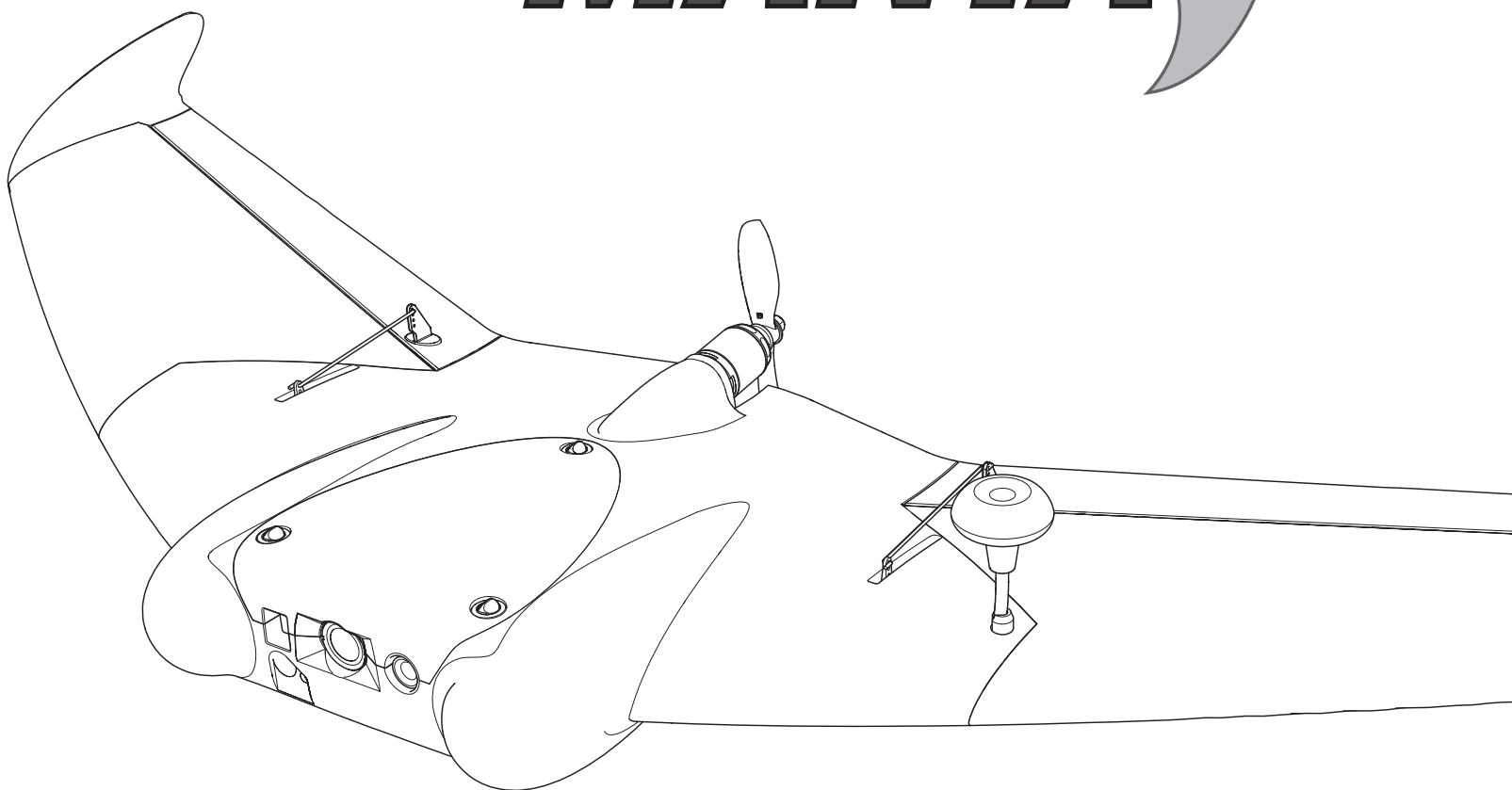


**BLADE**<sup>®</sup>  
*ImmersionRC*  
REAL VIRTUALITY

# MANTA



Instruction Manual  
Bedienungsanleitung  
Manuel d'utilisation  
Manuale di Istruzioni

**BNF**<sup>™</sup>  
BASIC

## NOTICE

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, LLC. For up-to-date product literature, visit [horizonhobby.com](http://horizonhobby.com) and click on the support tab for this product.


## Meaning of Special Language

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 superficial injury.

 **WARNING:** Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

This is a sophisticated hobby product. It must be operated with caution and common sense and 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. This product is not intended for use by children without direct adult supervision. Do not use with incompatible components or alter this product in any way outside of the instructions provided by Horizon Hobby, LLC. 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.

**Age Recommendation: Not for children under 14 years. This is not a toy.**

## Safety Precautions and Warnings

- Always keep a safe distance in all directions around your model to avoid collisions or injury. This model is controlled by a radio signal subject to interference from many sources outside your control. Interference can cause momentary loss of control.
- Always operate your model in open spaces away from full-size vehicles, traffic and people.
- Always carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.).
- Always keep all chemicals, small parts and anything electrical out of the reach of children.
- Always avoid water exposure to all equipment not specifically designed and protected for this purpose. Moisture causes damage to electronics.
- Never place any portion of the model in your mouth as it could cause serious injury or even death.
- Never operate your model with low transmitter batteries.
- Always keep aircraft in sight and under control.
- Always move the throttle fully down at rotor strike.
- Always use fully charged batteries.
- Always keep transmitter powered on while aircraft is powered.
- Always remove batteries before disassembly.
- Always keep moving parts clean.
- Always keep parts dry.
- Always let parts cool after use before touching.
- Always remove batteries after use.
- Never operate aircraft with damaged wiring.
- Never touch moving parts.

 **WARNING AGAINST COUNTERFEIT PRODUCTS:** If you ever need to replace a Spektrum component found in a Horizon Hobby product, always purchase from Horizon Hobby, LLC or a Horizon Hobby authorized dealer to ensure authentic high-quality Spektrum product. Horizon Hobby, LLC disclaims all support and warranty with regards, but not limited to, compatibility and performance of counterfeit products or products claiming compatibility with DSM or Spektrum technology.

**If you are operating this product in North America, you are required to have an Amateur Radio (HAM) license. Visit [www.arrl.org](http://www.arrl.org) for more information.**

**As of this printing, you are required to register with the FAA if you own this product.**

For up-to-date information on how to register with the FAA, please visit <https://registermyuas.faa.gov/>.

For additional assistance on regulations and guidance on UAS usage, visit [knowbeforeyoufly.org/](http://knowbeforeyoufly.org/).

