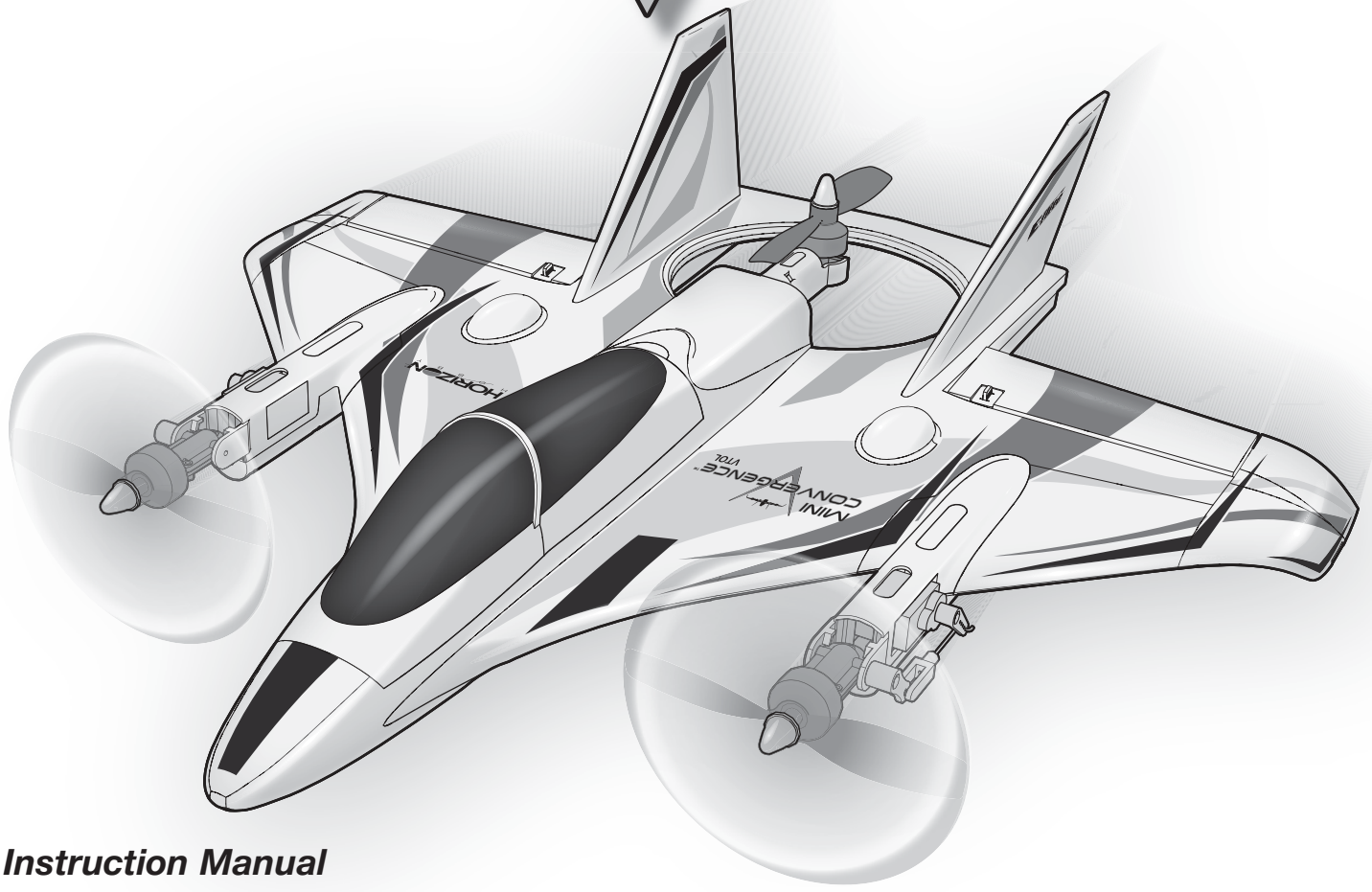
HORIZON HOBBY

E-flite
ADVANCING ELECTRIC FLIGHT

MINI V CONVERGENCE® VTOL



Instruction Manual
Bedienungsanleitung
Manuel d'utilisation
Manuale di Istruzioni

Bind-N-Fly® BASIC Plug-N-Play®

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 www.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:

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.

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

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

14+ **AGE RECOMMENDATION:**
Not for children under 14 years.
This is not a toy.

WARNING AGAINST COUNTERFEIT PRODUCTS: If you ever need to replace your Spektrum receiver 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.

