

QEXTRA 300



SUPER PNP
Instruction Manual

PREMIER
aircraft™

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INTRODUCTION

QQ Extra 300 and Aura 8: the perfect combination!

The QQ Extra 300 - it is the evolution and accumulation of many years of experience in the aerodynamic and electronic control stabilization world. A perfectly balanced airframe design combined with today's most advanced control system gives an unmatched flying experience.

Pilots will feel smooth, precise aircraft control without any interference to pilot inputs. The aircraft will fly as if it were much larger, turbulent air will be less noticeable, rotations will stop more precisely and landing will be easier to execute. Flex Innovations has tuned and matched both to their best potential, however, the Aura 8 programming capability allows total freedom to the pilot to adjust (including setting flight modes that can switch it off). USB firmware update capability allows you to enjoy and benefit from the latest features and advancements.

- Available in blue/yellow and red/silver schemes
- Low wing loading offers superb stability at slow speed
- Custom-tuned Aura 8 gyro stabilization system provides the ultimate in stability and control
- Powerful 10-sized motor provides the punch for demanding aerobatics
- High-precision digital servos with full metal gears
- Light weight EPO foam is stiff and tough
- Hollow carbon and plywood-reinforced wing is stiff and lightweight
- CA hinges for high throw and low resistance
- Custom-designed control horns to maximize control surface throw and precision
- Wheel pants to enhance the scale looks

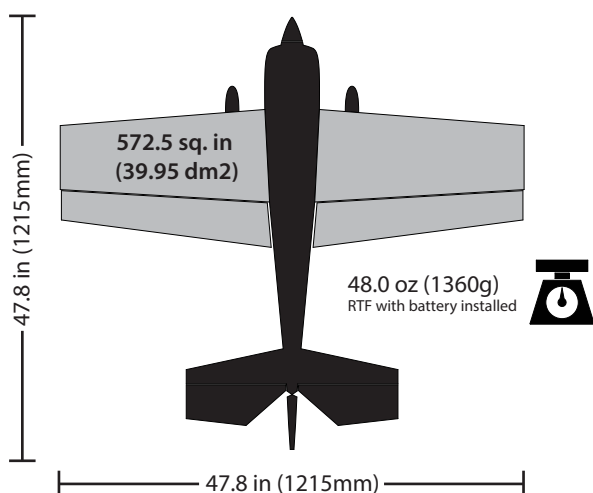
BOX CONTENTS



REPLACEMENT PARTS LISTING

FPM3070A	QQ Extra 300 Super PNP Blue Scheme
FPM3070B	QQ Extra 300 Super PNP Red Scheme
FPM307001	QQ Extra 300: Fuselage
FPM307002	QQ Extra 300: Wing set SFG Included
FPM307003	QQ Extra 300: Tail set
FPM307004	QQ Extra 300: Hatch set / Cowling
FPM307005	QQ Extra 300: Landing gear set
FPM307006	QQ Extra 300: Tube Joiner set
FPM307007	QQ Extra 300: Pushrod set
FPM307008	QQ Extra 300: Red/Silver Decal Set
FPM307009	QQ Extra 300: Blue/Yellow Decal set
FPM307010	2 Blade black spinner 55mm
FPZM1010A1	5mm Collet Prop Adapter
FPZM1010A2	Potenza 10 Aluminum X-Mount w/Screws
FPZM1010A3	Potenza 10 5mm Motor Shaft W/Collar

SPECIFICATIONS



BATTERY CHARGING GUIDELINES

The assembly of the QQ Extra 300 can be accomplished in less than twenty minutes, even for a novice. Prior to assembling the airplane, it is advisable to charge your battery so that you are ready to fly upon completion of the assembly of your model.

We recommend the use of an advanced LiPo balancing charger, such as our Potenza C80 Multi Chemistry Touch Screen AC/DC balancing charger for your batteries to get the maximum performance and lifespan from them.

Our airplanes are designed around our Potenza LiPo batteries and we recommend the Potenza 3S 2200mAh 40C LiPo in the QQ Extra 300 based on our extensive testing and development. This battery features an EC3 connector, so no soldering is required for use in your Extra.

Both are available at your Flex Innovations retailer.

COMPLETION ITEMS

INSTALLED!		Potenza 10 1350 Kv Brushless Outrunner Motor (FPZM1010A)
INSTALLED!		HobbyWing Skywalker 40A ESC w/ 3A BEC (FTVHWBQ8004B)
INSTALLED!		Potenza DS19 Digital Full Metal Gear 19g Servo (FPZDS19)
INSTALLED!		Aura 8 Advanced Flight Control System (FPZAURA08)
INCLUDED!		SR 11.5x4.5 Thin Electric Propeller (FPMP11545E)
NEEDED TO COMPLETE		2200mAh 3S 11.1v 40C LiPo (FPZB22003S40) 3S 11.1v 2100-3300mAh minimum 30C LiPo
NEEDED TO COMPLETE		6-Channel Computer Transmitter*
NEEDED TO COMPLETE		DSM2/DSMX satellite S.Bus Futaba/Graupner HOTT/ JR XBus Rx 5+ Channel RX (any brand)

*DX4/5e class transmitter supported with special model program download

Potenza C80 AC/DC Charger (FPZC80)

- Large touch screen and intuitive software for ease of use
- Convenient AC/DC operation
- Multi-chemistry operation charges LiPo (1-6S), LiFe (1-6S), Li-Ion (1-6S), NiMH (1-16 cells), NiCd (1-16 cells), Pb (1-10 cells) batteries
- Automatic lithium chemistry balance charge cell detection
- 10 pre-programmed memory programs and 8 user-programmable memories



Potenza 3S 2200mAh 40C LiPo (FPZB22003S40)

- Capable of up to 40C (88.0A) maximum continuous discharge
- JST-XH balance connector and EC3 power lead connector are compatible with a wide range of aircraft and chargers
- Maximum 3C (6.6A) charge rate



WARNING

FOLLOW ALL INSTRUCTIONS PROVIDED BY YOUR BATTERY AND CHARGER MANUFACTURER. FAILURE TO COMPLY CAN RESULT IN FIRE.

SPECIAL LANGUAGE DEFINITIONS

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

- NOTICE:** Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.
- CAUTION:** Procedures, which if not properly followed, create the 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.



WARNING

AGES 14+

This product is not intended for use by children under 14 years without direct adult supervision.

ATTENTION

Read the ENTIRE instruction manual to become familiar with the features of the product before operating. 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, Inc. For up-to-date product literature, please visit our website at www.flexinnovations.com and click on the QQ Extra 300 and Aura 8 product pages.

IMPORTANT INFORMATION REGARDING WARRANTY

Please read our Warranty and Liability Limitations 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 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 and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or serious injury.
2. This model is not a toy, rather it is a sophisticated 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.
3. This model must be assembled according to these instructions. Do not alter or modify the model outside of these instructions provided by Flex Innovations, Inc, as doing so may render it unsafe and/or unflyable. It is your responsibility to ensure the airworthiness of the model.
4. Inspect and check operation of the model and all its components before every flight.
5. 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.
6. Keep the propeller area clear from such items such 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.
7. Never fly in visible moisture or submerge the airplane or any of its electronic components in water. Permanent damage to electronic components may occur, or corrosion of components may lead to intermittent failures.