# BLADE® MANTA

ImmersiOn RC REAL VIRTUALITY

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## Specifications

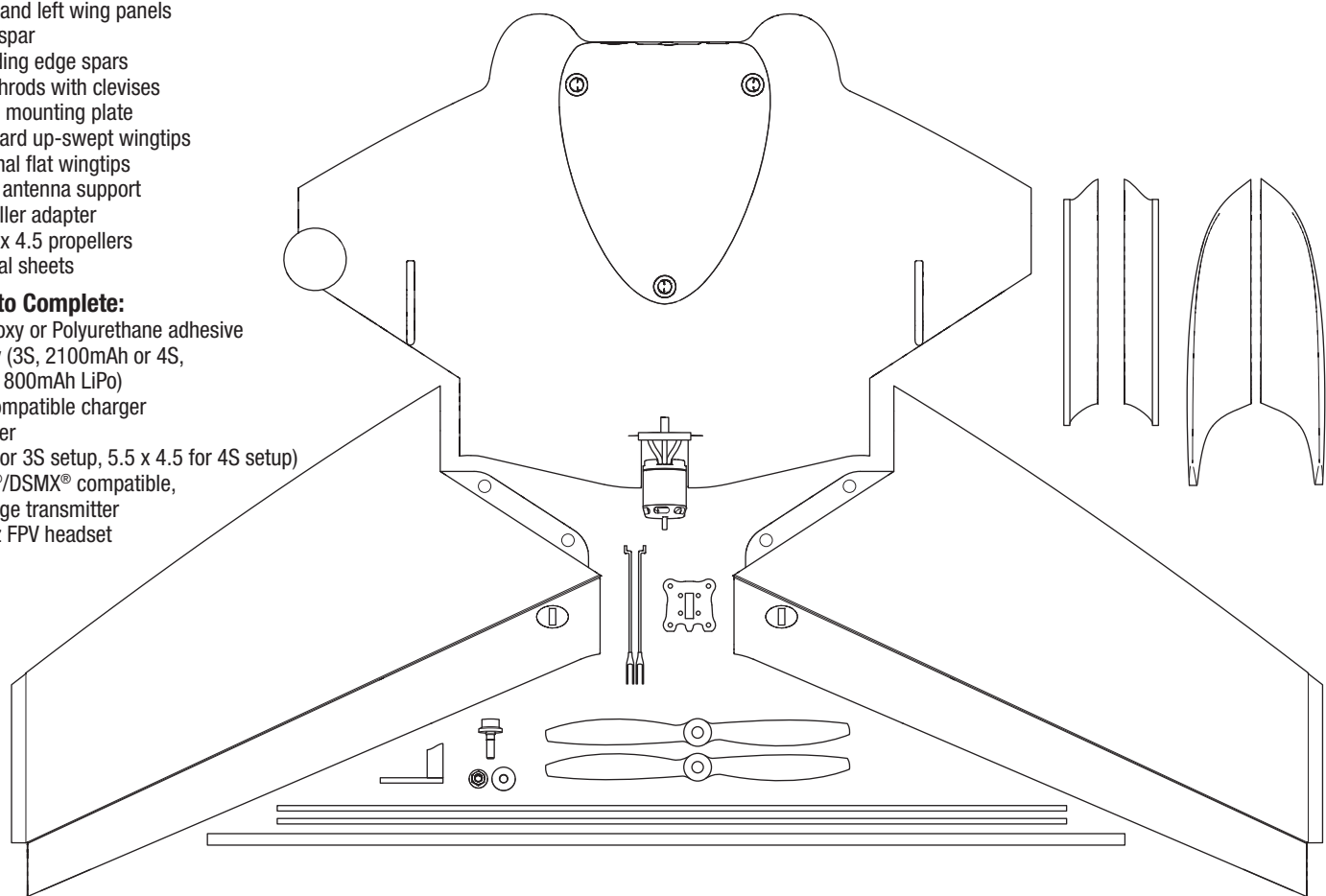
<b>Wingspan</b>	43 in (670mm)
<b>Length</b>	19.5 in (215mm)
<b>Flying Weight</b>	25.4 oz (850 g)

### Box Contents:

- Manta FPV Wing
  - Center section with electronic components installed
  - Right and left wing panels
  - Main spar
  - 2 leading edge spars
  - 2 pushrods with clevises
  - Motor mounting plate
  - Standard up-swept wingtips
  - Optional flat wingtips
  - Video antenna support
  - Propeller adapter
  - 2 5.5 x 4.5 propellers
  - 3 decal sheets

### Needed to Complete:

- CA, Epoxy or Polyurethane adhesive
- Battery (3S, 2100mAh or 4S, 1300-1800mAh LiPo)
- LiPo compatible charger
- Propeller (6 x 4 for 3S setup, 5.5 x 4.5 for 4S setup)
- DSM2®/DSMX® compatible, full range transmitter
- 5.8GHz FPV headset



To receive product updates, special offers and more, register your product at [www.bladehelis.com](http://www.bladehelis.com).

## First Flight Preparation

- Remove and inspect contents
- Begin charging the flight battery
- Assemble the aircraft
- Program your computer transmitter
- Install the flight battery in the aircraft (once it has been fully charged)
- Bind your transmitter
- Familiarize yourself with the controls
- Find a suitable area for flying

## Assembly

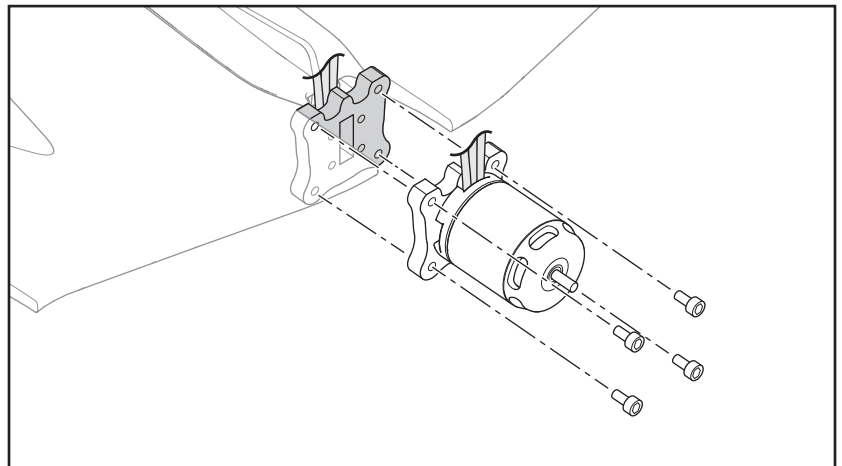
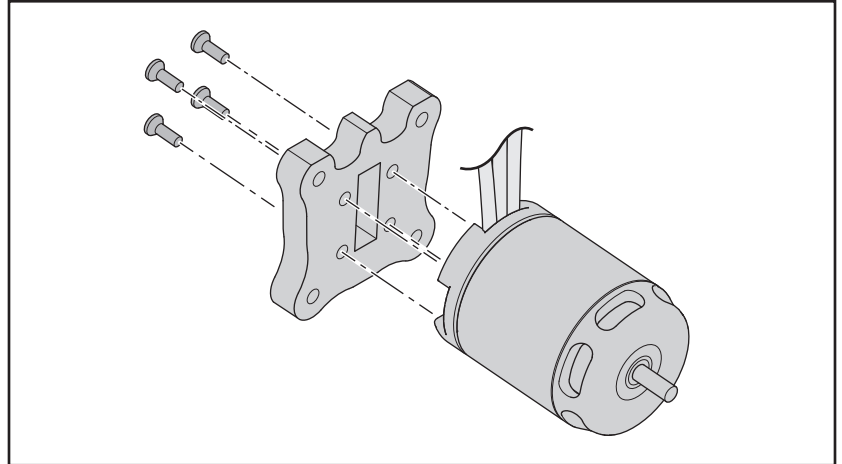
Prior to beginning assembly, inspect all of the foam parts. Using a hobby knife or sandpaper, remove any excess flash or rough edges.

**NOTICE:** When using cyanoacrylate (CA) adhesive to join or repair the airframe, **DO NOT** allow the adhesive to contact or get close to the fpv camera lens. The vapors from the adhesive will permanently fog the camera lens.

