the provided hardware to secure the control horns to the ball link. This will keep them aligned while they are glued in place.

Elevator Installation:

- ☐ 1. The hinges are pre-bonded into the elevators at the factory, however, pull on the hinges to ensure they are properly bonded. Test fit the hinges into the horizontal stabilizer, checking for minimal hinge gap and overall alignment and for proper elevator jointer fit and movement (if relevant).
- ☐ 2. Use medium grit sandpaper to scuff the portion of each hinge that is inserted into the horizontal stab. Use isopropyl alcohol and a paper towel to clean the hinge and remove any debris that may be left after scuffing.

- ☐ 3. Use a toothpick or cotton swab to apply a small amount of petroleum jelly to the pivot point of each hinge. Do not apply petroleum jelly to the entire hinge. The petroleum jelly is used to prevent glue from adhering to the pivot of the hinge, keeping the hinge moving free.



- ☐ 4. Starting with one elevator, mix an adequate amount of 30-minute epoxy and apply epoxy to the hinge slots in the horizontal stabilizer and the elevator jointer in the elevator. Line up the hinges into each slot and the elevator jointer into its slot



- ☐ 5. Seat the elevator completely, checking for proper alignment. Use isopropyl alcohol and a paper towel to clean up any excess epoxy before it cures. Make sure the hinge gap is as tight as possible, while still allowing for proper control surface deflection.
- ☐ 6. Use masking tape or equivalent to hold the elevators in a neutral position. Wait at least 1 hour before removing the tape and testing the control surfaces.
- ☐ 7. Repeat the process for the other elevator.

ELEVATOR SERVO AND LINKAGE INSTALLATION

Required for this section

Components

- Fuselage Assembly
- Elevator Servo (1 or 2*)
- Elevator Servo Arm (1 or 2*)
- Servo Extension (1 or 2*)
- M3x15 Socket Head Cap Screw (4 or 8*)
- M3 Washer (8 or 16*)
- M3x12 Washer (4 or 8*)
- M3 Lock Nut (4 or 8*)

Tools

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

Adhesives/Building Materials

- Servo Connector Safety Clip

NOTE: The left-hand side of the fuselage has a single servo opening, this is for the elevator servo. The right-hand side of the fuselage has two servo openings, a lower opening that is used for the push-pull rudder setup and an upper opening that is not used. Ensure that you install the elevator servo on the LEFT side of the fuselage.

- ☐ 1. Locate the elevator servo pocket on the left side (if viewed from the rear) of the fuselage, below the stabilizer cutout. Remove the covering from this pocket, leaving approximately 1/8-inch (3mm) excess covering inside the slot. Use a covering or trim iron to seal the excess into the pocket



- ☐ 2. Follow the same steps for installing the aileron servo to install the elevator servo. Secure an 18-inch (460mm) (FPZA1046) extension to the servo. Route the extension to the front of the fuselage and install the elevator servo with the output shaft facing the **NOSE** of the aircraft.

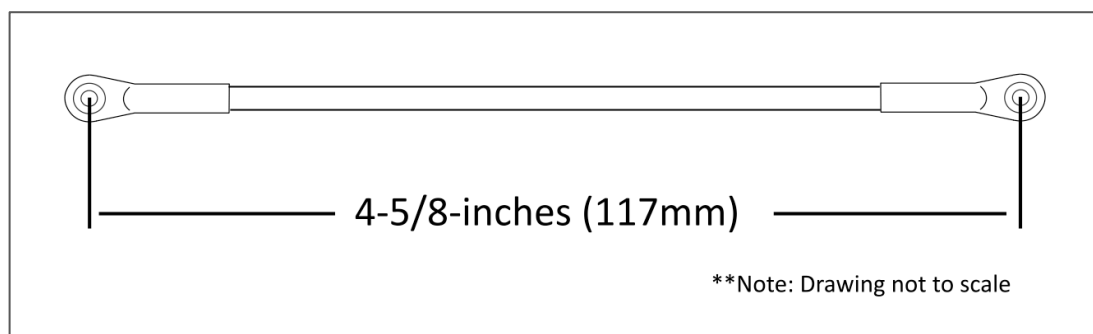


- ☐ 3. Secure the servo extension with a servo connector safety clip (or equivalent). We also recommend that you secure the servo connection inside the fuselage with cable ties to prevent it from bouncing around and accidentally become disconnected over time.



- ☐ 4. Power on your radio system to center the servo. Install a 1 ¼-inch (32mm) servo arm onto the servo. 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.

- ☐ 5. Using a pushrod of 3 ½-inch (89mm) length, assemble the elevator linkages and ball links so that the total length from center of ball to center of ball is approximately 4 ⅝-inches (117mm). 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 1 ¼-inch (32mm) 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:
- M3x15 socket head cap screw
 - M3 washer
 - Ball Linkage
 - Servo Arm
 - M3 washer
 - M3 locknut
- ☐ 7. Attach the linkage to the control horn. The order of hardware components, starting from the tip of the stabilizer is as follows:
- M3x15 socket head cap screw
 - M3 washer
 - Control Horn #1
 - Ball Linkage
 - Control Horn #2
 - M3 washer
 - 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.



- ☐ 9. After installation is complete, your linkage setup should match the image above.

RUDDER, TAILWHEEL INSTALLATION

Required for this section

Components

- Fuselage Assembly
- Tail Gear Assembly
- Steering Ball Link (1)
- M3 X12mm Socket Head Cap Screw (2)
- M3 Flat Washer (2)
- Rudder Control Horns (2, single sided for push-pull, double sided for pull-pull)
- Rudder Control Horn Plates (1 or 2)

Tools

- Hobby Knife with #11 Blade
- 2.5mm Hex Driver
- Drill
- 4mm Drill Bit
- End Cutters
- Small Hobby File

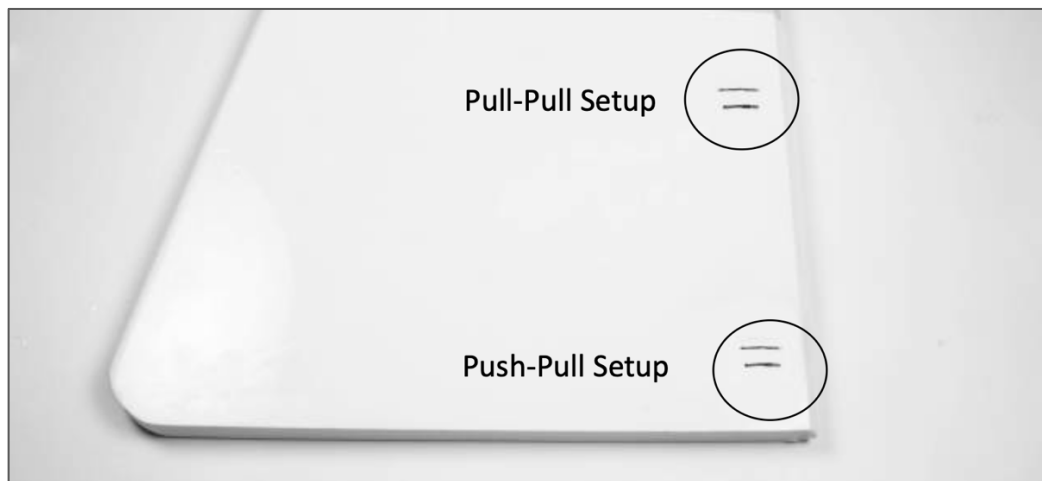
Adhesives/Building Materials

- Thread Lock
- Medium CA adhesive
- Isopropyl Alcohol
- 30-minute Epoxy
- Mixing Cups
- Mixing Sticks
- Paper Towels
- Petroleum Jelly
- Transparent tape

NOTE: Due to the variability of the servo locations, different methods of setup may cause the center of gravity to vary significantly. It is your responsibility to ensure the aircraft balances at the proper center of gravity location prior to flying the model.

Rudder Control Horn Installation

The push-pull setup and the pull-pull setup for the Flex Mamba 70cc G2 use two different control horn locations, these are illustrated in the picture below:



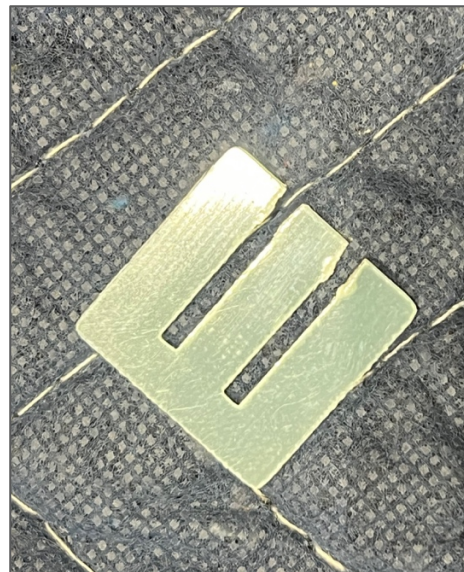
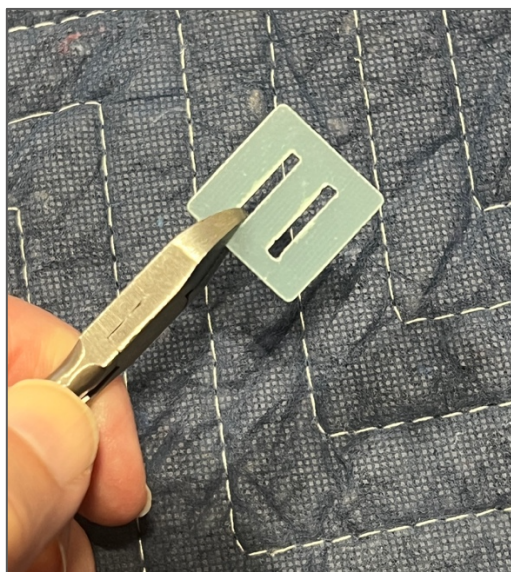
If using the pull-pull rudder setup, remove the covering from **BOTH** sides of the upper control horn slots. If using a push-pull rudder setup, remove covering **ONLY** from the **RIGHT SIDE** of the lower control horn slots.