LOW VOLTAGE CUTOFF

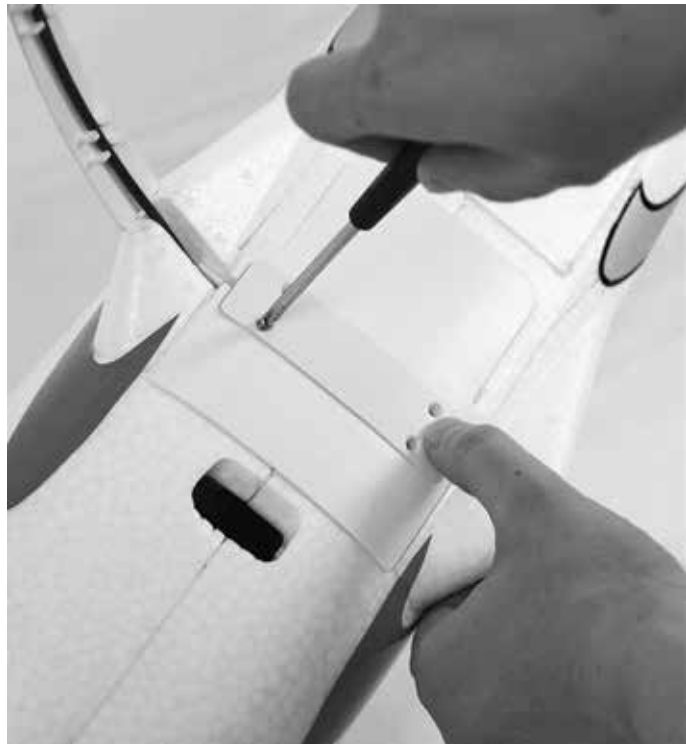
LiPo batteries have a nominal (rated) voltage of 3.7v per cell, and fully charged, reach 4.2v per cell. Batteries are designed to be discharged below the nominal voltage, however, if they are discharged below 3.0v per cell, damage will occur and the pack will lose capacity. For best long term battery life, set a timer and land after a time that leaves approximately 15% of the battery's capacity remaining.

Low voltage cutoff is a feature that is built into the Hobby Wing SkyWalker 40A ESC that is designed to protect the connected battery from being discharged too far and causing permanent damage to the cells. Circuitry within the ESC will automatically detect when the input voltage from the battery pack reaches below 3.15v per cell (average) and will remove power to the motor, but still deliver power to the servos so that a safe landing may be made. If the motor begins to lose power rapidly during flight, the LVC has sensed that the total voltage of the pack has dropped below 3.15v per cell average, and the airplane should be landed immediately.

MAIN LANDING GEAR INSTALLATION

Required Tools and Fasteners: #1 Phillips Screwdriver, (4) M1.5x5 self-tapping screws

1. Insert the landing gear assembly into the slot in the bottom of the fuselage. The gear will sweep forward.
2. Install the cover plate over the landing gear slot and attach with (4) M1.5x5mm self-tapping screws.



TAILWHEEL INSTALLATION

Required Tools and Fasteners: #1 Phillips Screwdriver, (3) M1.5x5 self-tapping screws

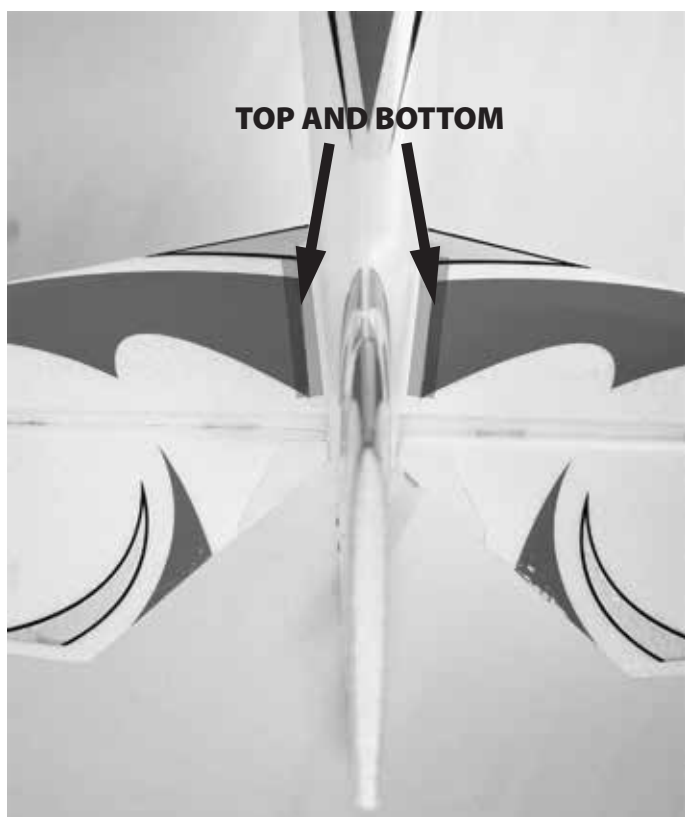
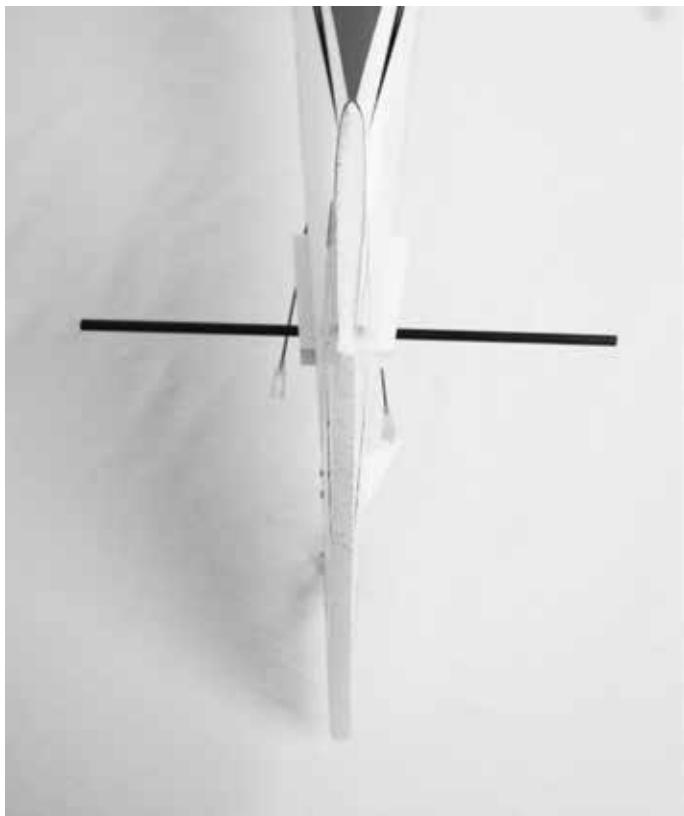
1. Insert the tailwheel assembly in the slot in the bottom of the rudder.
2. Install the cover plate over the tailwheel slot and attach with (3) M1.5x5mm self-tapping screws.



HORIZONTAL STABILIZER INSTALLATION

Required Tools and Fasteners: Clear Tape (4 strips)

1. Insert the horizontal stabilizer tube into the fuselage and roughly center.
2. Slide the left and right stabilizer halves onto the tube. Ensure that the control horn orients towards the belly of the airplane and that the elevator joiner tabs are properly indexed. Do not force the stabilizer into place.
3. Apply 4 pieces of clear tape to the joint between the stabilizer and the plastic mounts. Be sure to apply tape to both the top and bottom.
4. Attach the clevis to the elevator control horn in the innermost hole. Slide the clear tubing over the forks.