### Install the Motor

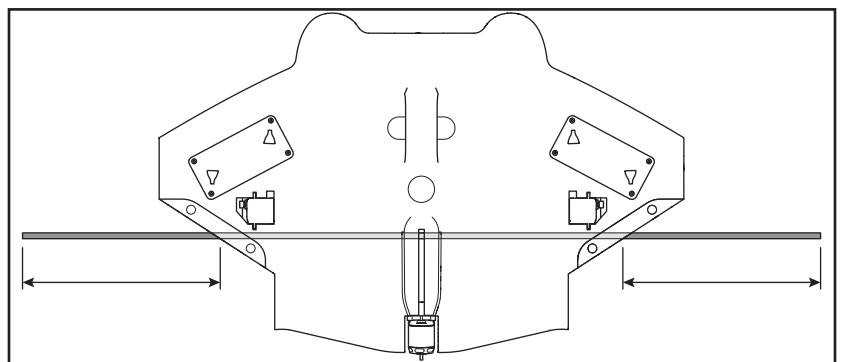
**NOTICE:** The Manta FPV Wing is shipped with the ESC installed and the motor soldered directly to the circuit board. Care must be taken to not damage the motor wires or the ESC circuit board while handling or installing the motor to the airframe.

1. Attach the motor mounting plate to the motor using 2.5mm flathead screws and threadlock, with the motor wires oriented as shown in the illustration.
2. Carefully move the motor into position against the motor mount.
3. Attach the motor mounting plate to the motor mount as shown, using 2.5mm screws and threadlock.



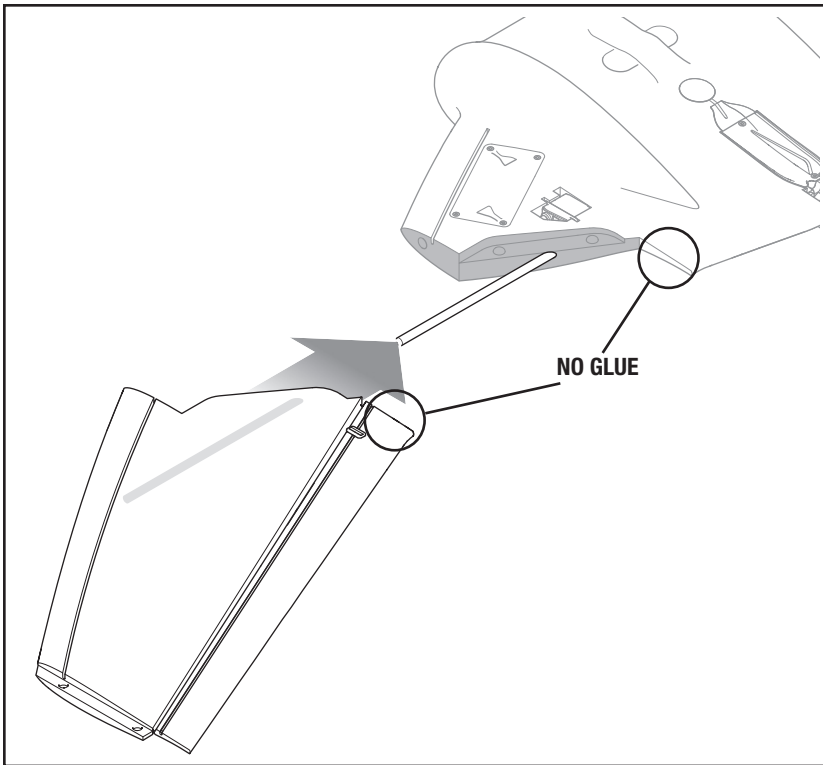
### Install the Main Spar

Slide the carbon main spar through the hole in the center wing section until both ends of the spar extend an equal amount. The spar will fit tightly in the center section. Work slowly and carefully to avoid damaging the foam material.



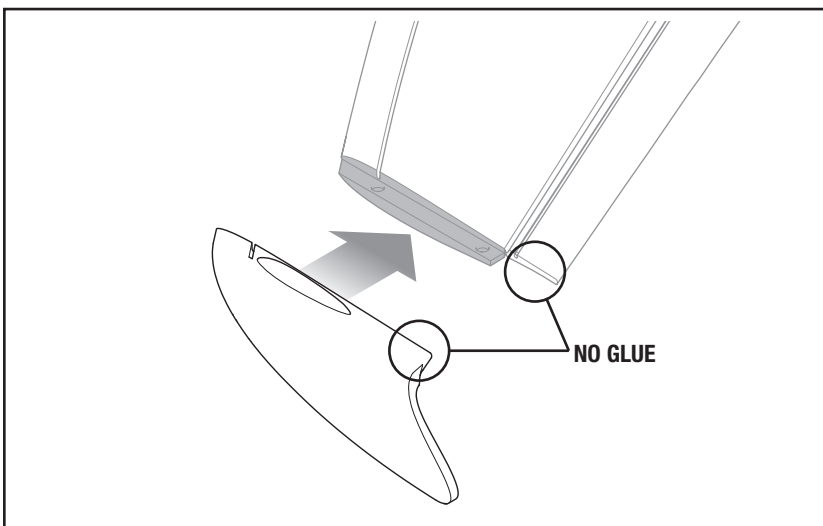
## Flying Checklist

- Always turn the transmitter on first
- Plug the flight battery into the lead from the ESC
- Allow the ESC to initialize and arm properly
- Fly the model
- Land the model
- Unplug the flight battery from the ESC
- Always turn the transmitter off last



### Install the Wings

1. Apply glue to the mating surfaces of the wing panel and center section. **DO NOT** apply glue to the end of the elevon or to the center section where the elevon meets it.
2. Carefully slide the wing panel fully onto the main spar until the wing panel and center section line up.
3. Use masking tape to hold the wing and center section together until the glue fully cures.
4. Repeat steps 1-3 for the other wing panel.

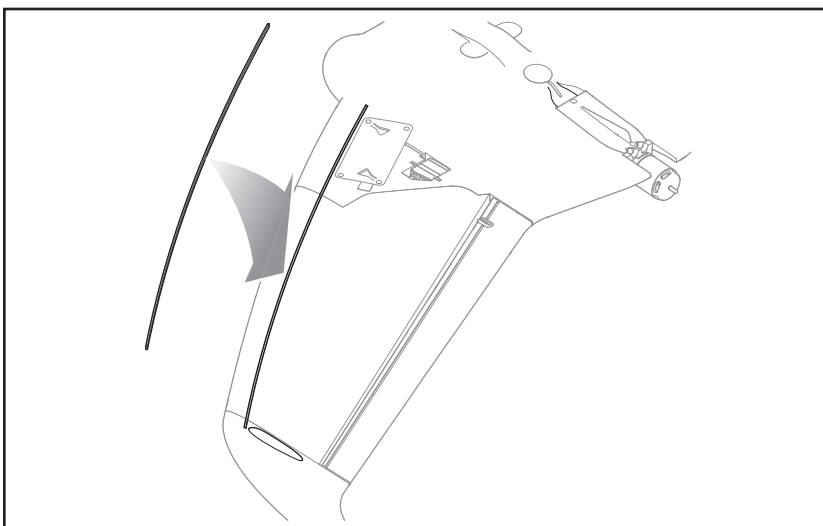


### Install the Wingtips

The Manta FPV Wing includes two styles of wingtips. The standard, upswept wingtip is shown in the illustrations. The flat wingtips are provided so the pilot can custom design his or her own vertical tip plates.

**NOTICE:** Attempting to fly the Manta without either the standard wingtip or flat wingtip with vertical tip plates installed will make the aircraft unstable and may cause a crash. **Crash damage is not covered under warranty.**

1. Glue the wingtip to the wing panel.  
**DO NOT** apply glue to the end of the elevon or to the wingtip where the elevon meets it.
2. Use masking tape to hold the wingtip to the wing panel until the glue fully cures.
3. Repeat steps 1-2 for the other wing panel.