If you are using the push-pull rudder setup follow the instructions for the elevator servo installation with the servo on the **BOTTOM RIGHT** side of the fuselage and connecting the push rod to the rudder control horn (rudder installation is described below).

This section will cover the installation of the pull-pull setup.



- 1. Locate the rudder. When using pull-pull rudder setup so you will be installing a double-sided control horn in the upper slot of the rudder. Use a hobby knife with a #11 blade to remove the covering from BOTH sides of the rudder at the location shown in the picture above. Cut the slots on both sides of the rudder first and insert each of the control horns through the rudder until they are seated as shown in the picture above.



- ☐ 2. Trim the control horn plates with end cutters as shown above, clean up the cuts with a small hobby file, this will enable you to install them with the control horns in place.
- ☐ 3. Use the trimmed control horn plates to mark the area where you will remove the covering.
- ☐ 4. Prepare the control horns by sanding the portion of the control horn that extends into the control surface with medium grit sandpaper. Use isopropyl alcohol and a paper towel to clean the control horns and remove any excess debris from the control horn.



- ☐ 5. Use CA adhesive to bond the control horns and the control horn plates in place.

Quique's Tip:

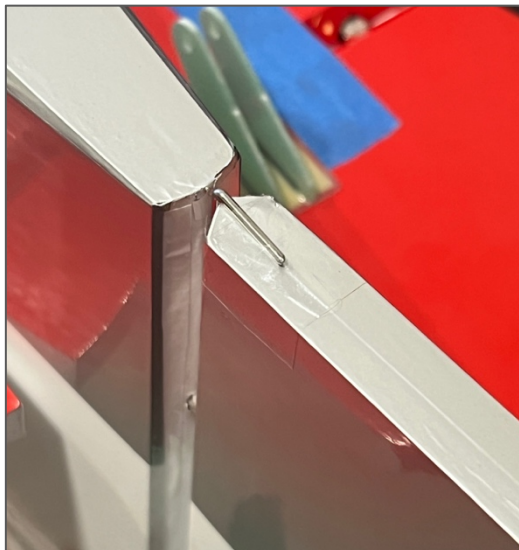
To ensure proper alignment of each control horn, you can secure the ball link to the horns and then glue the horn in place with the ball link attached. This will ensure even alignment of both control horns.

Rudder Installation

- ☐ 1. Before installing the rudder install the steering ball link.



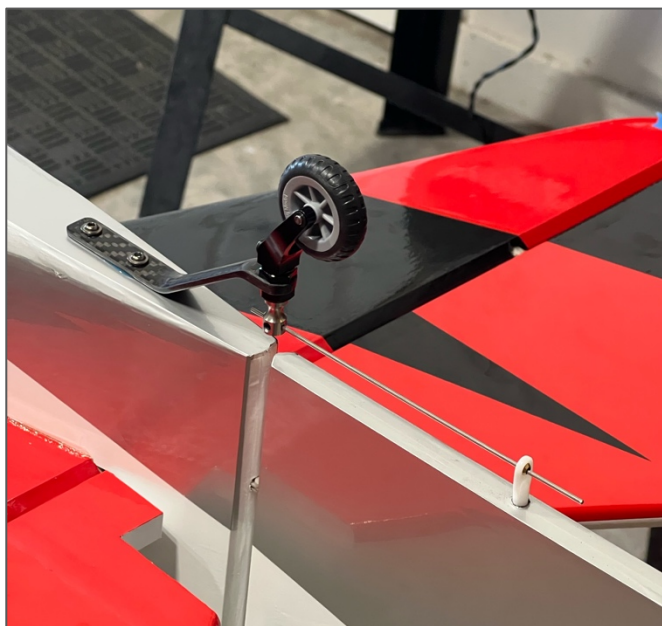
- ☐ 2. With a 4mm drill bit, drill a hole in the center of the rudder bottom side. Place this hole about 4-inches (100mm) from the leading edge of the rudder.
- ☐ 3. Glue the steering ball link in the hole with 30 min Epoxy. Note: when you glue the ball link make sure the ball hole is perpendicular to the rudder leading edge so the steering arm can go through.
- ☐ 4. The rudder is removable, and the half hinges have been pre-installed for you at the factory.



- ☐ 5. Install the hinge pin from the bottom of the rudder. Line-up the factory installed, half hinges and slide the hinge pin through them, one at a time, ensuring that the rudder moves freely.
- ☐ 6. Secure the hinge pin to the rudder with a piece of transparent tape on the bottom.

Tail Wheel Installation

- ☐ 1. Locate the (2) holes in the bottom of the fuselage close to the tail. Use a Hobby Knife with #11 blade to remove the covering and expose the holes.
- ☐ 2. Place a flat washer on each M3 X 12mm Socket Head Cap Screw.
- ☐ 3. Apply Thread Lock to the screws and use a 2.5mm hex driver to mount the tail gear assembly as show in picture below.



- ☐ 4. Before mounting the tail wheel to the fuselage feed the steering wire into the ball link. Once in place, the steering linkage will look like the picture above.

RUDDER SERVO AND LINKAGE INSTALLATION

Required for this section

Components

- Fuselage Assembly
- Rudder Servo
- 2.5-inch Double Servo Arm
- Wire Crimps (4)
- Pull-Pull Cable (2)
- Ball Link (4)
- 3mm x 15mm Socket Head Cap screw (4)
- 3mm Flat Washers (X8)
- 3mm Lock nut (X3)

Tools

- #1 Phillips Screwdriver
- 2.5mm Hex Driver
- 5.5mm Nut Driver
- Needle Nose Pliers
- Threaded or Shrink Tube

Adhesives/Building Materials

- Thin CA
- Thread Locker

- ☐ 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 rudder tray inside the fuselage. 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. Insert the rudder servo into the rudder tray inside the fuselage with the output shaft towards the nose of the airplane. Mount the servo to the tray using the screws provided with your servo.
- ☐ 3. Center the servo using your radio system. Install the 2.5-inch 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.

Quique's Tip:

You may find that the servo arm for pull-pull does not fit close to perpendicular to the servo case. Since the Mamba 70cc G2 does not require a servo arm with an offset for pull-pull, try rotating the arm 180° to see if it fits closer to perpendicular when mounted in this orientation.



- ☐ 4. Locate the pull-pull cable exit holes in the rear of the fuselage. Use a hobby knife with a #11 blade to remove the covering from the hole. The plastic tube guide is located above the horizontal stab, roughly aligned with the elevator servo opening (see picture above). The tube should run perpendicular to the rudder hinge line. With the canopy removed and looking from the cockpit towards the tail you will see the nylon tube guides for the cables.



- ☐ 5. Using pliers, thread a rigging coupler approximately halfway into a ball link. 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.
- ☐ 6. Attach a ball link and rigging coupler assembly to each side of the rudder servo arm. The order of hardware is as follows:
- M3x15 Socket Head Cap Screw
 - M3 Washer
 - Ball Link (with rigging coupler)
 - Servo Arm
 - M3 Washer
 - M3 Lock Nut



- ☐ 7. If using the recommended servo arm, the correct hole locations are the farthest holes from the center of the servo arm as shown in the picture above.
- ☐ 8. Route the pull-pull wire through the fuselage and out the exit holes located in step 4. Be sure to route the cables so that they do not tangle or cross. The cables should route straight from the servo arm to the exit of the fuselage.
- ☐ 9. Attach the ball link to the rudder control horn using a 2.5mm hex driver and a 5.5mm nut driver. Use the same order of hardware as used with the aileron control horns (page 14).
- ☐ 10. Power on your radio system and make sure the control horn is perpendicular to the servo case. Route a cable through a piece of heat shrink tubing, through a crimp and then through the rigging coupler mounted to the servo arm. Route the cable back through the crimp. For extra security, you can loop the cable around the crimp a final time. Repeat for the other pull-pull cable.



- ☐ 11. Pull the cables tight, while keeping the rudder centered. Once happy with the centering of the servo with the cables tight, use a crimping tool to permanently attach the crimp to the cables. Apply a small amount of thin CA to the cable and crimp joint for extra security.

Once the CA has fully cured, slide the heat shrink over the joint and shrink it to secure it in place.

- ☐ 12. Adjust final cable tension by removing the ball links and by threading the rigging coupler further into the ball link. Start with the side that was only threaded one-third of the way into the link. Be sure to keep the rudder centered in the process. Do not over tighten the cables.

Quique's Tip:

When new, pull-pull cables will stretch slightly in the first several flights. Adjust the tension as needed until the stretching stabilizes.

LANDING GEAR INSTALLATION

Required for this section

Components

- Fuselage Assembly
- Wheel Pant (2, L & R)
- Main Wheel (2)
- M4x25 Socket Head Cap Screw (4)
- M4 Flat Washer (8)
- M4 Lock Nut (4)
- M3x15 Socket Head Cap Screw (4)
- M3 Flat Washer (4)
- Landing Gear Axle (2)
- M5 Lock Collar (4)

Tools

- 1.5mm Hex Driver
- 2.5mm Hex Driver
- 3mm Hex Driver
- 7mm Wrench
- 10mm Wrench
- 12mm Wrench
- Needle Nose Pliers (optional)

Adhesives/Building Materials

- Blue Thread Lock



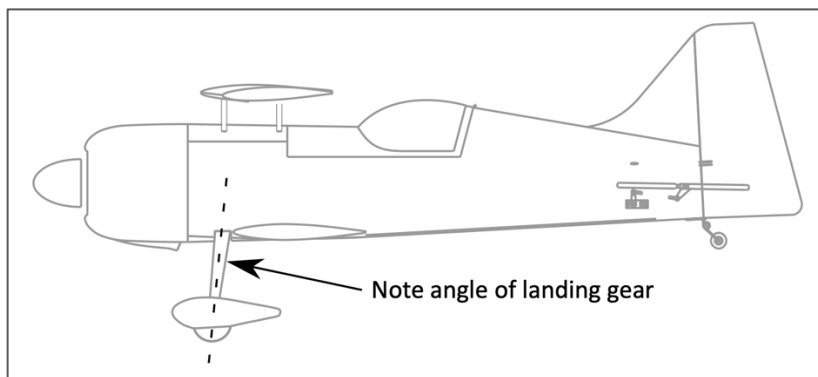
- ☐ 1. Assemble the axle to the landing gear leg. Use one 5mm flat washer between the lock nut and the landing gear leg as shown above. Fully tighten using a 10mm and 12mm open end wrench.