MAIN WING INSTALLATION

Required Tools and Fasteners: #1 Phillips Screwdriver, (2) M2.5x10mm self-tapping screws

1. Remove the belly hatch by peeling back the tape at the rear of the hatch.
2. Install the wing tube into the fuselage.
3. Slide the left or right wing panel on the wing tube and guide the servo wire into the fuselage.
4. Invert the airplane so that the belly is facing up. Secure the wing to the fuselage with (1) M2.5x10mm self-tapping screw.
5. Slide the wing tube into the installed wing panel until it bottoms out. **DO NOT FORCE THE TUBE INTO THE WING.**
6. Slide the other wing panel guiding the servo wire into the fuselage.
7. Secure the wing to the fuselage with (1) M2.5x10mm self-tapping screw.
8. Use a small piece of music wire with tip hook shape to fish the aileron servo lead through the hole as shown in picture below.

NOTE- Take special caution to prevent the aileron servo extension from being pinched when installing the wing panels.



AURA 8 ACFS

- Works conveniently with all major radio systems
- Accepts signals from DSM Satellite(s), Futaba S.Bus , Graupner Hott, JR XBus, PPM stream, or any brand of Rx via male to male servo connectors
- Expertly tuned and ready to use
- USB port allows loading model configurations, user programming, and firmware updates (cable included)
- Flexible and extensive programming through PC or mobile device (iPhone®/Android™)
- 3+ flight modes allow precise or aggressive settings to be selected in flight
- 3-axis gyro utilized in QQ Extra 300 programming
- Powerful 32-bit processor and 6 axis sensor for future updates and re-use

The Aura 8 advanced flight control system installed in your QQ Extra 300 is a giant leap forward in aircraft flight control system technology. Compatible with virtually every receiver on the market today via PWM connections, the Aura features special configuration for DSM systems via remote receiver connection, and serial data connection for Futaba S.Bus, Graupner HOTT, and JR XBus systems.

The Aura 8 advanced flight control system in your QQ Extra has been pre-tuned for ease of use, eliminating many hours of setting gains. For the latest Aura Features, programs, transmitter downloads, and instructions, please visit www.flexinnovations.com/aura.

The Aura is programmable through either PC or mobile device and every axis has independent gain adjustment and by each flight mode. All dual rate, expo, travel, and mode programs are adjusted inside the Aura through the PC/mobile application. An assignable master gain that is **OFF** by default can be enabled by the Aura application. If desired, assign it to CH 8/AUX 3 on a proportional dial or slider.

By default CH5/Gear is used to select the 3 flight modes by 3 position transmitter switch.

RECEIVER INSTALLATION/SERVO CONNECTIONS

For the latest Aura Features, programs, transmitter downloads, and instructions, please visit www.flexinnovations.com/aura. To connect modern data-linked receivers, follow these instructions. For traditional PWM receivers, refer to the connection diagram at the bottom.

1. Plug the left aileron servo into the S2 port on the Aura 8 and the right aileron servo into the S3 port.
2. Install the receiver in the fuselage using either Velcro tape or double-sided foam tape (not included)
3. Connect the receiver to the Aura 8 using the appropriate connection illustrations below.

DEFAULT CONNECTIONS ‡	
S1	Throttle (ESC/BEC)
S2	Left Aileron
S3	Right Aileron
S4	Elevator
S5	Rudder

DSM2/DSMX REMOTE RECEIVER

Connect one remote DSM2/DSMX receiver to antenna port 'A' on the side of the unit. Attach the remote receiver securely to the fuselage using hook-and-loop tape or double sided foam tape.



FUTABA S.BUS/GRAUPNER HOTT/JR XBUS CONNECTION

Connect the included male to male extension to the receiver's data port and connect to port 'B' on the face of the unit. Refer to your radio manufacturer's instructions for specific information on appropriate serial port connections and system settings.



PWM (TRADITIONAL) RECEIVER PORT CONNECTIONS

Refer to the chart below for channel mapping for traditional receiver connections for receivers not specifically supported. Male to male extensions* are used for the following connections.

CONNECTIONS IN		CONNECTIONS OUT	
RECEIVER	AURA 8	AURA 8	CONTROL SURFACE
Aileron	S1	S5	Left Aileron
Elevator	S2	S6	Right Aileron
Rudder	S3	S7	Elevator
CH 5 (Gear)	S4	S8	Rudder

*(FPZAU01 3pc Male to Male Servo Cable/S.Bus) not included | ‡ non-PWM connections

Lead to ESC/BEC

ESC WILL CONNECT DIRECTLY TO THE RECEIVER. NO CONNECTION FROM THE AURA TO RECEIVER WILL BE MADE FOR THE ESC.

Leads to flight control servos



WARNING

DO NOT ATTEMPT RADIO SETUP WITH PROPELLER INSTALLED. INADVERTENT POWER UP COULD CAUSE PERSONAL INJURY.

TRANSMITTER SETUP

The Aura 8 on QQ Extra 300 defaults to 3 flight modes that are changed via transmitter CH5/Gear which is assigned to a 3-position switch of your choice.

Description of Pre-Loaded Aura Flight Modes

Mode 1: Flight Control system is off. Rates are set for general flight (same as FM 2). Exponential is tuned for comfortable flight.

Mode 2: Flight Control system is on. Gains are moderate and tuned for comfortable feel/best performance for precision aerobatics. Expo is tuned for comfortable flight.

Mode 3: Flight Control system is on. Gains are highest and tuned for 3D aerobatics. Rate are set to highest. Exponential is tuned for comfortable flight.

Each of the modes has been tuned by our team to offer a solid start. Because tastes in control feel are unique, if changes in rate and expo are needed adjustments may be made through either the transmitter or Aura 8. Changes on gain value may only be made through the Aura.

For large (>5%) changes in expo, either (1) make a change in the Aura programming, or (2) zero expo values in the Aura and rely on transmitter programming for expo values.

After initial setup is complete, power up the model and bind the receiver to the transmitter using the instructions provided by the radio manufacturer.

To bind a DSM connection utilizing a remote receiver, insert a bind plug in Aura port S8. Power the model and follow the instructions from the transmitter manufacturer. Remove and store bind plug to complete the process.

TRANSMITTER CONFIGURATION GUIDE

ATV Setup	Aileron/Elevator/Rudder	125%
	Throttle	100%
Sub Trim	Verified neutral, sub trim not allowed	
Trim Levers	Verified neutral	
CH 5 (Gear)	Assigned to a 3-position switch	
Reversing	All channels normal	
Timer	Set to 4:30 for initial flights*	

AURA CONFIGURATION REFERENCE

		Mode 1	Mode 2	Mode 3
#Aura 8 Rate Setup	Aileron	▲▼ 40%	▲▼ 38%	▲▼ 100%
	Elevator	▲▼ 25%	▲▼ 25%	▲▼ 100%
	Rudder	▶◀ 100%	▶◀ 100%	▶◀ 100%
		Mode 1	Mode 2	Mode 3
#Aura 8 Expo Setup	Aileron	▲▼ 30%	▲▼ 15%	▲▼ 30%
	Elevator	▲▼ 25%	▲▼ 10%	▲▼ 25%
	Rudder	▶◀ 25%	▶◀ 20%	▶◀ 5%

*The QQ Extra 300 can fly anywhere between 4:00 to 6:30 depending on flying style

‡ The shown Aura 8 settings are pre-configured and the unit is ready to use. The chart shown is for information purposes only. No additional action is required to fly the airplane.