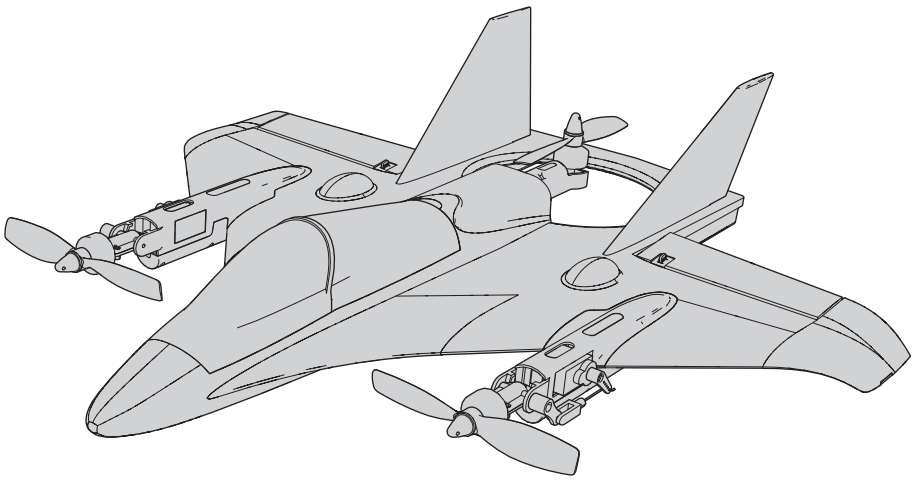
Safety Precautions and Warnings

As the user of this product, you are solely responsible for operating in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

- 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 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.
- Always ensure failsafe is properly set before flying.
- Never operate aircraft with damaged wiring.
- Never touch moving parts.

Box Contents

Quick Start Information	
Transmitter Setup	Set up your transmitter using the transmitter setup table
Center of Gravity (CG)	200-210mm from the nose of the airplane as shown in the *Center of Gravity* section (CG must be set with the motor nacelles in the multirotor flight, upright position)
Flight Timer Setting	5 minutes



Components

		BNF BASIC	PNP PLUG-N-PLAY
	Motors: (3) 1404-2500Kv Motors	**Installed**	**Installed**
ESC	**ESC:** (3) 6 AMP Brushless ESCs	**Installed**	**Installed**
	Servo: (2) 5g Sub-Micro Analog Air Servos (2) 3.7g Sub-Micro Analog Air Servos	**Installed**	**Installed**
RX	**Receiver:** Spektrum Quad Race Serial Receiver w/Diversity (SPM4648)	**Installed**	**Required**
	Recommended Battery: 11.1V 3S 800mAh 30C Li-Po (EFLB8003SJ30)	**Required**	**Required**
	Recommended Battery Charger: 3-cell Li-Po battery balancing charger	**Required**	**Required**
	Recommended Transmitter: Full-Range 6 channel 2.4GHz with Spektrum™ DSMX® technology	**Required**	**Required**

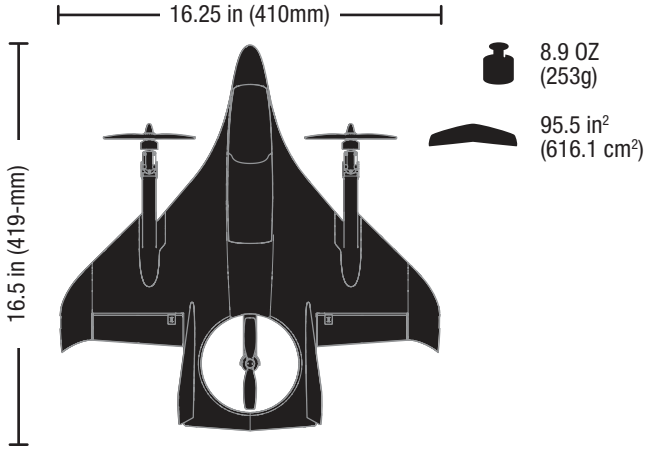


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RECEIVER BIND INFORMATION	
Channels	6
Frequency	2405 – 2476 MHz
Compatibility	DSM2 and DSMX

To receive product updates, special offers and more, register your product at www.e-fliterc.com

As of this printing, may be 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/.