- ☐ 2. Install the wheel on the axle, followed by the wheel collar orienting it in such a way that the side with the smaller diameter faces the wheel. Make sure the collar set screw lines up with the flat spot on the axle. Use blue thread lock on the set screw and tighten the set screw in the wheel collar. Ensure that the wheel spins freely after everything has been tightened.



- ☐ 3. Install the wheel pants using a 2.5mm hex driver, two M3x15 socket head cap screws and two M3 washers. Apply blue thread lock to the screws before securing them in place.



- ☐ 4. Be sure to note that the landing gear sweeps forwards as it moves away from the fuselage. The wheel pant mounting holes are specific to a side.



- ☐ 5. With the fuselage inverted on your workspace, place the landing gear on the fuselage so that it sweeps backward as it moves away from the fuselage. Using thread lock, place an M4x25 socket head cap screw with an M4 washer through the landing gear and through the landing gear mount in the fuselage. The landing gear will mount to pre-installed blind nuts in the fuselage. Using a 3mm hex driver, start all the bolts into the landing gear before final tightening

ENGINE AND THROTTLE SERVO INSTALLATION

The Mamba 70cc G2 is designed for a twin 70-76cc engine.

This manual covers the installation of the DA-70

DA-70 ENGINE INSTALLATION

Required for this section

Components

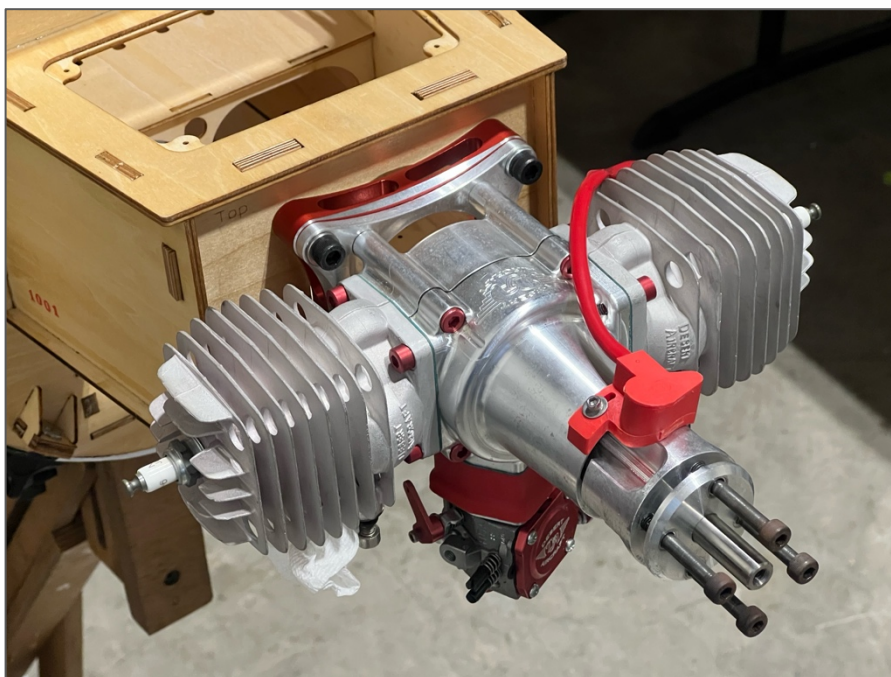
- Fuselage Assembly
- Engine
- Flex Engine Mount Spacer for 70cc engine (15mm)
- 1/4-20 Lock Nut (4)
- 1/4-20 x 1 1/2-inch Socket Head Screw (4)
- 1/4-inch flat washer (4)
- 1/4-inch fender washer (4)

Tools

- 1/4-inch Hex Driver

Adhesives/Building Materials

- ☐ 1. The engine mounting holes for the DA-70 and GP76 are pre-drilled into the firewall for your convenience. If using a different mounting pattern, the "+" represents the engine crankshaft location.



- ☐ 2. Mount the engine (without the exhaust) to the firewall using a Flex Engine Mount Spacer for 70cc engine (15mm), (4) 1/4-20 x 1 1/2-inch socket head cap screws, (4) 1/4-inch flat washers, (4) 1/4-inch fender washers and (4) 1/4-20 Lock Nuts. The order of components is as follows:

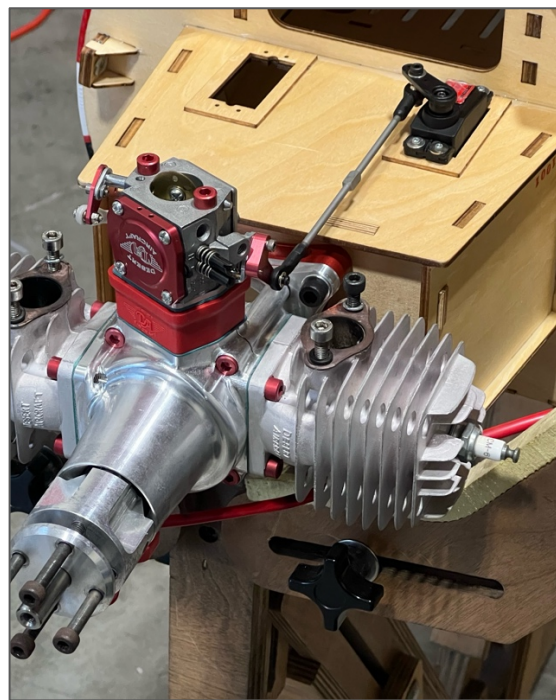
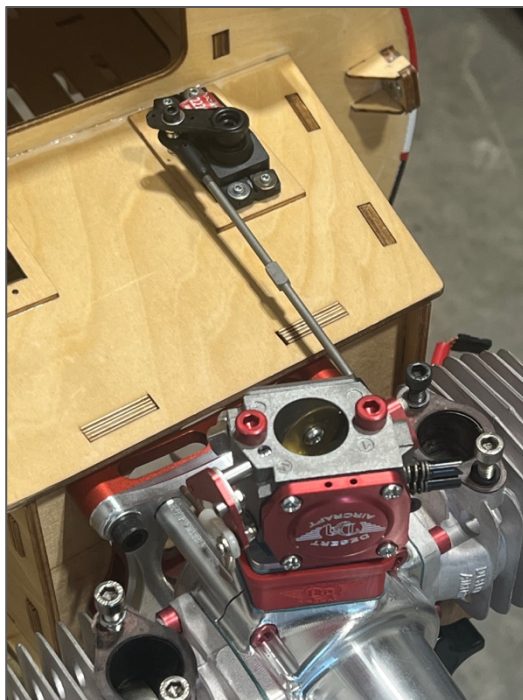
- ¼-20 x 1 ½-inch Socket Head Cap Screw
- ¼-inch flat washer
- Engine
- 15mm Engine Standoffs
- Firewall
- Fender washer
- Lock nut

DA-70 Throttle Servo and Throttle Linkage Installation

Required for this section

Components	Tools	Adhesives/Building Materials
○ Fuselage Assembly ○ Throttle Servo ○ 18-inch (460mm) Servo Extension ○ Safety Servo Clip Connector ○ Throttle linkage ○ M2x10 Phillips Head Screw (1) ○ M2 Flat Washer (2) ○ M2 Lock Nut (1) ○ M3x15 Phillips Head Screw (1) ○ M3 Flat Washer (2) ○ M3 Lock Nut (1)	○ #1 Phillips Screwdriver ○ 2mm Hex Driver ○ 2.5mm Hex Driver	○ Thin CA

- ☐ 1. Attach the 18-inch (460mm) servo extension (FPZA1046) to the throttle servo. Use a Servo Connector Safety Clip (FPZA1040), thread or heat shrink tubing to secure the extension in place.
- ☐ 2. There are two options for the servo tray. The right-side location is used for the DA-70 and the left-side location is used for the GP76. Install the throttle servo in the appropriate location with the output shaft towards the nose of the aircraft.
- ☐ 3. Use the radio system to center the servo, then install a 7/8-inch (20mm) standard plastic servo arm onto the servo. The pushrod for the throttle is provided and comes pre-assembled from the factory with a 2mm ball link on one end to fit the engine throttle arm and a 3mm ball link on the other to fit the servo arm.