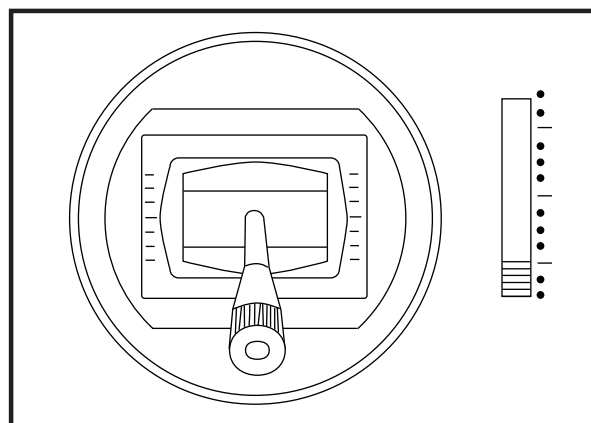
CONNECTING BATTERY/ARMING ESC

Observe the following procedures to safely power up your model after it has been bound. **Ensure propeller is removed unless sequence is followed to power up before flight.**

1. Lower the throttle stick and trim to their lowest setting and turn on the transmitter. Wait for your transmitter to indicate the RF signal is being broadcast before proceeding.

If a battery is connected to the ESC with the throttle fully open on the active transmitter, the ESC will enter into programming mode. If this occurs, simply disconnect the battery, lower the throttle, and reconnect the battery.

2. Ensure the rudder, elevator, and aileron gimbals are centered.
3. With the airplane on a solid surface; connect the battery to the ESC and wait. The ESC will emit a series of audible tones during its initialization process.
4. The ESC will emit a short, final tone sequence indicating that the ESC is now armed.



CAUTION

Always connect the battery when the throttle and throttle trim are in the cut-off position.



WARNING

When making adjustments to linkages, transmitter settings, or the Aura 8 flight control system, remove the propeller to guard against accidental spool up.



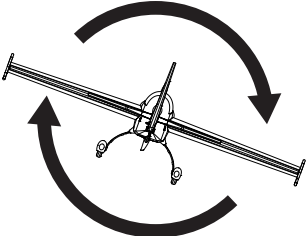
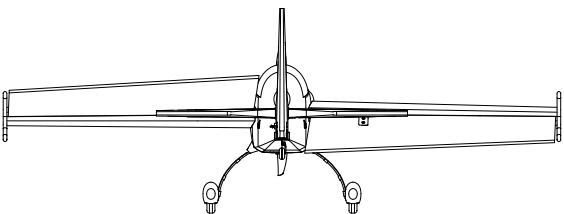
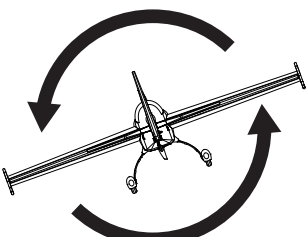
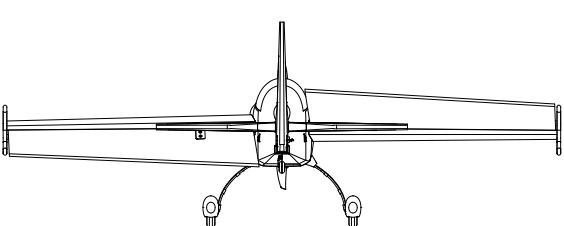
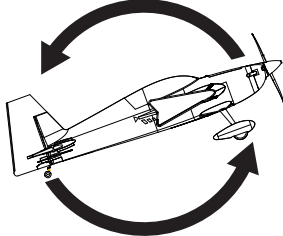
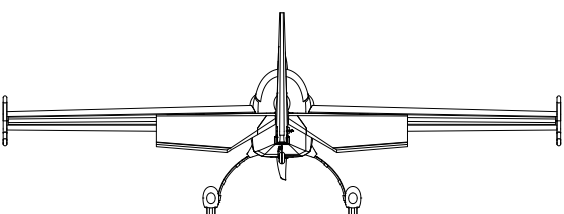
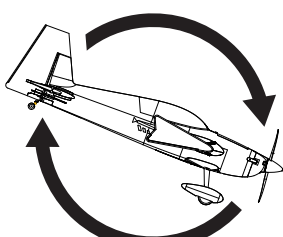
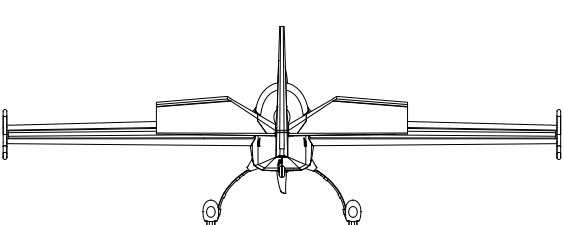
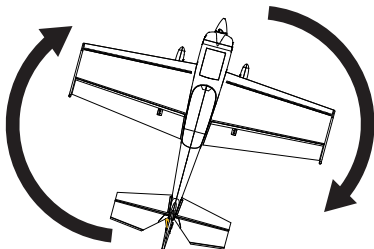
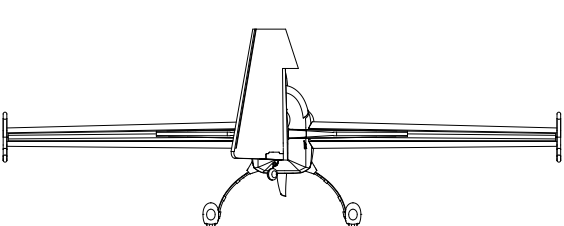
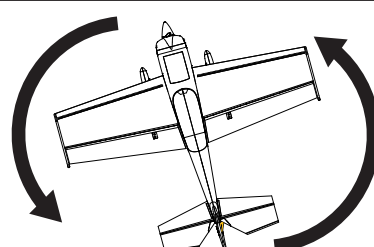
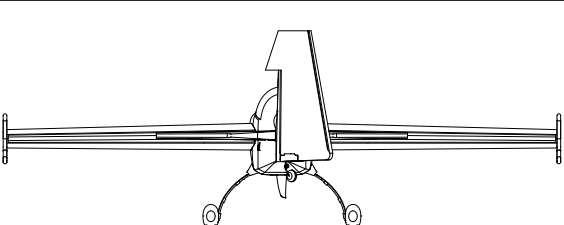
WARNING

Hold aircraft securely when connecting the battery before flight. Always ensure that the propeller is clear of any and all objects as they may become entangled.

FLIGHT CONTROL SENSING DIRECTION TEST

Perform a test of the gyro system to verify the corrections made for a given movement are correct. If any of the tests do not result in the correct reaction from the airplane's gyro system, **do not fly the airplane**, and refer to the Aura 8 manual for more information.