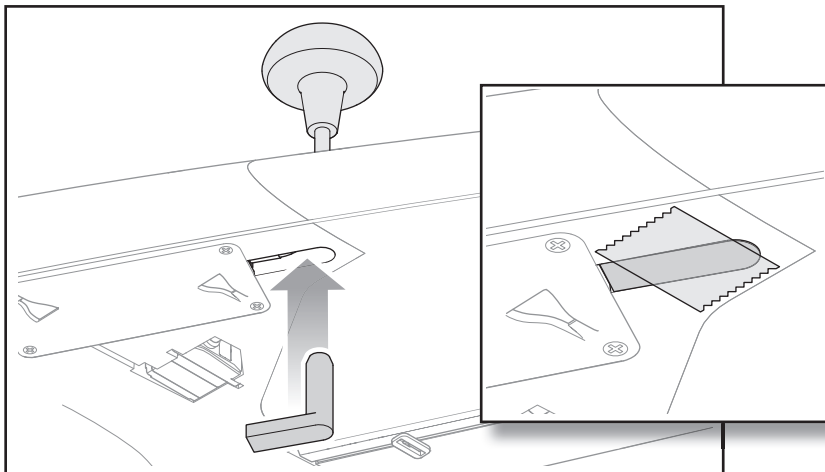


### Install the Leading Edge Spar

1. Glue the leading edge spar into the slot as shown. Be sure to insert the spar fully into the slot. Bend the spar slightly as it is inserted to follow the curve of the slot. The spar should extend from the wingtip through the wing panel and into the center section.
2. Allow the glue to cure fully.
3. Repeat for the other wing panel.

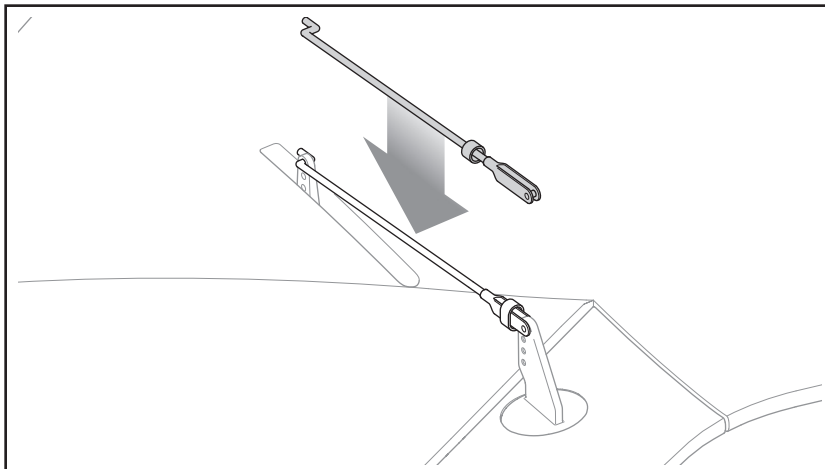
### Install the Video Antenna Support

1. Ensure the video transmitter antenna connection is tight. If the antenna has loosened during shipping, remove the video transmitter cover and tighten the antenna.
2. Carefully flex the antenna cable until it is upright, perpendicular to the upper surface of the wing.
3. Slide the antenna support through the bottom of the wing around the antenna cable as shown.
4. Apply a piece of tape over the support to secure it in place.



### Install the Control Rods

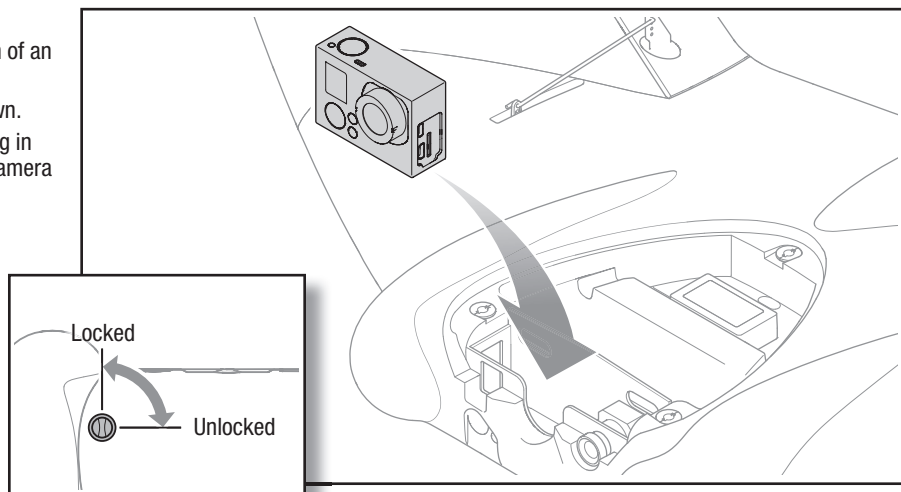
1. Install the control rods as shown. The control rods should be placed in the outermost holes in both the elevon control horns and servo arms.
2. Place a small piece of silicone tubing over the clevis to keep the clevis from opening in flight.
3. Repeat steps 1-2 for the other wing panel.



### Install the Optional Camera

The center section of the wing has space provided for the addition of an optional video camera.

1. Remove the center section cover by turning the latches as shown.
2. Insert your camera as shown, lining the lens up with the opening in the wing. Soft foam can be used if necessary to help hold the camera in place and dampen vibration.
3. Replace the center section cover.



## Transmitter Setup

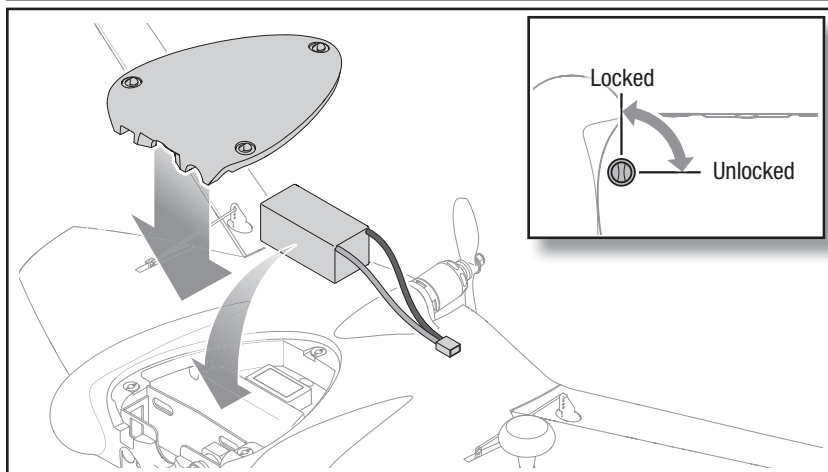
DX6, DX7 (Gen 2), DX8 (Gen 2), DX9, DX18, DX20

SETUP LIST		FUNCTION LIST					
Model Type		Servo Setup					
Airplane		Chan	Travel	Reverse	Chan	Travel	Reverse
F-Mode Setup		THR	100/100	Normal	RUD	100/100	Normal
Switch 1	Inhibit	AIL	100/100	Normal	GER	100/100	Normal
Switch 2	Inhibit	ELE	100/100	Normal	AUX1	100/100	Normal
Channel Assign		D/R & Expo				Timer	
Channel Input Config		Chan	Switch (B) Pos	D/R	Expo	Mode	Count Down
1 Throttle		AILE	0	100/100	0	Time	5:00
2 Aileron			1	100/100	0	Start	Throttle Out
3 Elevator			2	100/100	0	Over	25%
4 Rudder		ELEV	0	100/100	0	One Time	Inhibit
5 Gear	Switch B		1	100/100	0		
6 Aux 1			2	100/100	0		
Frame Rate							
22ms							
DSMX							

## Program Your Transmitter

1. Set the model type to "Airplane."
  2. Assign channel 5 (Gear) to a 3-position switch. In the table at left, switch **B** is used.
  3. Leave all other settings at the default values.
- Switch **B** will now control the flight mode function.
- If, after flying the aircraft, more or less exponential or dual rate values are desired, those may be adjusted up or down to suit your flying style.