- ☐ 4. Secure the M3 ball-link on the throttle linkage to the outside hole in servo arm using the M3 x 15mm screw, 3mm washers (2), and 3mm lock nut. Do not use thread lock on these parts, as it can weaken the plastic insert in the lock nut. The order of components is as follows:
 - M3 Screw
 - M3 Washer
 - Servo Arm
 - M3 Washer
 - M3 Lock Nut
- ☐ 5. Secure the M2 ball link to your engine throttle arm using the M2 x 10mm screw, 2mm washers (2), and 2mm lock nut. Do not use thread lock on these parts, as it can weaken the plastic insert in the lock nut. The order of these components should be:
 - M2 Screw
 - M2 Washer
 - Throttle Arm
 - M2 Washer
 - M2 Lock Nut

Quique's Tips:

- 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). Get 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

- Fuselage Assembly
- Ignition
- Ignition Switch
- Ignition Battery
- Regulator (if applicable)

Tools

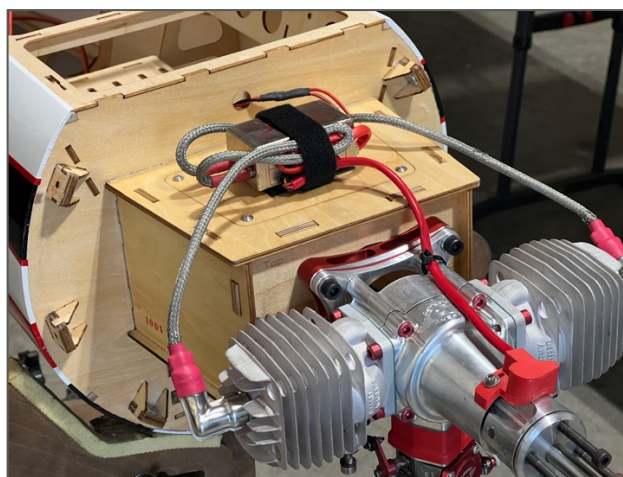
- Hobby Knife w/#11 Blade
- #1 Phillips Screwdriver

Adhesives/Building Materials

- 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-70 the below depicted location works well. There are many ways to install an ignition and we recommend you mount it per your engine manufacturer's instructions.



- ☐ 3. Pass the hook and loop strap through the slots in the motor box and secure the ignition as box show in the picture above.

- ☐ 4. Place your ignition battery inside the fuselage. Several locations are provided where the pack can be mounted and you can move it forward or aft as needed to achieve the desired CG. Use adhesive-backed hook and loop tape between the battery and the fuselage and secure the battery with a hook and loop strap.
- ☐ 5. Route all of your wiring and make all electronic connections. Secure any permanent connections with 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 over time from vibration. A typical ignition setup will be connected as follows:

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

FUEL TANK INSTALLATION

Required for this section

Components

- Fuselage Assembly
- Fuel Tank
- Fuel Line

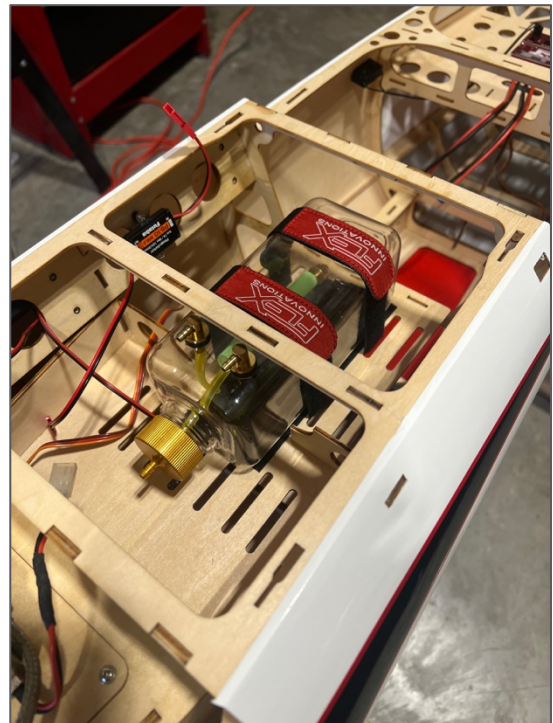
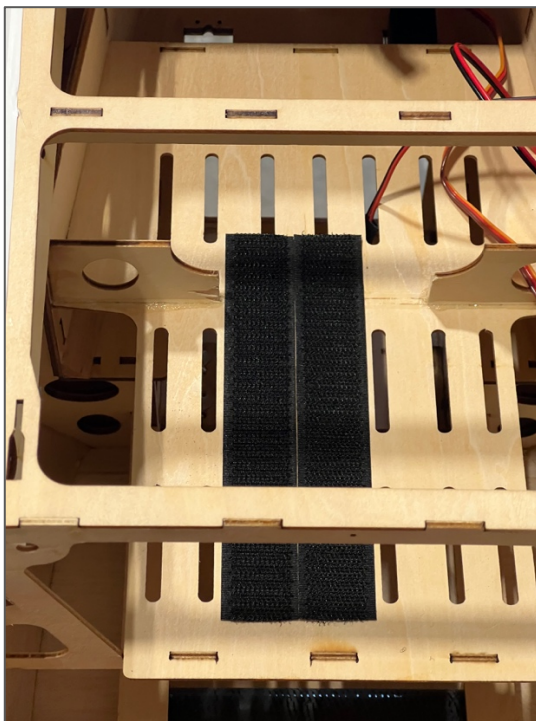
Tools

- Pliers

Adhesives/Building Materials

- Hook and Loop Strap (2)
- Adhesive-Back Hook and Loop Tape

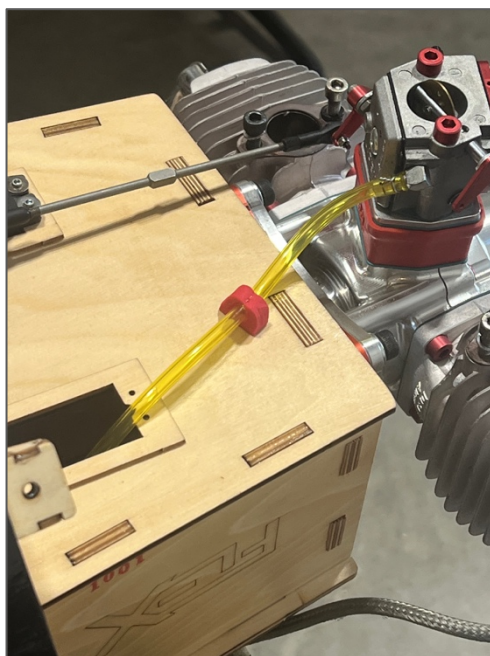
The Flex Innovations Lightweight 24oz Fuel Tank is included with your Mamba 70cc G2. Before installing the fuel tank check all fittings are properly installed and that the clunk line inside the tank is appropriately sized.



- ☐ 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 24oz Lightweight Fuel/Smoke tanks (FPM2019) 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.



- ☐ 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 McFueller 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 as shown in the image above. 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 over-tighten 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 (see pictures above).

EXHAUST AND COWLING INSTALLATION

Required for this section

Components	Tools	Adhesives/Building Materials
○ Fuselage Assembly ○ Cowling ○ Cowling Baffles ○ Muffler (or Canisters/Headers) ○ Exhaust Gasket (2) ○ M2.5 x 4 Wood Screw ○ Motor Box Cover Plate ○ M3 x 20 socket head cap screws (2) ○ M3 Flat Washer (6) ○ M3 x 10mm socket head cap screws (8) ○ O-Rings (8) ○ Canister mount plate ○ Silicone tubes ○ M3 x 15 Socket Head Cap Screw (4)	○ 2.5mm Hex Driver ○ #1 Phillips Screwdriver ○ Rotary Tool ○ Rotary Tool Sanding Drum ○ Felt-Tipped Pen	○ Colored Silicone (Red typically preferred) ○ Goop ○ Blue Thread Lock

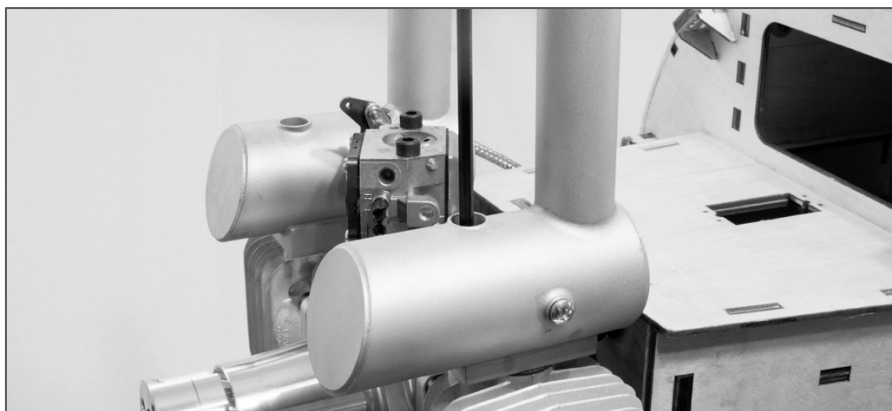
If you plan to use stock mufflers, please follow the instructions (A) below. If you plan on using canisters, please follow canister instructions (B) on the following pages. Be sure to follow the engine baffling instructions for both setups.

- ☐ 1. Install the manual choke linkage using your preferred method. You could use a 2mm ball link and 2mm linkage found on many 60-class ARF or ARFSV aircraft. We leave the pushrod long until the cowling is installed and then trim it for the proper length.
- ☐ 2. To aid in cooling, remove the covering from the bottom of the fuselage just aft of the lower speed-lock pin locations as shown in the picture below. Leave approximately 1/8-inch extra covering around the edges and wrap the covering into the fuselage using a sealing iron.

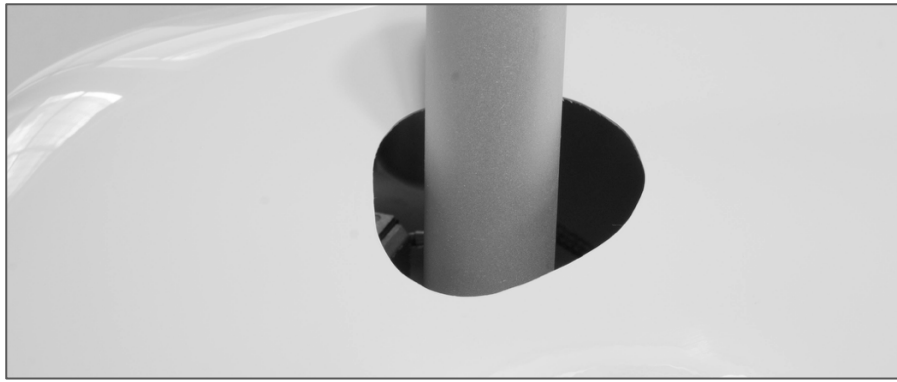


Muffler Installation (A)

- ☐ 1A. Install the muffler on the engine using the hardware provided with your engine. Follow your engine manufacturer's installation instructions. Typically, most engines will use a gasket between the muffler and cylinder and the socket head cap screws will pass through a lock washer before securing the muffler to the cylinder.