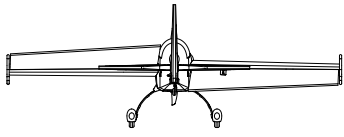
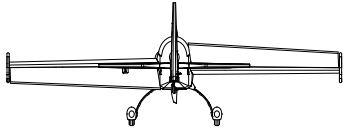
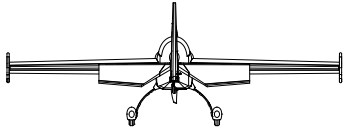
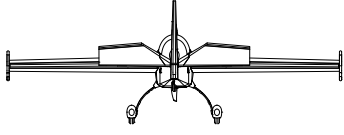
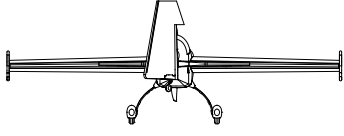
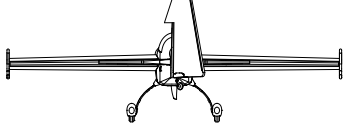
The flight control system activates with RF broadcast. Perform these tests in Mode 3 (higher gain) for better visibility and then in Mode 2, and any other modes that have gyro gains assigned. (By default, Mode 1 has no gain assigned.). Control surface deflections are exaggerated in the drawings below for clarity.

	Aircraft Movement	Proper Control Surface Deflection
AILERON		
		
ELEVATOR		
		
RUDDER		
		

CONTROL DIRECTION TEST

Refer to the chart at right to determine the proper control surface direction. Reversed controls may be corrected in either the transmitter’s servo reverse menu or through the Aura 8 app in the outputs section.

After any adjustments, repeat the flight control sensing direction test, and the control direction test to confirm that all control surfaces respond according to the correct corresponding stick movement.

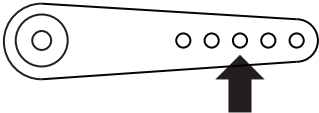
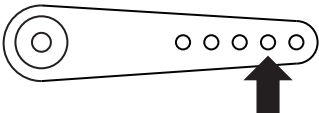
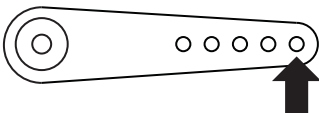
		Transmitter Command	Proper Control Surface Deflection
AILERON		Stick Left	
		Stick Right	
ELEVATOR		Stick Forward	
		Stick Aft	
RUDDER		Stick Left	
		Stick Right	

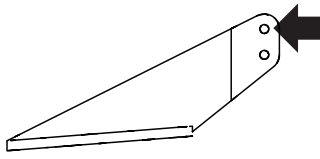
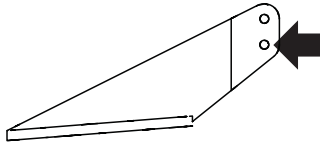
LINKAGE SETUP

Adjust the control linkages so that the surfaces are neutral with zero trim and zero subtrim. Adjustments may be required during flight trimming – for more information, please refer to the trimming section located on page 13 of this manual.

At the servo, the stock linkage attachment is a Z-bend located in the outermost hole in the servo arm for the rudder, the second hole in from the outside for the elevator, and the third hole in from the outside for the ailerons.

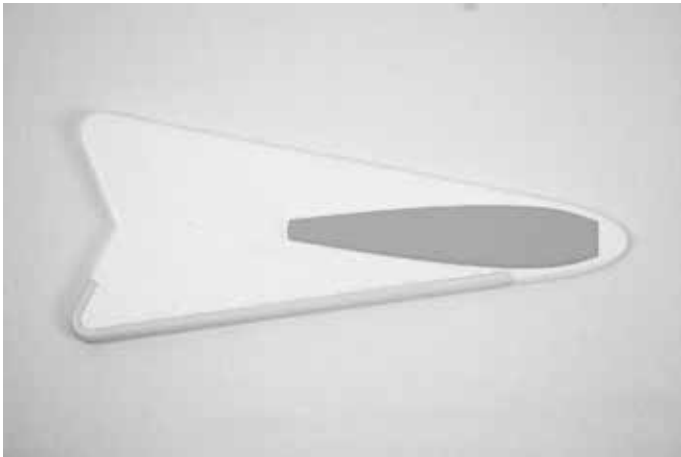
At the control horn, the stock attachment is a nylon clevis located in the outermost hole for aileron, and innermost hole for rudder/elevator.

SERVO ARMS	AILERONS	
	ELEVATOR	
	RUDDER	

CONTROL HORNS	AILERONS	
	RUDDER/ELEVATOR	

SFG INSTALLATION

1. Liberally apply medium CA (cyanoacrylate adhesive) to the airfoil-shaped mounting plate on the inside of the SFG.
2. Insert the SFG into the molded cavity in the wingtip and press tightly. NOTE- the plastic skid is on the **BOTTOM** of the SFG.



PROPELLER/SPINNER INSTALLATION

Required Tools and Fasteners: #1 Phillips Screwdriver, 13mm Box Wrench, M3x6mm machine screw

1. Insert the prop collet onto the motor shaft. Ensure that it is fully seated.
2. Temporarily remove the prop nut and washer and install the propeller with the convex surface facing forward. The propeller size numbers are printed on the front face of the prop and should orient forward.
3. Slide the prop washer on the collet with the widest face aft, and tighten the prop nut.

NOTICE

Because the spinner does not have a backplate, spin the motor over by hand to ensure that the spinner is true after installation.



BATTERY INSTALLATION

1. Push the spring-loaded battery latch tab back to release the battery hatch.
2. **OPTIONAL- Apply a strip of adhesive-backed hook-and-loop fastener (not included) to the bottom of your battery and battery tray.**
3. Press the battery to the center of the battery tray and secure with the provided hook-and-loop strap.
4. Reinstall the hatch, and confirm that the latch has positively engaged.



⚠ CAUTION

Always keep limbs clear from the propeller when the battery is connected. After the ESC arms, the propeller will rotate when the throttle is moved. Unlike an internal combustion engine, electric motors apply more voltage to counteract resistance, therefore any object that is entangled in the propeller will be severely damaged before the motor will stop

⚠ WARNING

When making adjustments to linkages, transmitter settings, or the Aura 8 flight control system, remove the propeller to guard against accidental spool up.