## Flight Battery Installation and ESC Arming

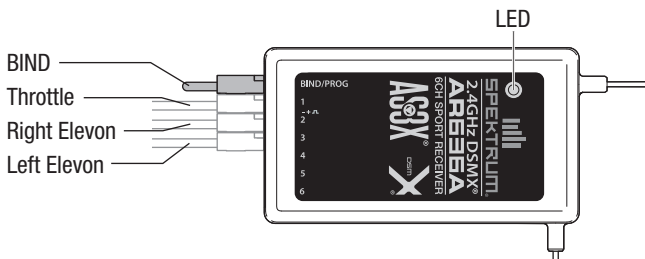


1. Remove the center section cover by turning the latches as shown.
2. Insert the flight battery as shown. The use of hook and loop tape is recommended to secure the battery in the compartment.
3. Connect the battery connector to the ESC power lead, noting correct polarity. The ESC is now armed.
4. Keep the aircraft out of the wind and immobile for approximately 5 seconds, until the receiver initializes. The ESC will emit a series of tones and the LED on the receiver will light. If the receiver LED flashes rapidly, proceed to the Transmitter and Receiver Binding section.
5. Replace the center section cover.

## Transmitter and Receiver Binding

**NOTICE:** Do not install the propeller and propeller adapter to the motor shaft prior to binding to prevent injury or damage due to unexpected motor startup during binding.

Binding is the process of programming the receiver to recognize the GUID (Globally Unique Identifier) code of a single specific transmitter. You need to 'bind' your chosen Spektrum™ DSM2®/DSMX® technology equipped aircraft transmitter to the receiver for proper operation.



If you encounter problems, obey binding instructions and refer to your transmitter troubleshooting guide for other instructions. If needed, contact the appropriate Horizon Product Support office.

### Binding Procedure

1. Insert the bind plug in the BIND port on the receiver.
2. Connect the battery connector to the ESC power lead. The orange LED on the receiver flashes rapidly, indicating the receiver is in bind mode.
3. Lower the throttle stick to the lowest position. Set all trims to the center position.
4. Follow the procedures of your specific transmitter to enter Bind Mode. The system will connect within a few seconds. Binding is complete when the orange LED on the receiver glows solid.
5. Remove the bind plug from the BIND/PROG port, and store it in a convenient place.
6. Disconnect the battery from the ESC power lead.
7. Power off the transmitter.



**WARNING:** You must move the throttle to the LOW/OFF position prior to binding. Failure to do so may cause the motor to start unexpectedly during binding, which could result in damage to property and injury.

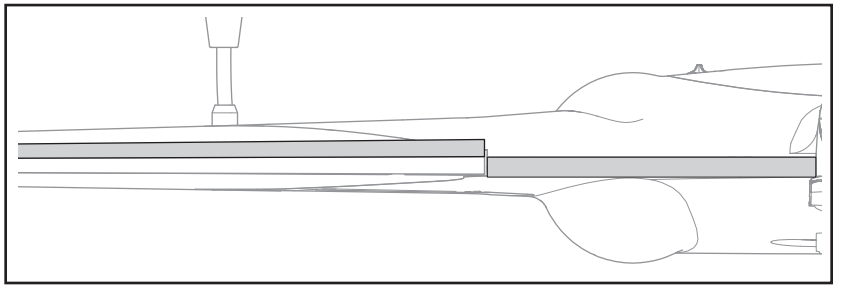
**NOTICE:** Remove the bind plug to prevent the system from entering bind mode the next time the power is turned on.

## Control Surface Centering

**NOTICE:** Remove the propeller and propeller adapter from the motor shaft during control surface adjustments. Any movement of the throttle (even accidental) will cause the propeller to spin.

With the receiver powered on, center the controls and trims. When the controls are neutral, the elevons should have a slight upward deflection. The **bottom** of the trailing edge of the elevon should align with the **top** of the trailing edge of the center section, as shown in the illustration. Disconnect the clevis from the control horn and adjust the clevis on the control rod mechanically until the deflection of the elevon is correct.

When the elevon neutral position is correct, power off the receiver.



## AS3X® Control Direction Test

This test ensures that the AS3X control system is functioning properly. Assemble the aircraft and make sure your transmitter is properly bound to the receiver before performing this test.

1. Firmly grip the airframe, keeping hands and loose clothing away from the propeller.
2. Advance the throttle to just above 25% and then lower the throttle to activate the AS3X system.
3. Move the entire aircraft as shown, paying attention to the elevons as you move it. The elevons should move in the directions indicated in the illustration. If they do not respond as shown, **DO NOT fly the aircraft**. Refer to the receiver manual for information on how to reverse the elevon channels.

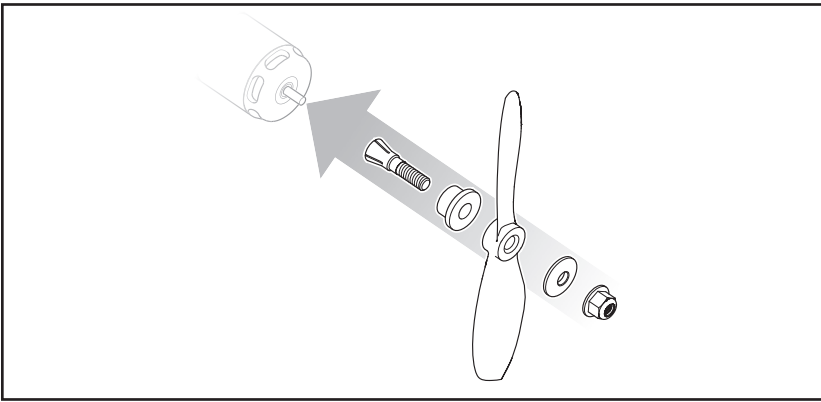
Once the AS3X system is activated, the control surfaces may move rapidly. This is normal. The AS3X system is active until the battery is disconnected.

After completing the control direction test, power off the receiver.

Aircraft Movement	Elevon Reaction



## Install the Propeller

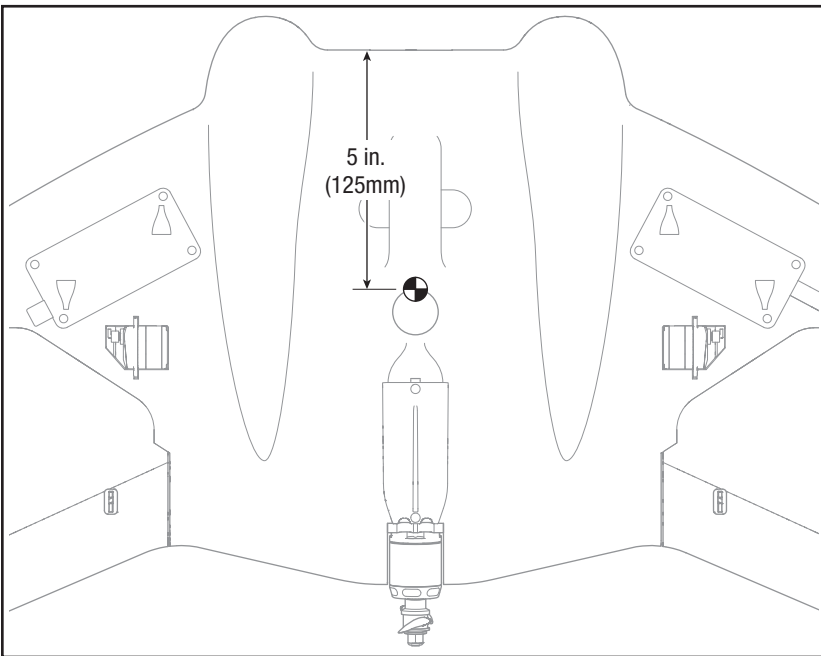


If you are using a 4S battery, a 5.5" x 4.5" propeller is recommended. If you are using a 3S battery, a 6" x 4" propeller is recommended.