- ☐ 2A. Every engine and muffler choice will require different openings in the cowling. The picture above shows a DA-70 with DA mufflers. Other engine brands and other mufflers will require different cut outs. Use a felt-tipped pen to mark the location that the cowling needs to be cut for the exhaust to extend through the cowling. Use a rotary tool with a sanding drum to cut the holes. Test fit the cowling to be sure there is adequate gap between the muffler and cowling. We recommend at least 1/8-inch (3mm) gap.

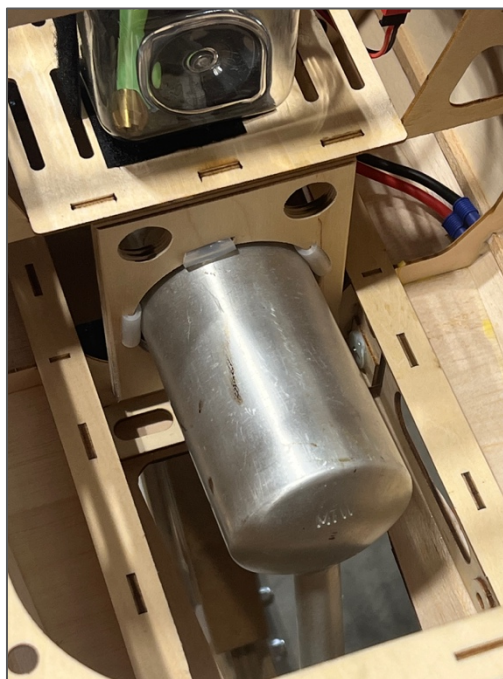


Canister Installation (B)

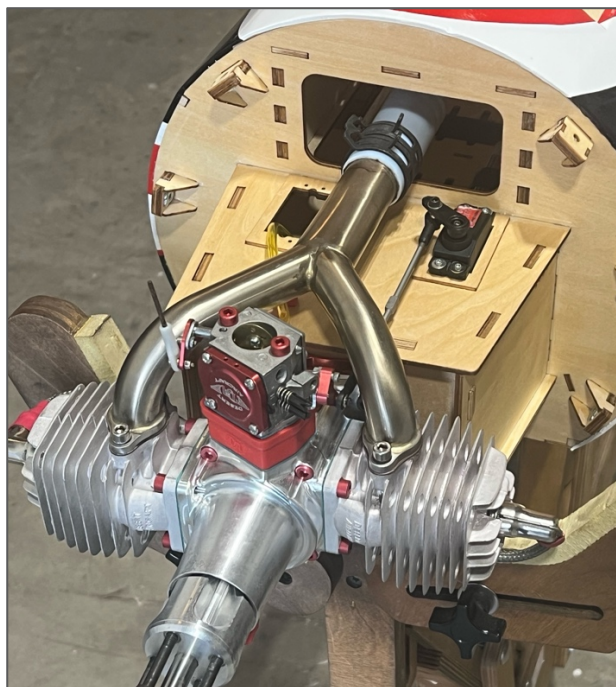
Recommended canister and headers for the different engines are listed in the front section of the manual.



- ☐ 1B. Install the two-to-one header on the engine using the hardware provided with your engine. Follow your engine manufacturer's installation instructions. Typically, most engines will use a gasket between the header and cylinder, and the socket head cap screws will pass through a lock washer before securing the muffler to the cylinder.

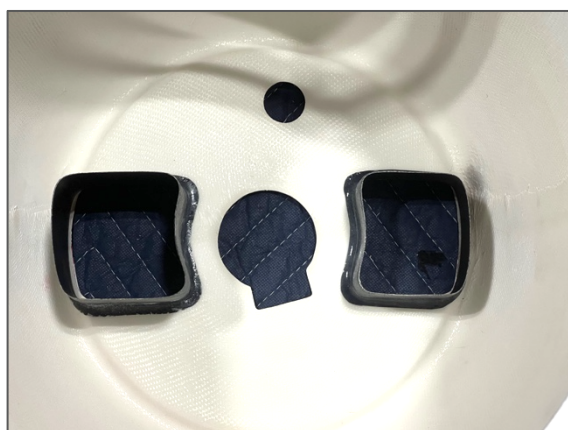


- ☐ 2B. Install the 5-silicone tubes into the canister mount plate. Feed the canister into the rear of the fuselage and then slide it forward into place through the canister mount plate. Connect the canister to the two-to-one header using the provided Teflon tube and clamps.

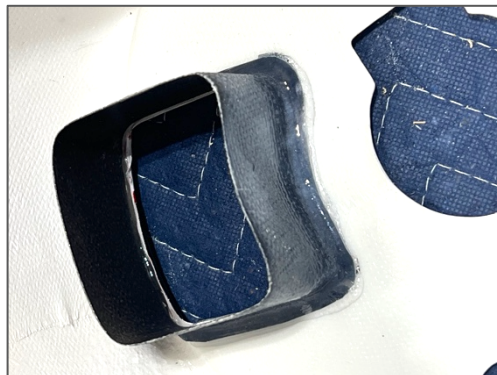


- ☐ 3B. The images above show the typical DA-70 with a 2 to 1 header for a single canister.
- ☐ 4B. Once the canister is in place you can bond the canister mount plate in place. If you ever need to remove the canister you will first need to remove the canister mount plate. If this is a concern you can install the canister mount plate with wood screws instead of bonding it in place.
- ☐ 5B. Every engine and exhaust choice will require different openings in the cowling. The images above show a DA-70 with 2 to 1 header install. This show that headers stay inside the cowling and no additional opening is required.

Baffle and Final Cowling Installation



- ☐ 1. Locate the fiberglass engine baffles. These are designed to fit the DA-70 and GA76. The longer baffle will be on the right-hand side of the airplane, and the shorter one will be on the left-hand side.



- ☐ 2. Bond the baffles in position using Goop or similar adhesive. Wait 24 hours for the adhesive to dry



- ☐ 3. Once the baffles are in place dry fit the cowling and make any adjustments to any of the openings or the baffles to ensure a good fit, exhaust clearance and access to choke linkages.
- ☐ 4. Before installing the cowling, verify that all spark-plug wires, fuel lines and any battery or servo wires are correctly installed and well-secured.



- ☐ 5. Once you are happy with the fit of your cowling, proceed to installing the cowl. (8) M3x15mm screws, (8) 3mm O-rings, and (8) 3mm washers. The O-rings should be placed between the washer and cowling.

Note: As shown in the picture below, the front of the cowling comes painted white. However, if you would prefer it to be black you can use the provided decal. Clean the cowling with rubbing alcohol to ensure that it is clean. Apply the decal and cut out all the openings in the cowling for intake, cooling, and carb using a sharp hobby knife.



- ☐ 6. Install your propeller and spinner. For the DA-70, we recommend a Flex 24x9 carbon fiber propeller and the Mamba 70cc carbon fiber spinner.

CENTER WING CABANE INSTALLATION

Required for this section

Components

- Fuselage Assembly
- Top Wing Center Section
- Cabane Struts (4)
- M3 x 15mm Screws (8)
- M3 Washers (8)
- M4 X 8mm Screws (4)
- M4 Washers (4)
- 30-inch (762mm) Top Wing Aileron Servo Extensions (2)

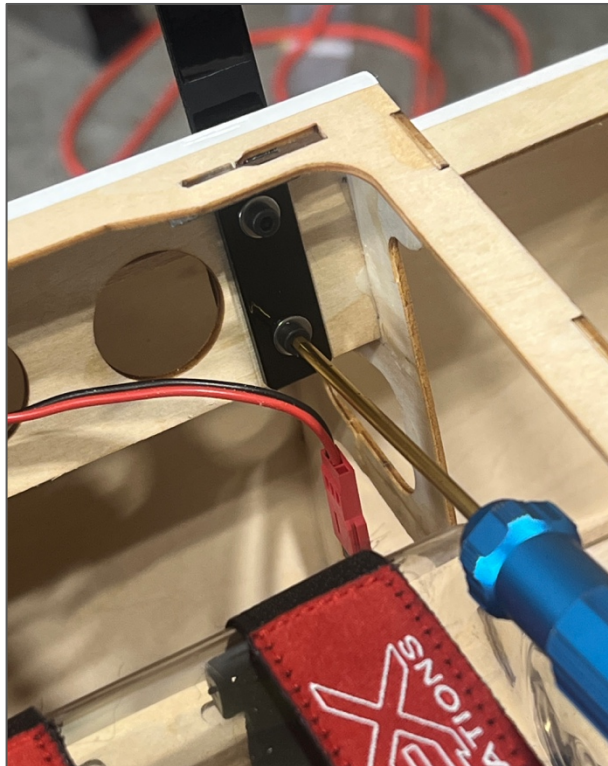
Tools

- 2.5mm Hex Driver
- 3mm Hex Driver

Adhesives/Building Materials

- Blue Thread Lock
- Cable Ties

- ☐ 1. Locate the 4 slots on the sides of the fuselage that will be used to install the cabane struts.



- ☐ 2. Insert a cabane strut into one of these slots. Using a 2.5mm hex driver and blue thread locker, install the strut using two M3 x 15 screws and two M3 washers. Be sure the top of the strut extends out towards the wing tips. Repeat this process for the other 3 cabane struts.





- ☐ 3. With the airplane inverted on your workspace, and the tops of the struts accessible, align the center section with the cabane struts. Use a 3mm ball driver and blue thread locker to insert an M4 x 8 socket head cap screw and M4 washer through the strut and into the blind nut located in the wing center section. Fully tighten the screw.