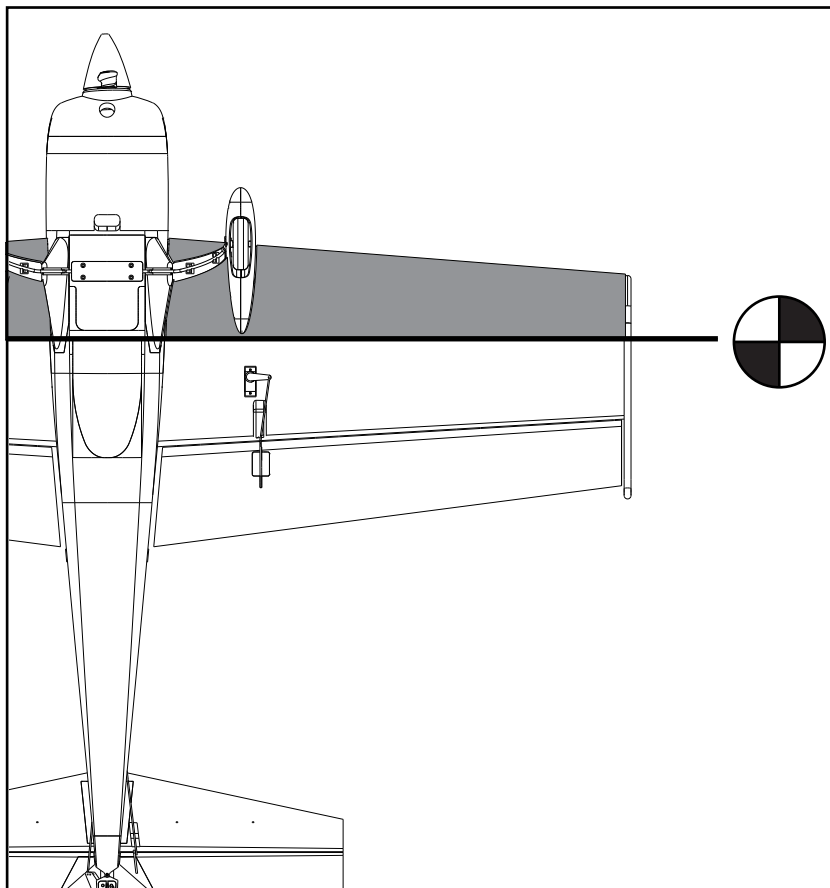
CENTER OF GRAVITY

The location of the center of gravity for the QQ Extra 300 is aligned with the **FRONT EDGE** of the **RADIO HATCH**. This measurement was determined from many test flights by designer and many time world aerobatic champion, Quique Somenzini. Lift the airplane from the underside of the wing to check the CG.

Setting the center of gravity is one of the most important steps for success, particularly with a new airplane. The Extra is a high-performance airplane with large control surface throws, and a high thrust to weight ratio. These two factors combined make it 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.

⚠ NOTICE

The CG measurement should be made with the completed airframe with all components (batteries, servos, receiver, linkages, screws, bolts, hardware, etc.) installed. Failure to do so will result in inaccurate measurement.



FLYING YOUR QQ EXTRA 300

Selecting a Flying Site

Selecting a flying site is critical to a successful flight. Airplanes require a lot more room than other R/C products, therefore, a neighborhood or parking lot is less than ideal. A large open field with short grass and generous overfly area are the best candidates if no AMA field is available in your area. Know your overfly area—ensure that there are no houses, playgrounds, or other buildings that may be damaged if the airplane were to crash.



Takeoff

Taxi or place the aircraft on the runway centerline, with the nose into the wind. Select Mode 2, then smoothly advance the throttle to full while maintaining directional control with the rudder and slight back pressure on the elevator. The airplane should lift off smoothly before the throttle is fully open. Fly in Mode 2 until the aircraft is fully trimmed (see special trimming instructions), and you are comfortable with its handling, then explore the other modes as desired.

Flying

Altitude is your friend on the first flight. Briskly climb to a safe altitude and trim the airplane out. The airplane should fly straight and level a 1/2 to 3/4 power with no hands on the transmitter. Try some basic maneuvers, and slowly progress into the airplane's flight envelope as you become more comfortable with the airplane's flight qualities and perfect your setup. **Note: If at any time, such as after gain adjustments, you experience unexpected control system inputs or oscillations, switch to Mode 1, and land and troubleshoot the issue. (Mode 1 turns the sensor inputs off with default programming)**

Trimming

The first several flights on your QQ Extra should be dedicated to trimming and setup. Fly the airplane at full power in **Mode 2** and trim for level flight. **Land, adjust linkages and return the trim and/or subtrim to zero and fly again. Repeat until the airplane flies hands off, straight and level.**

USE CAUTION WHEN FLYING YOUR QQ EXTRA IN MODE 3 AT HIGH AIRSPEEDS. DOING SO CAN INDUCE CONTROL SURFACE OSCILLATIONS AND MAY CAUSE A CRASH.

Landing

Be mindful of your flight time and allow adequate battery reserve for a couple of go-arounds, if necessary, on the first few flights. Select Mode 2 and slow the airplane and align with the runway, into the wind. The airplane should descend smoothly in this configuration with proper airspeed. Once you are close to the ground, gradually close the throttle fully and begin to smoothly apply up elevator as required to arrest descent and the airplane should gently touch down with a short roll out.

LEARNING TO FLY 3D WITH THE QQ EXTRA 300

The QQ Extra 300 was designed from the ground up to be a superior 3D aircraft. Pilot workload has been greatly reduced thanks to its finely tuned aerodynamic design to the incredible performance and pre-set configuration of the Aura 8 advanced flight control system, intermediate pilots will find that they are now able to do what they previously only dreamed of.

Sharpening Your Skills

Obviously before attempting any of these maneuvers, you should be proficient at flying an airplane. Practice orientation maneuvers—be able to fly the airplane anywhere you want upright, inverted, knife edge, flying towards yourself, flying away from yourself. Part of learning 3D is being able to bail out of a maneuver gone wrong consistently and safely.

A good 3D pilot will be smooth, but assertive in manipulations of all flight controls. Throttle and rudder are just as important to flying 3D as aileron and elevator. Competency with these controls is a must before progressing into 3D maneuver training.

After becoming proficient in basic aerobatics and being able to comfortably control the airplane in any flight attitude, you may progress on to some 3D maneuvers. At right, there is a list of some of the more common 3D maneuvers in practice today. These maneuvers are in order of increasing difficulty, so be sure to work into them in a logical progression. Once you master some of the more basic maneuvers, try your hand at more complex maneuvers and then practice variations of maneuvers and putting them into a sequence. There is no limit to the QQ Extra 300's performance envelope.

Harrier- The harrier is one of the most basic 3D maneuvers and is a good maneuver to start your training. A harrier is flown at a nose-high attitude (around 45°) while maintaining constant altitude and can be flown upright or inverted. Transition into a hover or into forward flight for recovery.

Hover- In a hover, the airplane is in a vertical attitude and is held in place by manipulating the throttle and flight controls to prevent the airplane from climbing or descending, and remain stationary. Transition into a harrier or exit into a vertical upline to recover.

Torque Roll- A torque roll is a slight modification to the hover. Instead of keeping the airplane in a stationary hover, the aileron is neutralized to allow the torque of the motor to rotate the airplane.

Waterfall- Waterfalls are accomplished by pivoting 360° in pitch with little or no altitude change or forward movement. Transition into a harrier or exit into a vertical upline to recover.

Blender- The blender is not a particularly difficult maneuver, but it is very dynamic and very impressive. From high altitude, the airplane enters a vertical downline at low throttle and rolls to the left. At a predetermined altitude (not too low!) an outside snap is initiated while simultaneously advancing the throttle to enter a flat spin. Ensure adequate altitude for recovery.

Harrier Roll- Harrier rolls are by far the most difficult 3D maneuver to perfect, but without a doubt are the most impressive to the idle bystander and R/C pilot alike. A harrier roll is as it sounds— a continuous aileron roll while performing a harrier. Many hours of practice are required to master this maneuver, and there are many variations to it as well.

AIRFRAME REPAIRS

The QQ Extra 300 is molded from durable EPO foam and is repairable with most adhesives. Similar to building and repairing wood or composite airplanes, the correct glue for a given application is critical to the repair holding and not breaking again. For major repairs, such as a broken fuselage, epoxy is preferred because it allows time to correct any misalignment. For smaller repairs, such as a cracked control surface or small chunk of material missing from the airframe, regular CA is very effective. The use of odorless (foam safe) CA is not recommended on EPO foam aircraft because it is weaker than regular CA and takes a longer period of time to cure and the bond tends to be weaker.