Install the propeller adapter, propeller, washer and nut on the motor shaft as shown. The front of the propeller should face toward the motor and the front of the aircraft. Placing the propeller on backwards will cause a dramatic decrease in performance.

**Do not** overtighten the nut as damage to the propeller or propeller adapter may result.

## Balance the Airframe



**NOTICE: DO NOT omit this step.** Failure to balance the airframe properly will make the aircraft uncontrollable and will cause a crash. Crash damage is not covered under warranty.

1. The center of gravity is located 5 in (125mm) from the leading edge of the center section at the front edge of the center throwing hole as shown. Add weight to either the front or rear of the center section until proper balance is achieved. If you elected to not install an optional video camera, you will need to add weight to the front compartment to achieve proper balance.
2. Check the lateral balance. If necessary, add weight to the light wingtip in very small increments.

## Flight Modes Explained

The Manta FPV Wing has three flight modes pre-programmed into the receiver:

### Launch Mode (switch position 0)

In Launch Mode the aircraft will self level and has bank and pitch limiting. At full throttle, the aircraft will have a gradual climbing attitude. Pull back on the elevator stick if a faster rate of climb is needed or desired.

Launch mode can also be used as an attitude recovery mode. If the aircraft is in an unknown or unexpected attitude while in Intermediate or Experienced mode, change to Launch mode and release the sticks to return the aircraft to upright and level flight.

**NOTICE:** The aircraft must have sufficient altitude and enough distance away from any obstacles to return to upright level flight.

### Intermediate Mode (switch position 1)

In Intermediate Mode the aircraft has bank and pitch limiting to help prevent the pilot from over-controlling. The aircraft dampens any outside forces to give a smooth flight performance, even in moderate wind and turbulence. This mode does not have self leveling. Use this mode to help get the feel of the aircraft before moving on to more advanced aerobatic flight.

### Experienced Mode (switch position 2)

Experienced Mode has no bank or pitch limiting, giving an unlimited flight envelope. The aircraft dampens any outside forces to give a smooth flight performance, even in moderate wind and turbulence.

## Flying the Manta

Consult local laws and ordinances before choosing a flying location.

### Range Check your Radio System

Before you fly, range check the radio system. Refer to your specific transmitter instruction manual for range test information.

### Oscillation

Once the AS3X system is active (after advancing the throttle for the first time), you will normally see the control surfaces react to aircraft movement. In some flight conditions you may see oscillation (the aircraft rocks back and forth on one axis due to overcontrol). If oscillation occurs, refer to the Troubleshooting Guide for more information.

### Flying

We recommend flying the Manta using line of sight for the first few flights, until you are familiar with characteristics of the aircraft. Once you are comfortable, you may proceed to flying the aircraft using FPV.

Always choose a wide-open space for flying. Due to the higher speeds of this aircraft, it does require more room to fly than average foam models. It is ideal for you to fly at a sanctioned flying field. If you are not flying at an approved site, always avoid flying near houses, trees, wires and buildings. You should also be careful to avoid flying in areas where there are many people, such as busy parks, schoolyards, or soccer fields.

### Hand Launching

For the first few flights, we recommend you use the help of a friend to hand launch the model. Hold the aircraft with the finger grips on the underside of the center section. Set the flight mode to Launch Mode. With the throttle off, give the aircraft a firm throw directly into the wind at a slight upward angle (10 degrees above the horizon). As you let go of the aircraft, advance the throttle and climb out.



**CAUTION: DO NOT** advance the throttle before tossing the aircraft. Serious injury may result from the spinning propeller hitting your throwing hand or arm. Always **FIRST** toss the aircraft, and **THEN** advance the throttle.

### In flight trimming

During your first flight, while flying in either Intermediate or Experienced Mode, trim the aircraft for level flight at 3/4 throttle. Make small trim adjustments with your transmitter trim switches to straighten the aircraft's flight path.

**NOTICE: DO NOT** attempt to trim the aircraft in Launch Mode.

After landing, adjust the linkages mechanically to account for trim changes and then reset the trims to neutral. Ensure the aircraft will fly straight and level with no trim or sub-trim.

### Landing

For your first flights with the recommended battery pack, set your transmitter timer to 3 minutes. After three minutes, land the aircraft. Adjust your timer for longer or shorter flights once you have flown the model. If at any time the motor pulses, land the aircraft immediately to recharge the flight battery. See the Low Voltage Cutoff (LVC) section for more details on maximizing battery health and run time.

Land the aircraft into the wind in a soft area, such as tall grass. Use a small amount of throttle for the initial approach. Once the aircraft is on a proper approach angle, and the aircraft will land in the proper area, remove all throttle, but maintain the descent. During approach and landing, keep the wings level and the aircraft pointed into the wind. As you approach 2-3 feet in altitude, begin your flare. Continue easing back on the elevator to bring the aircraft down gently on the belly.

**NOTICE:** If a crash is imminent, reduce the throttle and trim fully. Failure to do so could result in extra damage to the airframe, as well as damage to the ESC and motor.

**NOTICE:** After any impact, always ensure the receiver is secure in the fuselage. If you replace the receiver, install the new receiver in the same orientation as the original receiver or damage may result.

**NOTICE:** Crash damage is not covered under warranty.

**NOTICE:** When you are finished flying, never leave the aircraft in direct sunlight or in a hot, enclosed area such as a car. Doing so can damage the aircraft.

### Low Voltage Cutoff (LVC)

When a Li-Po battery is discharged below 3V per cell, it will not hold a charge. The ESC protects the flight battery from over-discharge using Low Voltage Cutoff (LVC). Before the battery charge decreases too much, LVC removes power supplied to the motor. Power to the motor pulses, showing that some battery power is reserved for flight control and safe landing.

Disconnect and remove the Li-Po battery from the aircraft after use to prevent trickle discharge. Charge your Li-Po battery to about half capacity before storage. During storage, make sure the battery charge does not fall below 3V per cell. LVC does not prevent the battery from over-discharge during storage.