Preflight

1. Remove and inspect contents.	9. Make sure linkages move freely.
2. Read this instruction manual thoroughly.	10. Perform the Control Direction Test with the transmitter.
3. Charge the flight battery.	11. Perform the stability system control direction test with the aircraft.
4. Setup Transmitter using transmitter setup chart.	12. Adjust flight controls and transmitter.
5. Fully assemble the airplane.	13. Perform a radio system Range Test.
6. Install the flight battery in the aircraft (once it has been fully charged).	14. Find a safe open area to fly.
7. Check the Center of Gravity (CG).	15. Plan flight for flying field conditions.
8. Bind the aircraft to your transmitter.	

Transmitter Setup

The Mini Convergence® aircraft requires a transmitter with a minimum of 6 channels and 2 open two-position switches.

Acro and Stability Flight Modes are selected with channel 5 (GEAR).

The transition from Multirotor Flight Mode to Airplane Flight Mode is controlled by channel 6 (AUX 1).

IMPORTANT: After the model is set up, always rebind the transmitter and receiver to set the desired failsafe positions.

Expo: After the first few flights, adjust expo up or down in the transmitter to better suit your flying style.

Tip: Set the throttle trim at a high idle during flight, and use a throttle cut switch to shut the motors off. Shutting the motors off on this aircraft will cause the model to descend rapidly in Multirotor Flight Mode. Keeping the motors turning at the low throttle point will produce a more manageable descent rate when the throttle is reduced.

Refer to your transmitter manual for additional safety information.

Computerized Transmitter Setup
(DXe*, DX6e, DX6, DX7 (Gen2), DX8 (Gen2), DX9, DX18, DX20, and iX12)

Start all transmitter programming with a blank ACRO (Airplane) model (perform a model reset), then name the model.	
Set Expo values to	Elevator 10% Aileron 10% Rudder 0%
Set Servo Travel to	100%
D/R Low	70%
D/R High	100%
Throttle Cut	-130% Select any switch other than A or H

DX6 (Gen2) DX7 (Gen2) DX8 (Gen2) DX9 DX18 DX20 iX12	1. Go to the SYSTEM SETUP 2. Set MODEL TYPE: AIRPLANE 3. Set AICRAFT TYPE: WING: NORMAL 4. Set CHANNEL ASSIGN: (NEXT) CHANNEL INPUT CONFIG: GEAR: A AUX1: H

* To download the Mini Convergence® setup for the DXe, DX6–DX20 or iX12 visit *www.spektrumrc.com.*

Transmitter and Receiver Binding

This product requires an approved Spektrum™ DSM2®/DSMX® compatible transmitter. Visit *www.bindnfly.com* for a complete list of approved transmitters.

IMPORTANT: Before binding a transmitter, read the *Transmitter Setup* section to ensure that your transmitter is properly programmed for this aircraft.

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

Bind Procedure (BNF)

1. Confirm the transmitter is powered off.
2. Center all trims and move the throttle stick to the lowest position.
3. Place the aircraft on a level surface. Connect the flight battery to the flight controller. The motors will produce a tone indicating power. After 10 seconds the orange LED on the receiver will flash indicating it is ready to bind.
4. Take 3 steps away from the aircraft/receiver and then power ON the transmitter in bind mode. Refer to your transmitter's manual for specific binding instructions.
5. The receiver is bound to the transmitter when the LED on the receiver glows solid orange.

   IMPORTANT: The flight controller will not arm the ESCs if the throttle is not in the lowest position and the throttle trim at or below center.

IMPORTANT: After binding the receiver and transmitter for the first time, the transmitter must be powered on first, before the aircraft. Failure to power on the transmitter first will cause the receiver to automatically go into bind mode and requiring the transmitter and receiver to have to be re-bound.