NOTE: Avoid the use of CA accelerant in repairs. It can damage paint and will weaken the bond of the glue. If CA accelerant is used, be mindful of the locations of CA to prevent premature bonding of parts, or bonding a hand or clamp to the airframe.

If a part is damaged too badly to be repaired, please refer to the front of the manual for a complete listing of spare airframe parts.

NOTICE: If a crash is imminent, fully reduce the throttle to prevent further damage to the power system and reduce energy to lessen impact damage. Never allow the propeller to contact the ground under power, even idle.

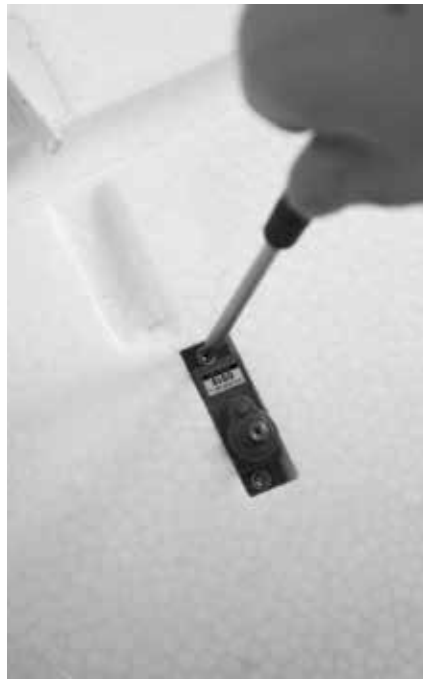
BE ADVISED THAT CRASH DAMAGE IS NOT COVERED UNDER ANY PRODUCT WARRANTY.

Avoid keeping the airplane in direct sunlight when not flying. Excessive heat can damage the airplane's structure and UV damage can permanently discolor decals.

REPLACING SERVOS

Required Tools and Fasteners: #1 Phillips Screwdriver

1. Unplug the servo from the receiver.
2. Unscrew the servo arm from the servo and remove the servo arm.
3. Unscrew the two mounting screws located at each end of the servo and remove.



TIP: Plug a spare extension lead into the servo when removing to make it easier to install the lead of the servo when replaced.

SERVICING THE POWER SYSTEM

Required Tools and Fasteners: #1 Phillips Screwdriver, 13mm box wrench

1. Remove the propeller and spinner assembly from the motor.
2. Remove the cowling by unscrewing the (2) M1.5x4mm self-tapping screws from the plastic mounts on the side of the cowling.
3. Gently pry the rear of the plastic mount upward to remove it from its base and then free the cowling from the fuselage.
4. Remove the (4) bolts holding the motor to the firewall using a #1 Phillips screwdriver. Disconnect the motor from the ESC.
5. To remove the ESC, simply unplug its lead from the receiver and the output leads from the motor.



OPTIONAL WHEEL PANT REMOVAL

For flyers that want the lightest possible setup, or that fly off of rough/unimproved fields, the wheelpants on the Extra are designed to be removable. Two wheel collars have been provided in the hardware bag to retain the wheels after the wheelpants are removed.

Required Tools and Fasteners: #1 Phillips Screwdriver, 1.5mm hex driver, (2) wheel collars

1. Invert the airplane and locate the two wheelpant retaining screws and remove them. Slide the wheelpants and tires off of the axles.
2. Remove the wheel from the wheelpant and reinstall on the axle.
3. Slide the wheel collar onto the axle with the shoulder (offset) side towards the wheel. Tighten the set screw on the wheel collar.

TIP: reinstall the wheelpant retaining collar and screws to prevent losing parts in case you wish to reinstall them.

TIP: use blue threadlocker on the wheel collar set screw for added security.



AIRCRAFT TROUBLESHOOTING GUIDE

Should you encounter any abnormal situations with your QQ Extra 300, refer to the matrix below to determine probable cause and a recommended solution for the action.

If the required solution does not rectify the problem, please contact product support for further assistance.

Refer to the product web page and www.flexinnovations.com/aura for the latest information and downloads.

NOTICE

Unless specifically required, ALWAYS troubleshoot the airplane with the propeller removed.

DISCREPANCY	PROBABLE CAUSE	RECOMMENDED SOLUTION
Motor nonresponsive (ESC initialization tones audible)	Throttle not at idle and/or throttle trim too high	Lower throttle stick and trim completely. If problem persists, ensure that the sub-trim and travel adjust are properly set in the radio's programming.
	Throttle channel is reversed	Reverse throttle channel in radio programming
Motor nonresponsive (no ESC initialization tones audible)	Motor disconnected from ESC	Ensure plugs are fully seated. Check battery and/or plugs for damage and replace any damaged components found - DO NOT ATTEMPT REPAIR
Motor turns in the wrong direction	The three motor wires are connected incorrectly to the ESC	Swap any TWO motor wires.
Reduced flight time or aircraft underpowered	Flight battery not fully charged	Ensure battery is fully charged prior to installing in aircraft
	Propeller installed backwards	Install propeller so that the convex side faces forward (tractor configuration)
	Flight battery damaged	Remove battery from service completely and replace with a different battery
	Ambient temperature is too cold	Ensure battery packs are adequately warm (70°F/21°C) before flight
	Battery capacity too small for intended use	Replace battery with one of proper capacity and discharge capacity (C rating)
	ESC reaching preset LVC (low-voltage cutoff)	Recharge flight battery or reduce flight time
	Battery is too weak or damaged	Check battery's physical condition, check battery voltages after charge
	Battery's discharge rating may be too small	Replace battery with one with higher 'C' rating
Excessive propeller noise and/or vibration	Damaged spinner and/or propeller, collet, or motor	Replace damaged components - DO NOT ATTEMPT REPAIR
	Propeller is not balanced	Balance or replace the propeller
	Prop nut is loose	Tighten prop nut with appropriate-sized wrench
	Spinner is not fully in place or tightened	Loosen the spinner bolt, adjust as required, retighten spinner bolt
Control surfaces nonresponsive	Airframe or control linkage system damage	Examine airframe for damage, repair as required; inspect control linkage system (servo, pushrod, control horn) for damaged components and replace as required
	Wire damaged or connector loose	Examine wires and connections, replace as necessary
	Transmitter bound incorrectly, incorrect active model memory, incorrect Aura data input configuration, incorrect Aura transmitter settings	Consult radio manual for proper binding and model selection instructions
	Battery voltage too low	Use volt meter to check battery; recharge or replace as necessary
	Battery disconnected from ESC	Check that the EC3 plugs are fully seated
	BEC (battery elimination circuit) damaged	Replace ESC- DO NOT ATTEMPT REPAIR
Failed control direction test	Incorrect Aura 8 setting- DO NOT FLY!	Refer to Aura 8 manual/website to correct the direction of gain correction
Controls reversed	Aura 8 or transmitter settings incorrect	Refer to control surface direction chart and adjust appropriate settings as required
Control surface oscillation	Exceeding maximum airspeed for configuration	Reduce airspeed
	Gains too high for aircraft/flight configuration	Refer to Aura 8 manual to decrease desired control surface gain
	Propeller/spinner not balanced	Balance or replace propeller and/or spinner
	Motor vibration	Inspect motor mounting bolts and re-tighten as necessary
	Loose Aura 8 mounting	Re-align and secure the Aura 8 to the aircraft
	Control linkage slop	Examine control system and repair or replace work components
	Improper transmitter setup	Refer to Aura 8 manual to correctly configure transmitter
	Damaged propeller or spinner	Replace damaged component- DO NOT ATTEMPT REPAIR
Trim changes between flight modes	Trims are not properly zeroed	Readjust control linkage and re-center trims in radio
	Sub-trim is not properly zeroed	Remove sub-trim; adjust the servo arm or clevis to achieve proper geometry