**NOTICE:** Repeated flying to LVC will damage the battery.

### Repairs

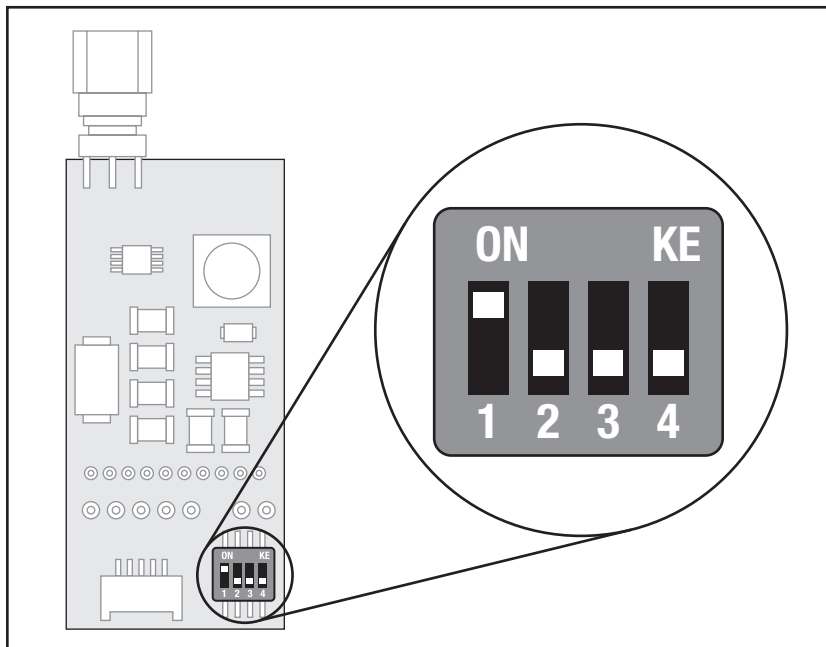
Repairs to the foam can be made using virtually any adhesive (hot glue, CA, epoxy, etc). When parts are not repairable, see the Parts List for ordering a replacement airframe. For a listing of all replacement components and optional parts, refer to the list at the end of this manual.

**NOTICE:** When using cyanoacrylate (CA) adhesive to join or repair the airframe, **DO NOT** allow the adhesive to contact or get close to the fpv camera lens. The vapors from the adhesive will permanently fog the camera lens.

## Post-Flight Inspection

<b>Cleaning</b>	Make sure the battery is not connected before cleaning. Remove dust and debris with a soft brush or a dry lint free cloth.
<b>Airframe</b>	Check the airframe for any cracks or other damage. Minor repairs to the foam can be made using CA or epoxy. Badly damaged parts should be replaced.
<b>Control Linkages</b>	Make sure the control horns are secure. Make sure the control rods are secure in the control horns. Make sure the clevises are tight and the silicone retainers are in place.
<b>Wiring</b>	Make sure wiring does not contact moving parts. Replace damaged wiring and loose connectors.
<b>Fasteners</b>	Make sure there are no loose screws, other fasteners or connectors. Do not over tighten metal screws in plastic parts. Tighten screw so parts are mated together, then turn screw only 1/8th of a turn more.
<b>Propeller</b>	Make sure there is no damage to the propeller blades. Damage includes cracks, burrs, chips or scratches. Replace damaged parts before the next flight.
<b>Receiver</b>	Make sure the AR636 receiver is securely attached to the frame. Replace the double-sided tape when necessary. The aircraft will crash if the receiver separates from the frame.

## Changing Video Transmitter Frequency



**NOTICE:** Do not remove the clear plastic shrink wrap from around the video transmitter. Removal may result in damage to the components attached to the board.

The supplied video transmitter is capable of transmitting on various frequencies within the 5.8GHz band. Changing between frequencies is accomplished by changing 3 of the 4 dip switches on the transmitter board. The 4th switch is not used, so its position is irrelevant.

Follow the table below to select the desired video frequency.

Switch Number				Frequency (MHz)
1	2	3	4 (not used)	
OFF	OFF	OFF		5860
ON	OFF	OFF		5860
ON	ON	OFF		5820
ON	ON	ON		5740
OFF	OFF	ON		5800
OFF	ON	ON		5760
ON	OFF	ON		5780
OFF	ON	OFF		5840

If you are operating this product in North America, you are required to have an Amateur Radio (HAM) license. Visit [www.arrl.org](http://www.arrl.org) for more information.

## AS3X Troubleshooting Guide

Problem	Possible Cause	Solution
Oscillation in flight	Damaged propeller	Replace propeller
	Propeller out of balance	Balance the propeller
	Motor vibration	Replace parts or correctly align all parts and tighten fasteners as needed
	Loose receiver	Align and secure receiver in fuselage
	Loose aircraft controls	Tighten or otherwise secure parts (servo, arm, linkage, horn and control surface)
	Worn parts	Replace worn parts (especially propeller or servo)
	Irregular servo movement	Replace servo
	Too high of gain value in AR636	Refer to the AR636 manual to reduce gain value.
Inconsistent flight performance	Trim is not at neutral	If you adjust trim more than 8 clicks, adjust the clevis to remove trim
	Sub-Trim is not at neutral	No Sub-Trim is allowed. Adjust the servo linkage
	Aircraft was not kept immobile for 5 seconds after battery connection.	With the throttle stick in lowest position. Disconnect battery, then reconnect battery and keep the aircraft still for 5 seconds
Incorrect response to the AS3X Control Direction Test	Incorrect direction settings in the receiver, which can cause a crash	<b>DO NOT fly.</b> Correct the direction settings (refer to the receiver manual)

## Troubleshooting Guide

Problem	Possible Cause	Solution
Aircraft will not respond to throttle but responds to other controls	Throttle not at idle and/or throttle trim too high	Reset controls with throttle stick and throttle trim at lowest setting
	Throttle servo travel is lower than 100%	Make sure throttle servo travel is 100% or greater
	Throttle channel is reversed	Reverse throttle channel on transmitter
	Motor disconnected from ESC	Make sure motor is connected to the ESC
Extra propeller noise or extra vibration	Damaged propeller and spinner, collet or motor	Replace damaged parts
	Propeller is out of balance	Balance or replace propeller
	Prop nut is too loose	Tighten the prop nut
	Spinner is not tight or fully seated in place	Tighten the spinner or remove the spinner and turn it 180 degrees
Reduced flight time or aircraft underpowered	Flight battery charge is low	Completely recharge flight battery
	Propeller installed backwards	Install propeller with numbers facing forward
	Flight battery damaged	Replace flight battery and follow flight battery instructions
	Flight conditions may be too cold	Make sure battery is warm before use
	Battery capacity too low for flight conditions	Replace battery or use a larger capacity battery

Problem	Possible Cause	Solution
Aircraft will not Bind to transmitter (during binding)	Transmitter too near aircraft during binding process	Move powered transmitter a few feet from aircraft, disconnect and reconnect flight battery to aircraft
	Aircraft or transmitter is too close to large metal object, wireless source or another transmitter	Move aircraft and transmitter to another location and attempt binding again
	The bind plug is not installed correctly in the bind port	Install bind plug in bind port and bind the aircraft to the transmitter
	Flight battery/transmitter battery charge is too low	Replace/recharge batteries
	Bind switch or button not held long enough during bind process	Power off transmitter and repeat bind process. Hold transmitter bind button or switch until receiver is bound
Aircraft will not connect to transmitter (after binding)	Transmitter too near aircraft during connecting process	Move powered transmitter a few feet from aircraft, disconnect and reconnect flight battery to aircraft
	Aircraft or transmitter is too close to large metal object, wireless source or another transmitter	Move aircraft and transmitter to another location and attempt connecting again
	Bind plug left installed in bind port	Rebind transmitter to the aircraft and remove the bind plug before cycling power
	Aircraft bound to different model memory (ModelMatch™ radios only)	Select correct model memory on transmitter
	Flight battery/Transmitter battery charge is too low	Replace/recharge batteries
	Transmitter may have been bound to a different aircraft using different DSM protocol	Bind aircraft to transmitter
Control surface does not move	Control surface, control horn, linkage or servo damage	Replace or repair damaged parts and adjust controls
	Wire damaged or connections loose	Do a check of wires and connections, connect or replace as needed
	Transmitter is not bound correctly or the incorrect airplanes was selected	Re-bind or select correct airplanes in transmitter
	Flight battery charge is low	Fully recharge flight battery
	BEC (Battery Elimination Circuit) of the ESC is damaged	Replace ESC
Controls reversed	Transmitter settings are reversed	Set all transmitter control directions to normal
Motor power pulses then motor loses power	ESC uses default soft Low Voltage Cutoff (LVC)	Recharge flight battery or replace battery that is no longer performing
	Weather conditions might be too cold	Postpone flight until weather is warmer
	Battery is old, worn out, or damaged	Replace battery
	Battery C rating might be too small	Use recommended battery
Horizontal lines in the headset display	Digital interference on the selected channel	Choose a cleaner channel
Static or “snow” in the FPV feed	The aircraft has reached the range limit for the video transmitter and receiver	Fly the aircraft back to within video range
	There is an obstruction between the aircraft and the video receiver	Do not fly behind objects such as buildings or trees
Static on all video channels	Video transmitter power is off	Connect the flight battery to the ESC. Check the video transmitter power connection
Blurry Image	Image is out of focus	Rotate the camera lens slowly to focus the camera