Battery Installation and ESC Arming

Battery Selection

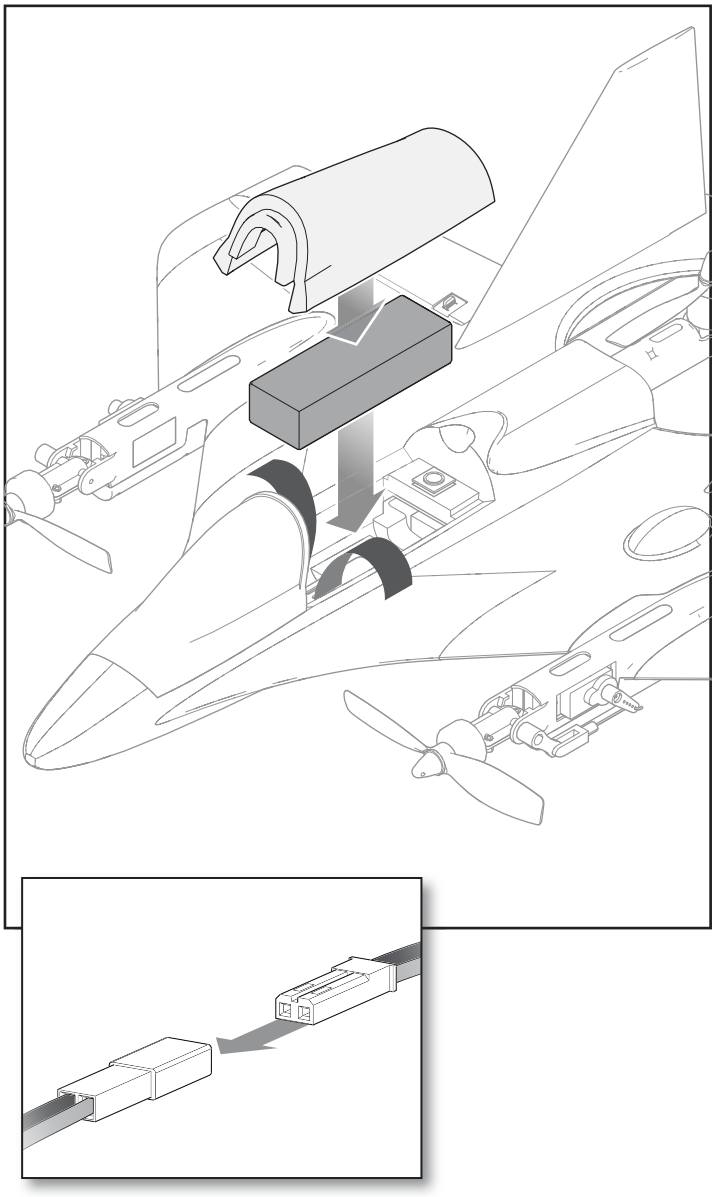
We recommend the E-flite® 800mAh 11.1V 3S 30C Li-Po battery (EFLB8003S30). Refer to the *Optional Parts* list for other recommended batteries. If using a battery other than those listed, the battery should be within the range of capacity, dimensions and weight of the E-flite Li-Po battery packs to fit in the fuselage.

1. Lower the throttle and throttle trim to the lowest settings. Set the switches to Multirotor and Stability Mode. Power on the transmitter and wait approximately 5 seconds.
2. Carefully lift the back of the battery hatch and pull back to remove it.
3. Install the fully charged battery in the battery compartment as shown. Secure using the hook and loop strap.
4. Connect the battery to the flight controller.
5. Keep the aircraft upright, immobile and away from wind or the system will not initialize.
   - The motor nacelles will rotate to the middle position briefly and then to the upright, multirotor flight position, indicating the flight controller has initialized and the ESCs are armed.

CAUTION: Always keep hands away from the propeller. When armed, the motor will turn the propeller in response to any throttle movement.

⚠ 6. Reinstall the battery hatch.

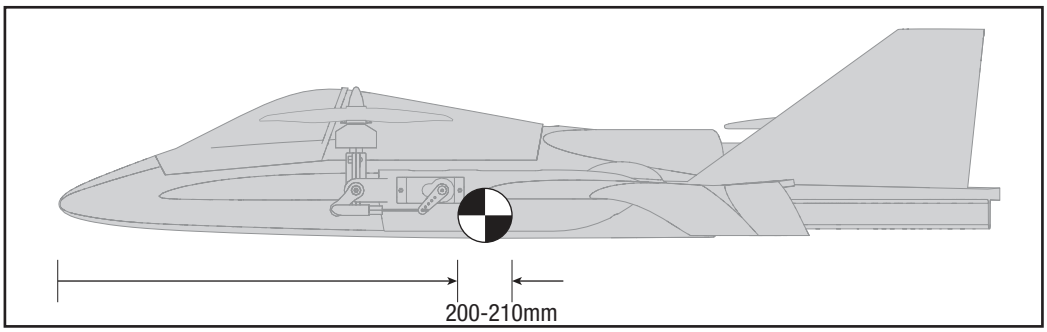
7. Refer to the Center of Gravity section to ensure the model balances at the recommended CG.



Center of Gravity (CG)

The CG location is within 200-210mm, measured from the nose of the airplane as shown in the illustration.

⚠ **CAUTION:** The main motor nacelles must be in the Multirotor Flight Mode (upright) when checking the center of gravity. Failure to do so will give an incorrect center of gravity and may cause a crash. Crash damage is not covered under warranty.