Quique's Tips:

- To help ensure a true and straight airframe, it is best to start all 4 screws without tightening them down fully. Once all four screws have been started, tighten the screws in an "star" style pattern until they are fully tightened. This also can help prevent any alignment issues with other struts or parts.
- ☐ 4. Route two 30-inch (762mm) (FPZA1056) servo extensions up the rear cabane strut, and out the wing center section as shown. Secure the extension to the cabane struts using cable-ties.

FINAL ASSEMBLY

RADIO INSTALLATION

Required for this section

Components

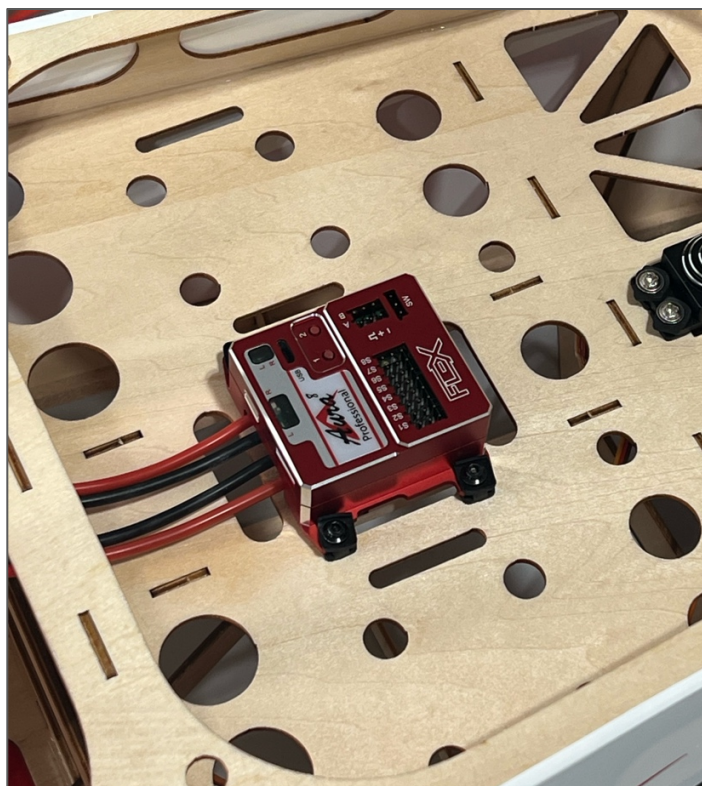
- Fuselage Assembly
- Lower Wing Servo Extensions 12-inch (305mm) with MPX connector
- Receiver
- Receiver Switch
- Aura 8 Professional (Optional)
- Receiver Batteries
- Hook and Loop Straps
- Adhesive-Backed Hook and Loop Tape

Tools

- #1 Phillips Screwdriver
- Hobby Knife with #11 Blade
- 2mm Hex Driver
- 1/16in Drill Bit

Adhesives/Building Materials

- Thin CA Adhesive
- Cable Ties



- ☐ 1. If you are using the Aura 8 Professional AFCS, it should be mounted forward of the rudder servo location in the center of the fuselage as shown in picture above.
- ☐ 2. If you are not using an Aura 8, you can mount your receiver in the same location, following the manufacturer's directions.

- ☐ 3. Mark the location of the Aura mounting screws. Use a 1/16in drill bit to pre-drill pilot holes for the four mounting screws.
- ☐ 4. Use a #1 Phillips screwdriver to thread a mounting screw into each of the pilot holes to cut threads into the mounting rails. Remove the screws 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 on to the next step.
- ☐ 5. Once the CA has fully cured, mount the Aura using a #1 Phillips screwdriver to secure the (4) screws.



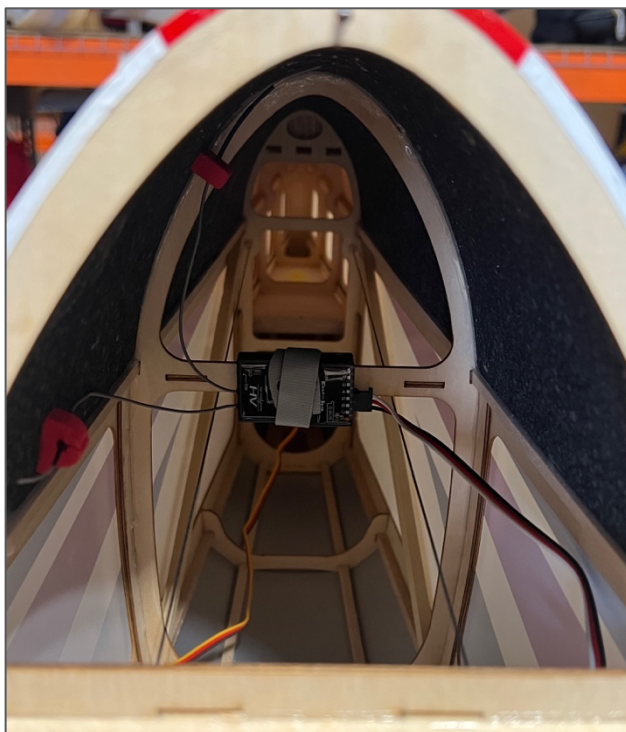
- ☐ 6. Locate the RX/Aura switch just under the canopy. Note that there are switch locations on both sides of the fuselage. Remove the covering from the hole of your choice using a hobby knife with a #11 blade and install your RX switch. Use blue thread lock if your switch uses screws with metal-to-metal contact. DO NOT use thread lock if your screws thread into plastic!



- ☐ 7. Install and route two 12in (305mm) servo extensions (FPZA1045) for the MPX harness from the bottom wing openings. Secure the extension as appropriate using cable ties.



- ☐ 8. Make all the servo connections. Depending on balance (read CG section), install your (2) recommended batteries in one of the 3 tray the Mamba has. Secure them using hook and loops straps. If you are using Aura 8 Pro your final installation would look like the picture above.



- ☐ 9. If using dual receivers with the Aura 8 Pro we recommend mounting them as far away from each other as possible to provide for the best reception. The RX's are shown here in front of the Aura and in the turtle deck of the airplane for maximum RF strength.



- ☐ 10. If using a pilot figure, install it in the canopy at this time.

FIELD ASSEMBLY

Details on field assembly are covered in the assembly video that is provided on the Mamba 70cc G2 page at:

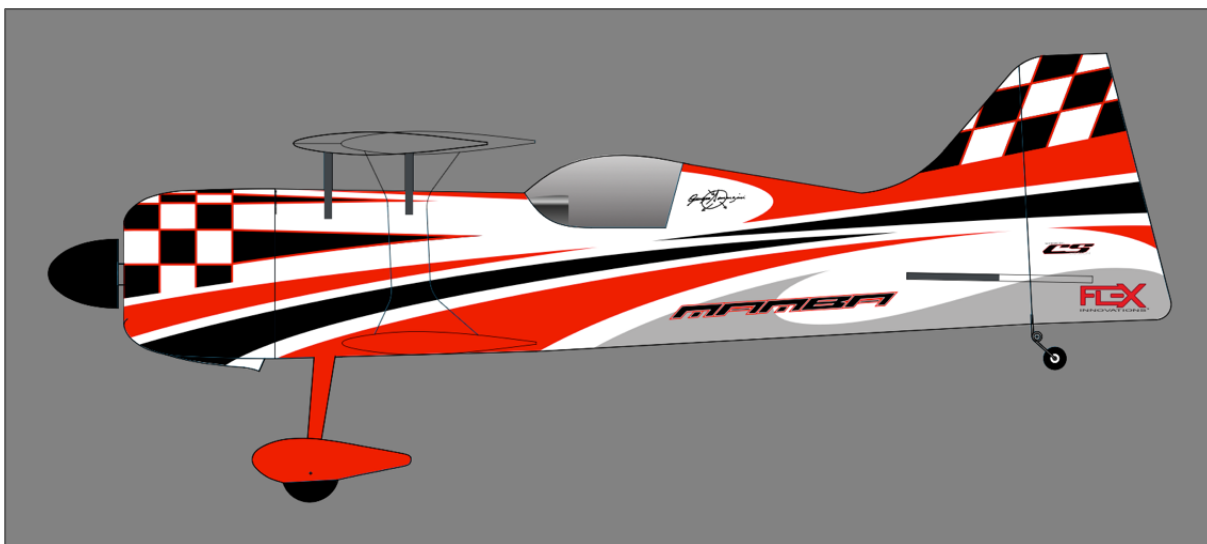
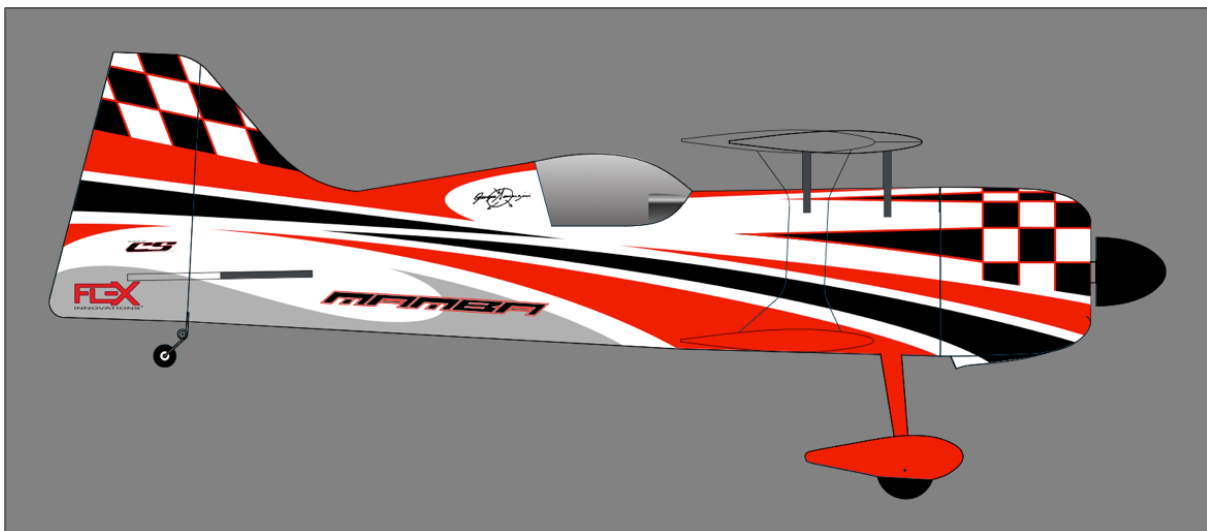
<https://www.flexinnovations.com/product/mamba-70cc-g2/>