## Replacement Parts

Part #	Description	Part #	Description
BLH01001	Manta Airframe Only	IRLSN5G8RHSET	SpiroNet 5.8GHz RHCP Ant Set (2pc)
BLH01002	2221-1800kv Brushless Out-Runner Motor	CSE010012200	Talon 35 Helicopter ESC
SPMSH3050	H3050 Sub-Micro Digital Heli Cyclic MG Servo	FSV1204	700TVL WDR CMOS Fixed Mount FPV Camera with wide angle lens
IRL2101	600mW 5.8GHz A/V Transmitter	SPMAR636	AR636 6-Ch AS3X Sport Receiver

## Optional Parts

Part #	Description
EFLB22003S50	2200mAh 3S 11.1V 50C LiPo 13AWG EC3
EFLRB13004S35	Thrust™ 14.8V 1300mAh 35C 4S LiPo Battery
APC06040	Sport Propeller, 6 x 4
APC05545	Speed 400 Propeller, 5.5 x 4.5
SPMVR2500	Focal™ FPV Wireless Headset

## Limited Warranty

### What this Warranty Covers

Horizon Hobby, LLC, (Horizon) warrants to the original purchaser that the product purchased (the "Product") will be free from defects in materials and workmanship at the date of purchase.

### What is Not Covered

This warranty is not transferable and does not cover (i) cosmetic damage, (ii) damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance, (iii) modification of or to any part of the Product, (iv) attempted service by anyone other than a Horizon Hobby authorized service center, (v) Product not purchased from an authorized Horizon dealer, (vi) Product not compliant with applicable technical regulations, or (vii) use that violates any applicable laws, rules, or regulations.

OTHER THAN THE EXPRESS WARRANTY ABOVE, HORIZON MAKES NO OTHER WARRANTY OR REPRESENTATION, AND HEREBY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, 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

Horizon's sole obligation and purchaser's sole and exclusive remedy shall be that Horizon will, at its option, either (i) service, or (ii) replace, any Product determined by Horizon to be defective. Horizon 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 Horizon. 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

HORIZON 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 HORIZON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final 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 Illinois 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. Horizon reserves the right to change or modify this warranty at any time without notice.

### WARRANTY SERVICES

#### Questions, Assistance, and Services

Your local hobby store and/or place of purchase cannot provide warranty support or service. Once assembly, setup or use of the Product has been started, you must

contact your local distributor or Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please visit our website at [www.horizonhobby.com](http://www.horizonhobby.com), submit a Product Support Inquiry, or call the toll free telephone number referenced in the Warranty and Service Contact Information section to speak with a Product Support representative.

### Inspection or Services

If this Product needs to be inspected or serviced and is compliant in the country you live and use the Product in, please use the Horizon Online Service Request submission process found on our website or call Horizon to obtain a Return Merchandise Authorization (RMA) number. Pack the Product securely using a shipping carton. Please note that original boxes may 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 Horizon is not responsible for merchandise until it arrives and is accepted at our facility. An Online Service Request is available at [http://www.horizonhobby.com/content/\\_service-center\\_render-service-center](http://www.horizonhobby.com/content/_service-center_render-service-center). If you do not have internet access, please contact Horizon Product Support to obtain a RMA number along with instructions for submitting your product for service. When calling Horizon, you will be asked to provide your complete name, street address, email address and phone number where you can be reached during business hours. When sending product into Horizon, please include your RMA number, a list of the included items, and a brief summary of the problem. A copy of your original sales receipt must be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

**NOTICE:** Do not ship Li-Po batteries to Horizon. If you have any issue with a Li-Po battery, please contact the appropriate Horizon Product Support office.

### 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 serviced or replaced free of charge. Service or replacement decisions are at the sole discretion of Horizon.

### Non-Warranty Service

**Should your service not be covered by warranty, service will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost.** By submitting the item for service you are agreeing to payment of the service without notification. Service estimates are available upon request. You must include this request with your item submitted for service. Non-warranty service estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Horizon accepts money orders and cashier's checks, as well as Visa, MasterCard, American Express, and Discover cards. By submitting any item to Horizon for service, you are agreeing to Horizon's Terms and Conditions found on our website [http://www.horizonhobby.com/content/\\_service-center\\_render-service-center](http://www.horizonhobby.com/content/_service-center_render-service-center).

**ATTENTION: Horizon service is limited to Product compliant in the country of use and ownership. If received, a non-compliant Product will not be serviced. Further, the sender will be responsible for arranging return shipment of the un-serviced Product, through a carrier of the sender's choice and at the sender's expense. Horizon will hold non-compliant Product for a period of 60 days from notification, after which it will be discarded.** 10/15

## Warranty and Service Contact Information

Country of Purchase	Horizon Hobby	Contact Information	Address
United States of America	Horizon Service Center (Repairs and Repair Requests)	<a href="http://servicecenter.horizonhobby.com/RequestForm/">servicecenter.horizonhobby.com/RequestForm/</a>	4105 Fieldstone Rd Champaign, Illinois, 61822 USA
	Horizon Product Support (Product Technical Assistance)	<a href="mailto:productsupport@horizonhobby.com">productsupport@horizonhobby.com</a> 877-504-0233	
	Sales	<a href="mailto:websales@horizonhobby.com">websales@horizonhobby.com</a> 800-338-4639	
United Kingdom	Service/Parts/Sales: Horizon Hobby Limited	<a href="mailto:sales@horizonhobby.co.uk">sales@horizonhobby.co.uk</a> +44 (0) 1279 641 097	Units 1-4, Ployters Rd, Staple Tye Harlow, Essex, CM18 7NS, United Kingdom
Germany	Horizon Technischer Service Sales: Horizon Hobby GmbH	<a href="mailto:service@horizonhobby.de">service@horizonhobby.de</a> +49 (0) 4121 2655 100	Christian-Junge-Straße 1 25337 Elmshorn, Germany
France	Service/Parts/Sales: Horizon Hobby SAS	<a href="mailto:infofrance@horizonhobby.com">infofrance@horizonhobby.com</a> +33 (0) 1 60 18 34 90	11 Rue Georges Charpak 77127 Lieusaint, France

## FCC Information

This equipment has been tested and found to comply with the limits for Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**NOTICE:** Modifications to this product will void the user's authority to operate this equipment.

## IC Information

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.”

## Compliance Information for the European Union

### EU Compliance Statement:



Horizon Hobby, LLC hereby declares that this product is in compliance with the essential requirements and other relevant provisions of the R&TTE and EMC Directives.

A copy of the EU Declaration of Conformity is available online at: <http://www.horizonhobby.com/content/support-render-compliance>.



### 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 electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and make sure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.



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