Flight Conditions

Stability and Acro Flight Modes are available in both Airplane Flight Mode and Multirotor Flight Mode. The basic function of each mode is the same regardless of what realm of flight is active.

Stability Mode

Stability Mode limits the bank and pitch angle of the aircraft. The aircraft will self-level if you release the transmitter sticks.

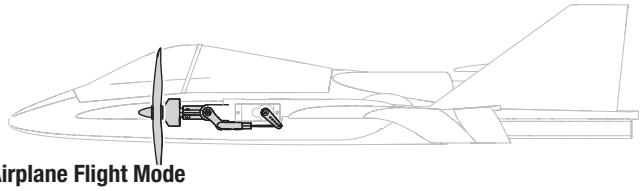
Acro Mode

Acro Mode removes the bank angle limits and will not self-level the aircraft if you release the transmitter sticks. Acro Mode is intended for experienced pilots who are comfortable flying the aircraft in any orientation.

The following table gives the switch positions and a brief description of the possible flight conditions available.

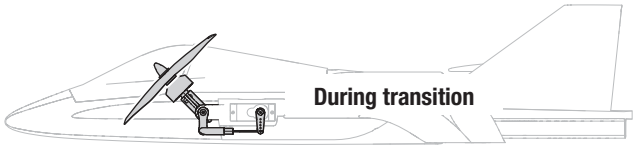
	Multirotor Flight Mode (Switch H, Position 1)	**Airplane Flight Mode** (Switch H, Position 0)
Stability Mode (Switch A, Position 0)	• Limited bank angle • Very little pitch change • Forward and backward flight is achieved through angling of the main motor nacelles • Self-levelling • Elevons inactive • Tail motor runs • Use this condition for all takeoffs and landings	• Limited bank angle • Self-levelling • Elevons active • Tail motor does not run • Do not attempt to land or takeoff in this condition
Acro Mode (Switch A, Position 1)	• Unlimited bank and pitch angles • Does not self- level • Elevons inactive • Tail motor runs • Do not attempt to land or takeoff in this condition if you are an inexperienced pilot	• Unlimited bank and pitch angles • Does not self-level • Elevons active • Tail motor does not run • Do not attempt to land or takeoff in this condition

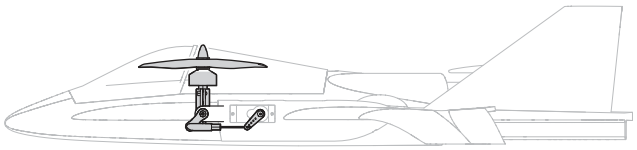
Motor Nacelle Positions



Airplane Flight Mode

Motor position may vary slightly depending on aircraft orientation and current flight mode.





Multirotor Flight Mode

Motor position may vary slightly depending on aircraft orientation and current flight mode.

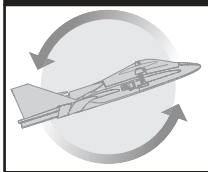
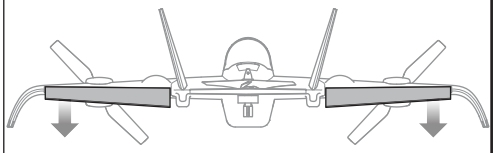
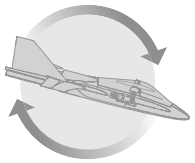
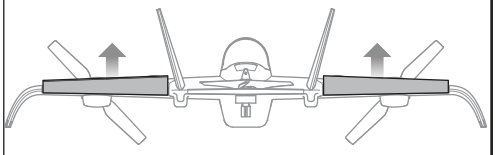
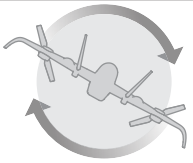
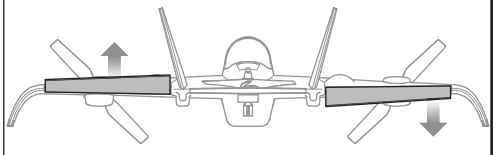
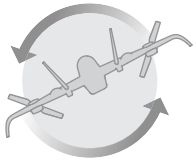
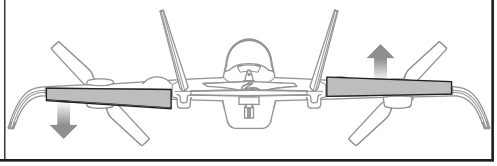
Flight Control Direction Test

This test ensures that the flight control system is functioning properly. Assemble the aircraft, bind your transmitter to the receiver, and ensure the aircraft is in Airplane Flight Mode/ Stability Mode before performing this test. The control surfaces will not respond in Multirotor Flight Mode.