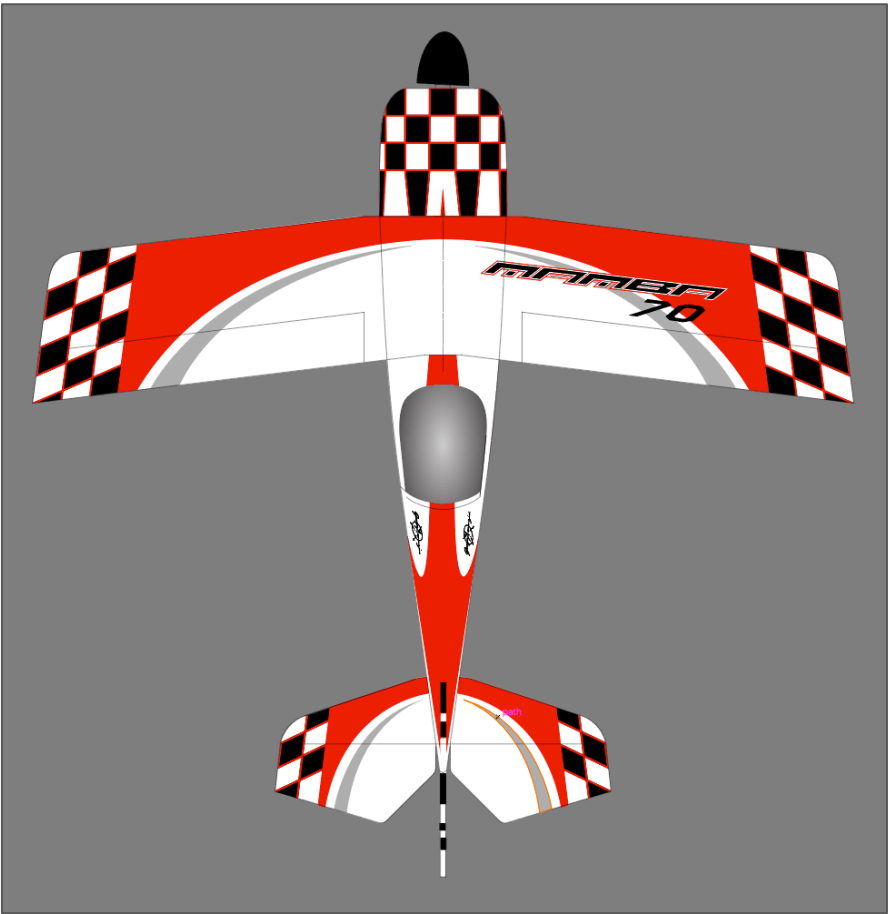


DECAL INSTALLATION

A traditional set of clear decals is provided with the Mamba 70cc G2. Use the drawings provided below for a guide to apply 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. Peel the backing from the decals and place them in the desired position. If the decal is not quite right, you can remove it and re-position it.
- ☐ 4. Repeat the process until all decals are applied. The adhesive on the decals will cure over time and the bond will become durable.





FINAL SETUP AND FLYING NOTES

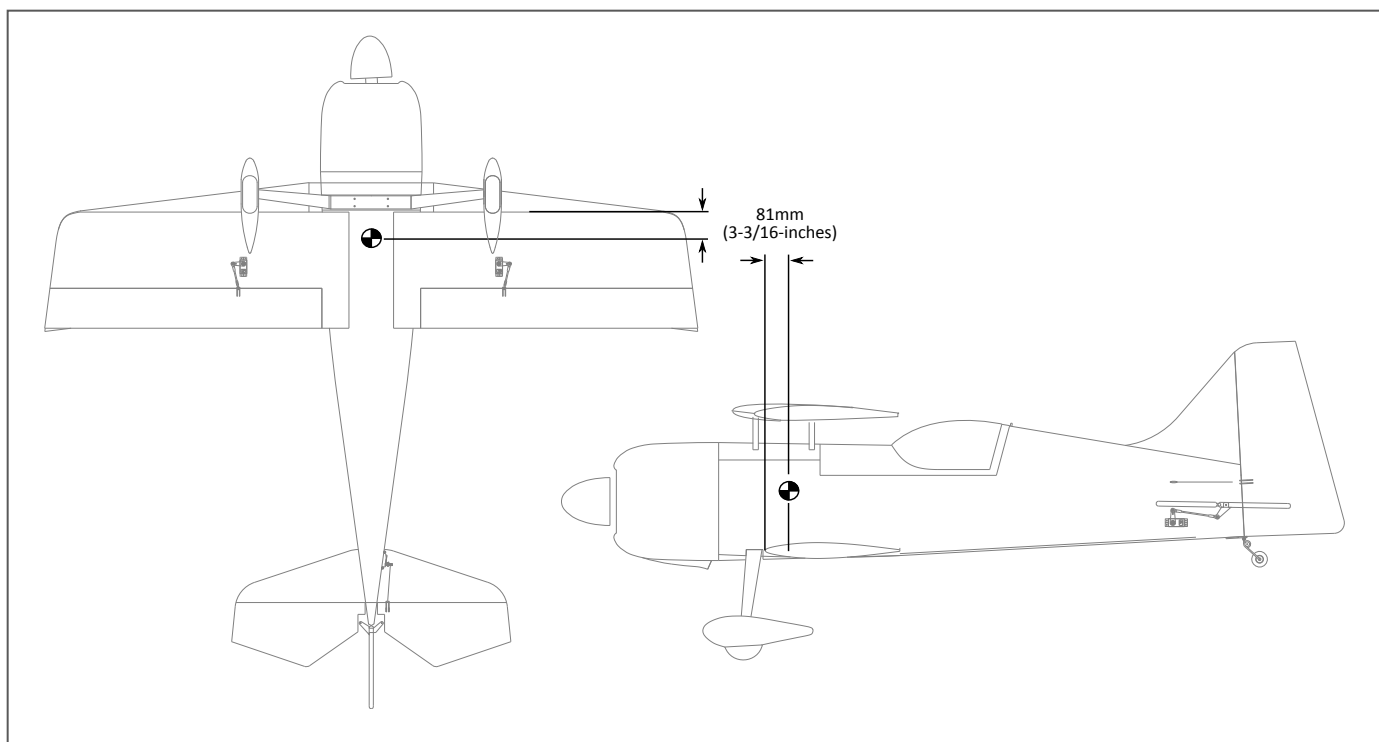
CENTER OF GRAVITY

Setting the center of gravity (CG) is one of the most important steps for success, particularly with a new airplane. The Flex Innovations Mamba 70cc G2 is a high-performance airplane with large control surface throws, and a very high thrust to weight ratio. These two factors combined make the Mamba a very enjoyable aircraft to fly, but if the center of gravity is not within an acceptable range, it will make the airplane difficult, if not impossible, to control. To have the most success and enjoyment from your Mamba 70cc G2, please follow the next few steps very carefully.

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, 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. If lifting the model by the wing tips, do NOT lift directly from the tip of the wing, but lift at the outboard-most wing rib location or damage to the model may result.

The location of the center of gravity for the Mamba 70cc G2 is between 78mm (3-1/16-inches) and 84mm (3-5/16-inches) with a recommended CG of 81mm (3-3/16-inches) AFT from the LEADING EDGE of the BOTTOM WING. It is critical that the starting point for your model be at this point. This measurement is determined from many test flights by designer, and many time world aerobatic champion, Quique Somenzini.



Quique's Tip:

CG can be easily achieved using the recommended equipment and placing it in the recommended areas. However, some variance of weight between model builds is possible. For this reason, it is recommended to leave the batteries uninstalled and finalize their installation where necessary, at the time you are setting CG in the recommended location. There are two trays in the aircraft. The gas tank tray, and the rudder/RX tray. Use these trays to place your batteries accordingly.

AURA 8 PROFESSIONAL

If you choose to use Aura 8 Professional AFCS, you can find the information on the Mamba 70cc Aura set-up in the Aura Config Tool and in the model setup wizard.

Note: the Aura configuration for the Mamba 70cc G1 and G2 are the same.

STARTING CONTROL SURFACE THROWS AND EXPONENTIAL

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 Mamba 70cc G2. 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: Throws are provided as angles of deflection in degrees. Special meters are available for measuring this angle, and you can certainly use one of these, but we have found that you can get an accurate enough measurement by using a phone and an angle or protractor app.

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.