LIMITED WARRANTY

Warranty Coverage

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

Outside of Coverage

This warranty is not transferable and does not cover:

- (a) Products with more than 45 days after purchased date.
- (b) Damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance
- (c) Modification of or to any part of the Product.
- (d) Product not compliant with applicable technical regulations.
- (e) Shipping damage.
- (f) Cosmetic damage

OTHER THAN THE EXPRESS WARRANTY ABOVE, FLEX MAKES NO OTHER WARRANTY OR REPRESENTATION, AND HEREBY DISCLAIMS ANY AND 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 Solution

Flex's sole obligation and purchaser's sole and exclusive remedy shall be that Flex will, at its option, either (i) service, or (ii) replace, any Product determined by Flex to be defective. Flex reserves the right to inspect any and 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 PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY 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 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 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 PRIOR NOTICE.**

Questions & Assistance

Visit <http://www.flexinnovations.com/flex-authorized-reseller> for customer support in your region.

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 a shipping carton. Please note that original boxes needs to be included, but are not designed to withstand the rigors of shipping without additional protection. 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 warranty conditions have been met, your Product will be replaced free of charge. Shipping charges are as follow: to Flex by customer, Flex out it is by Flex. Service or replacement decisions are at the sole discretion of Flex.

COMPLIANCE INFORMATION FOR THE EUROPEAN UNION

 **Declaration of Conformity** (In accordance with ISO/IEC 17050-1)

Product(s): QQ Extra 300 Super PNP
Item Number(s): FPR3070A/FPR3070B

The object of declaration described above is in conformity with the requirements of the specifications listed below, following the provisions of the EMC Directive 2004/108/EC.

EN 55022: 2010+AC: 2011

EN 55024: 2010

EN 61000-3-2: 2006+A2:2009

EN 61000-3-3: 2013

EN 61000-6-3: 2007/A1:2011

EN 61000-6-1: 2007



Instructions for disposal of WEEE by users in the European Union

This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collections point for the recycling of waste and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where to drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.



Academy of Model Aeronautics National Model Aircraft Safety Code

Effective January 1, 2014

A. **GENERAL:** A model aircraft is a non-human-carrying aircraft capable of sustained flight in the atmosphere. It may not exceed limitations of this code and is intended exclusively for sport, recreation, education and/or competition. All model flights must be conducted in accordance with this safety code and any additional rules specific to the flying site.

1. Model aircraft will not be flown:
 - (a) In a careless or reckless manner.
 - (b) At a location where model aircraft activities are prohibited.
2. Model aircraft pilots will:
 - (a) Yield the right of way to all human-carrying aircraft.
 - (b) See and avoid all aircraft and a spotter must be used when appropriate. (AMA Document #540-D.)
 - (c) Not fly higher than approximately 400 feet above ground level within three (3) miles of an airport without notifying the airport operator.
 - (d) Not interfere with operations and traffic patterns at any airport, heliport or seaplane base except where there is a mixed use agreement.
 - (e) Not exceed a takeoff weight, including fuel, of 55 pounds unless in compliance with the AMA Large Model Airplane program. (AMA Document 520-A.)
 - (f) Ensure the aircraft is identified with the name and address or AMA number of the owner on the inside or affixed to the outside of the model aircraft. (This does not apply to model aircraft flown indoors.)
 - (g) Not operate aircraft with metal-blade propellers or with gaseous boosts except for helicopters operated under the provisions of AMA Document #555.
 - (h) Not operate model aircraft while under the influence of alcohol or while using any drug that could adversely affect the pilot's ability to safely control the model.
 - (i) Not operate model aircraft carrying pyrotechnic devices that explode or burn, or any device which propels a projectile or drops any object that creates hazard to persons or property.

Exceptions:

- Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight.
 - Rocket motors (using solid propellant) up to a G-series size may be used provided they remain attached to the model during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code but may not be launched from model aircraft.
 - Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined within the Team AMA Program Document. (AMA Document #718.)
 - (j) Not operate a turbine-powered aircraft, unless in compliance with the AMA turbine regulations. (AMA Document #510-A.)
3. Model aircraft will not be flown in AMA sanctioned events, air shows or model demonstrations unless:
 - (a) The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipated prior to the specific event.
 - (b) An inexperienced pilot is assisted by an experienced pilot.
 4. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.

B. RADIO CONTROL (RC)

1. All pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others.
2. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.
3. At all flying sites a safety line(s) must be established in front of which all flying takes place. (AMA Document #706.)
 - (a) Only personnel associated with flying the model aircraft are allowed at or in front of the safety line.
 - (b) At air shows or demonstrations, a straight safety line must be established.
 - (c) An area away from the safety line must be maintained for spectators.
 - (d) Intentional flying behind the safety line is prohibited.

4. RC model aircraft must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
5. RC model aircraft will not knowingly operate within three (3) miles of any pre-existing flying site without a frequency-management agreement. (AMA Documents #922 and #923.)
6. With the exception of events flown under official AMA Competition Regulations, excluding takeoff and landing, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and the pilot's helper(s) located at the flightline.
7. Under no circumstances may a pilot or other person touch an outdoor model aircraft in flight while it is still under power, except to divert it from striking an individual.
8. RC night flying requires a lighting system providing the pilot with a clear view of the model's attitude and orientation at all times. Hand-held illumination systems are inadequate for night flying operations.
9. The pilot of an RC model aircraft shall:
 - (a) Maintain control during the entire flight, maintaining visual contact without enhancement other than by corrective lenses prescribed for the pilot.
 - (b) Fly using the assistance of a camera or First-Person View (FPV) only in accordance with the procedures outlined in AMA Document #550.
 - (c) Fly using the assistance of autopilot or stabilization system only in accordance with the procedures outlined in AMA Document #560.

C. FREE FLIGHT

1. Must be at least 100 feet downwind of spectators and automobile parking when the model aircraft is launched.
2. Launch area must be clear of all individuals except mechanics, officials, and other fliers.
3. An effective device will be used to extinguish any fuse on the model aircraft after the fuse has completed its function.

D. CONTROL LINE

1. The complete control system (including the safety thong where applicable) must have an inspection and pull test prior to flying.
2. The pull test will be in accordance with the current Competition Regulations for the applicable model aircraft category.
3. Model aircraft not fitting a specific category shall use those pull-test requirements as indicated for Control Line Precision Aerobatics.
4. The flying area must be clear of all utility wires or poles and a model aircraft will not be flown closer than 50 feet to any above-ground electric utility lines.
5. The flying area must be clear of all nonessential participants and spectators before the engine is started.

If you are not an AMA member, please consider joining. Founded in 1936 and open to anyone interested in model aviation, the AMA is the governing body for model aviation in the United States and sanctions over 2,000 competitions annually. Membership in the AMA provides liability insurance coverage, protects modelers' rights and interests, and is required to fly at most of the 2,700+ R/C sites nationwide.

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