Move the entire aircraft as shown in the table and ensure the control surfaces respond in the direction as shown. If the control surfaces do not respond as shown, do not fly the aircraft. Contact Horizon Product Support.

Once the flight control system is active, control surfaces may move rapidly. This is normal.

CAUTION: Keep all body parts, hair and loose clothing away from a moving propeller, as these items could become entangled.

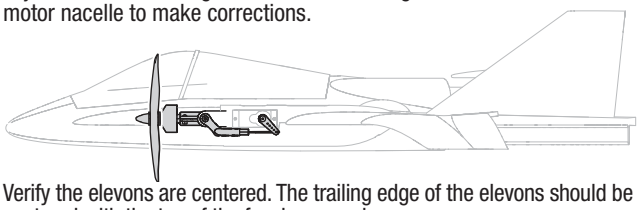
Aircraft Movement	Elevon Reaction
	
	
	
	

Linkage Settings and Flight Trimming

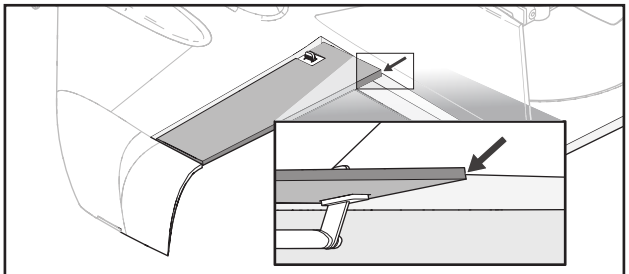
The table to the right shows the factory settings for the control horns and servo arms. Fly the aircraft at factory settings before making any changes to the elevon linkages.

Trim

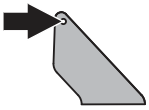
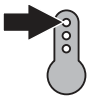
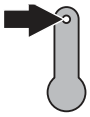
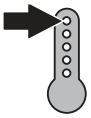
1. With the model sitting on the ground and the motors off, verify the motor nacelles are positioned level in Airplane Flight Mode with Acro Mode. Make adjustments to the length of the control linkages between the servo and the motor nacelle to make corrections.



2. Verify the elevons are centered. The trailing edge of the elevons should be centered with the top of the fuselage, as shown.
   With the airplane in Hover Flight Mode and Stability Mode, make adjustments to the length of the control linkages between the servo and elevons.



NOTE: This is a starting point. Trim may very slightly.

	Control Horns	Servo Arms
Elevons		
Motor Nacelles		

3. Fly the airplane and trim the aileron and elevator controls for level flight in Airplane Flight Mode and Acro Mode at full power.
4. Land the model and place it on a level surface with the motors off. Switch into Airplane Flight Mode then switch from Acro Mode to Stability and back to Acro to clear the gyro. Keep the model motionless in Airplane Flight Mode and Acro Mode and note the trim position.

Important: The elevons will respond to any movement when in Airplane Flight Mode. The elevons will not respond to movement in Multirotor Flight Mode. Keep the model in Multirotor Flight Mode to make physical trim changes.

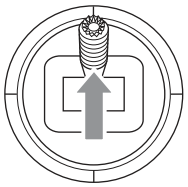
5. Put the model into Multirotor Flight Mode to center the elevons.
6. Adjust the length of the control linkages to set the elevons at the noted trim positions.
7. Reset the transmitter trims to neutral before flying again.

Understanding the Primary Flight Controls

The Mini Convergence® aircraft has Flight Modes that make it capable of flying forward like an airplane or hovering like a multirotor. It is important to understand how the primary flight controls function and how the aircraft reacts in both flight modes. Take a few minutes to familiarize yourself with the controls prior to attempting your first flight.