Mamba 70cc G2 Control Throws and Expo

	Low Rate		High Rate	
	Up or right	Down or left	Up or right	Down or left
Aileron (top & bottom wing)	26 degrees	25.5 degrees	40 degrees	39 degrees
Elevator	14 degrees	14 degrees	52 - 55 degrees	52 - 55 degrees
Rudder	27 degrees	27 degrees	Maximum possible before elevator contact	
Aileron Expo	25%	25%	45%	45%
Elevator Expo	25%	25%	40%	40%
Rudder Expo	20%	20%	45%	45%

High rate should be reserved for 3D aerobatics and low rate should be reserved for sport/precision flying and general aerobatics. It is highly recommended that for your first flights, take offs and landings be done in low 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

FPM001190A	Mamba 70cc G2: ARF Red Scheme
FPM00119050A	Mamba 70cc G2: ARFSV Red Scheme
FPM0011901A	Mamba 70cc G2: Fuselage without hatches Red Scheme
FPM001109024A	Mamba 70cc G2: Forward Hatch Red
FPM00119006A	Mamba 70cc G2: Canopy with cockpit installed, no pilot Red Scheme
FPM001109026	Mamba 70cc G2: Pilot Red scheme
FPM00119005A	Mamba 70cc G2: Cowling Red Scheme with hardware
FPM001109025A	Mamba 70cc G2: Fiberglass Engine Baffle Kit
FPM001109029	Mamba 70cc G2: clear cowling template
FPM001109023A	Mamba 70cc G2: Bottom Wing Set (Bottom, Left and Right) Red Scheme
FPM00119002A	Mamba 70cc G2: Top Wing Set Red Scheme (Top, Left and Right) NO CENTER SECTION
FPM001109031	Mamba 70cc G2: Top wing center Section Red Scheme
FPM00119017A	Mamba 70cc G2: Metal cabane struts - Red Scheme
FPM00119016A	Mamba 70cc G2: Interplane Strut Set Red Scheme with strut-pins
FPM00119009	Mamba 70cc G2: Carbon Wing Tubes (x2),
FPM00119003A	Mamba 70cc G2: Horizontal Stabilizer with Elevators Set Red Scheme
FPM00119004A	Mamba 70cc G2: Rudder Red Scheme
FPM001109032	Mamba 70cc G2: Removeable Rudder Wire
FPM001190013	Mamba 70cc G2: Pushrod Linkage/Control Horn Set
FPM001190014	Mamba 70cc G2: Hardware Set
FPM00119015A	Mamba 70cc G2: Decal Sheet Red Scheme
FPM00119018	Mamba 70cc G2: Laser Cut Wood Parts
FPM2019	Lightweight 24oz Fuel/Smoke Tank
FPM00119007A	Mamba 70cc G2: C/F Landing Gear for Red scheme
FPM00119008A	Mamba 70cc G2: Wheel Pants with hardware Red Scheme
FPMA1077	Mamba 70cc G2: Tail Wheel with Hardware
FPMA1076	Flex 70cc Main Wheel Set and Axle Set (NEW HARDENED STEEL AXLE)

OPTIONAL ACCESSORIES

FPM001109026	Mamba 70cc G2: Pilot Red scheme
FPMA1079	5-inch Parabolic Carbon Fiber Spinner - Checkerboard black and white
FPMA1027	5-inch Parabolic Carbon Fiber Spinner
FPM357018	Premium Wing Bag – RV-8 60E & MAMBA 70cc
FPMDA70	Desert Aircraft DA-70 Engine
FPMDA70MUFLR	Desert Aircraft DA-70 Muffler Set
FPMGP76	GP76 with Mufflers
FPZMEMDA70H15	Flex/Dualsky 15mm/70cc Standoff Kit
FPMPFC2890CF	Falcon 28x9 Carbon Fiber Propeller
FPM2019	Lightweight 24oz Fuel/Smoke Tank (for Smoke
DP1000	Dualsky DP1000 Brushless Smoke Pump
FPMA1051	70cc Smoke System Completion Pack
FPZDS49010BLHV	Potenza DS49010BLHV Brushless Servo (Flight Surfaces)
FPZDS19410HV	Potenza DS19410TGHV Digital Servo (Throttle)
FPZA0005B	Potenza 1.25-inch Clamping Servo Arm (25T)
FPZA1037	Aluminum Servo Arm, 4-inch, Clamping (25T)
FPZA1040	Servo Connector Safety Clip
FPZAURA08PRO	Aura 8 Professional AFCS
FPZBR20002S15	2000 mAh 2s 15C JR/EC3 Connector RX Li-Po Battery Pack

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

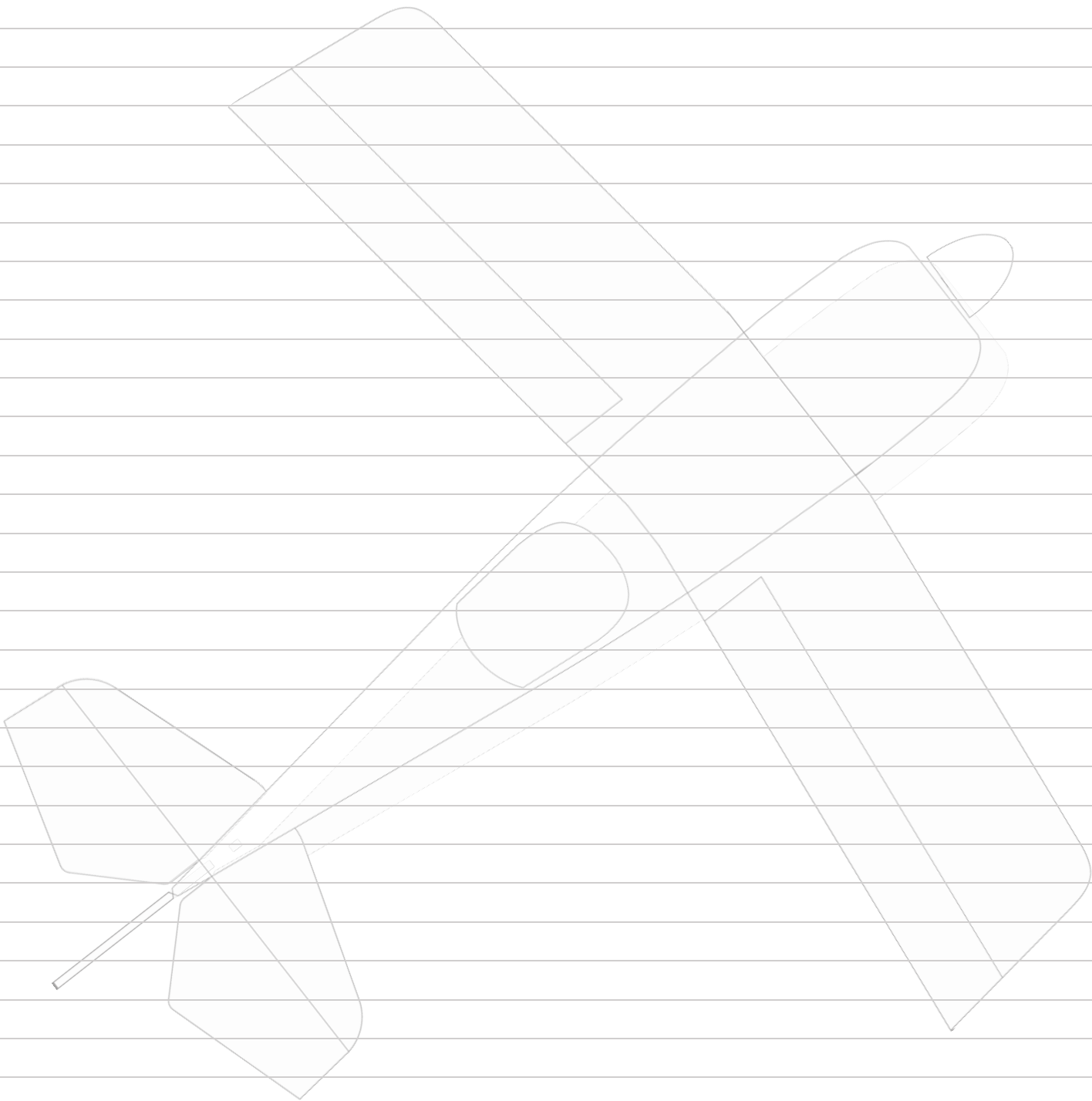
For Warranty consideration, you must include your original sales receipt verifying the proof of purchase date. Provided any warranty conditions have been met, your Product or its defective parts will be replaced or serviced free of charge. Responsibility of shipping charges are as follows:

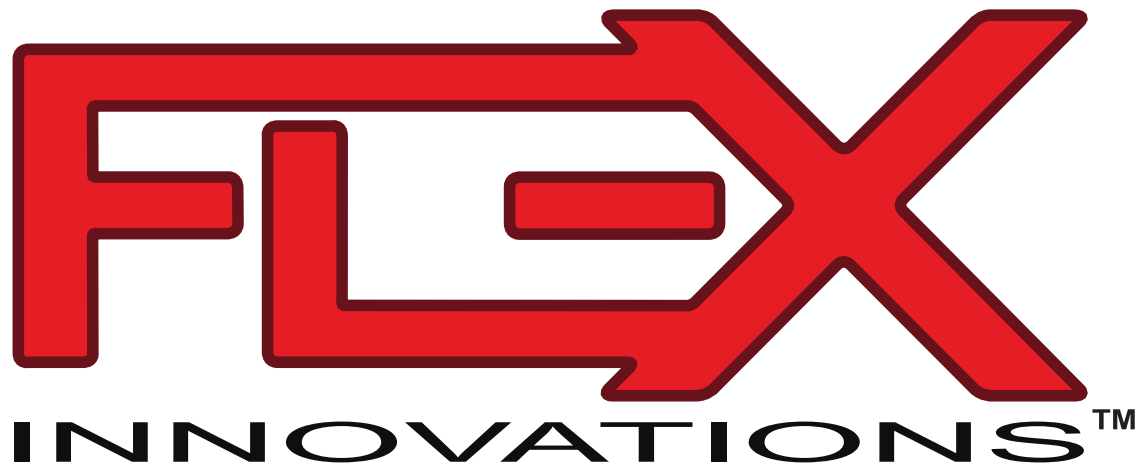
To Flex from customer, customer is responsible.

To Customer from Flex, Flex is responsible.

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

BUILDING AND FLYING NOTES





© 2026 Flex Innovations, LLC. All rights reserved.
Potenza™ is a trademark of Flex Innovations LLC

Rev. A
Created 03/2026