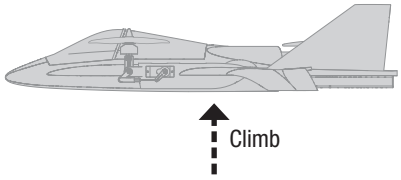
Multirotor Flight Mode

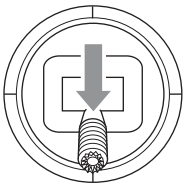
Throttle



Throttle up

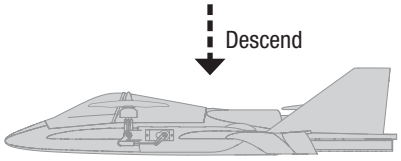
Left side view



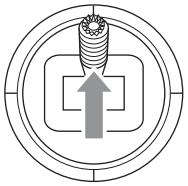


Throttle down

Left side view

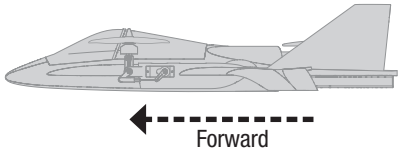


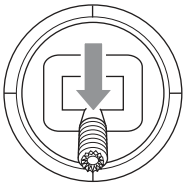
Elevator



Elevator down

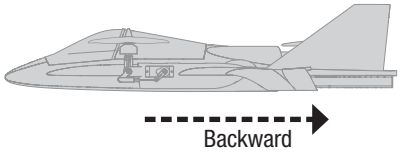
Left side view





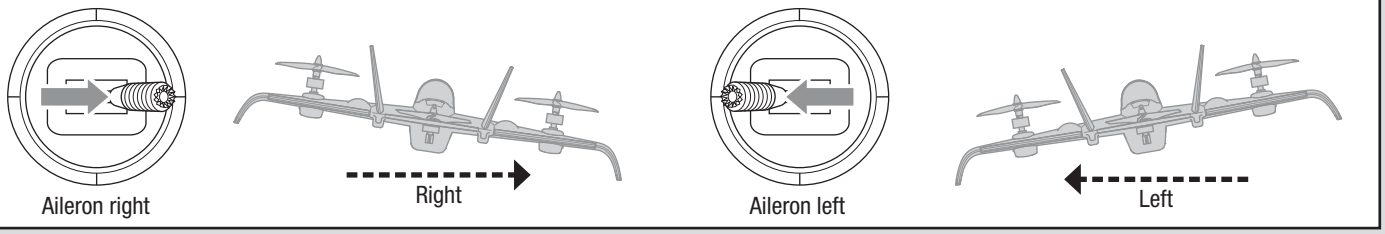
Elevator up

Left side view

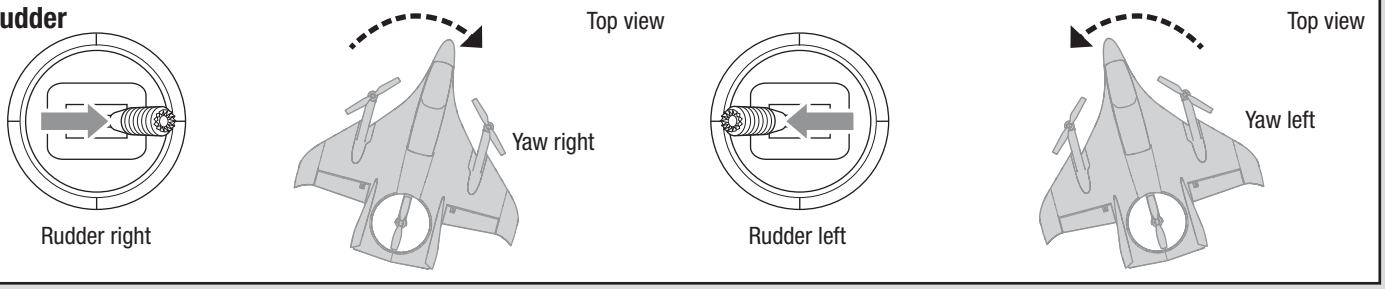


Multirotor Flight Mode

Aileron

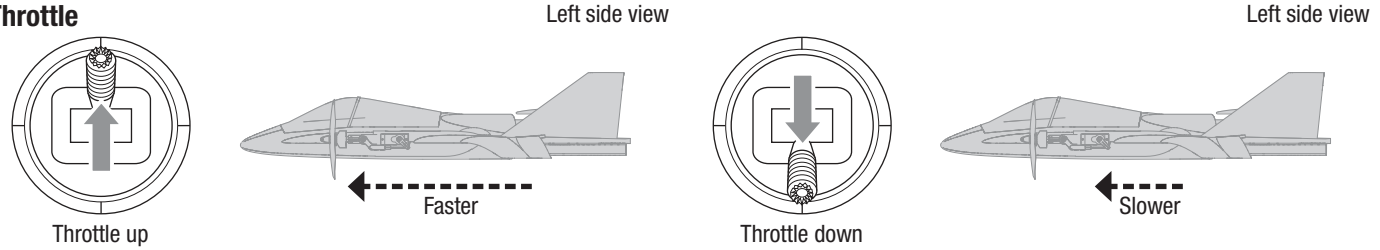


Rudder

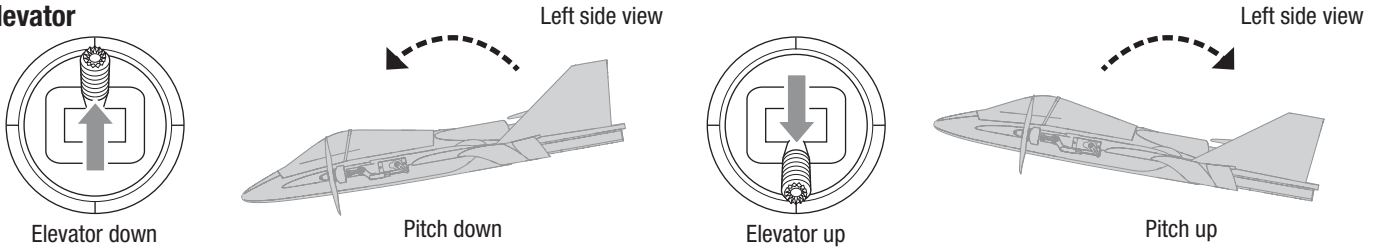


Airplane Flight Mode

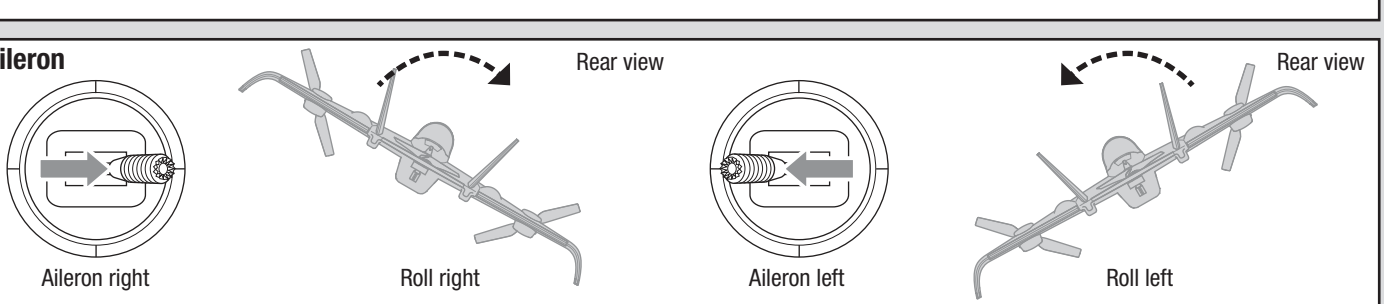
Throttle



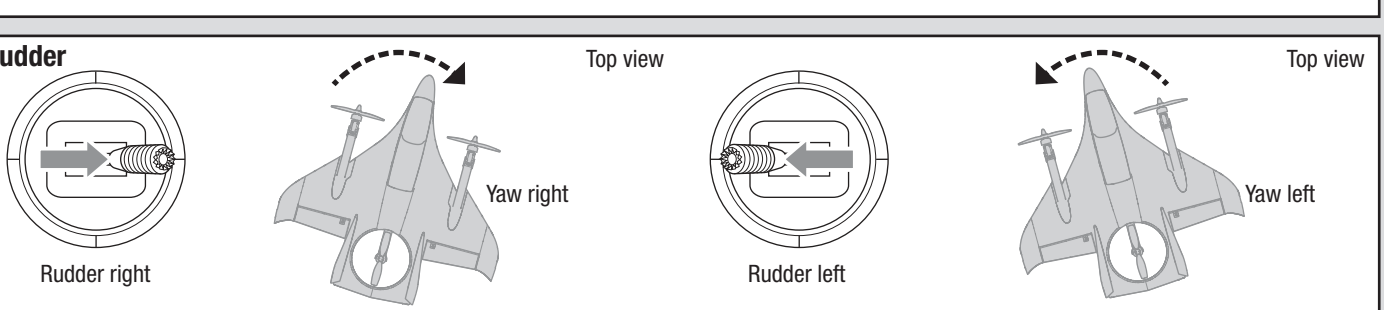
Elevator



Aileron



Rudder



Flying Your Aircraft

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.

Just Before Flight

Once the flight control system is active, you will normally see the control surfaces react to aircraft movement.

For your first flights with the recommended battery pack (EFLB8003S30), set your transmitter timer or a stopwatch to 5 minutes.

NOTICE: Never fly the aircraft without first setting and activating a timer.

After 5 minutes, land the aircraft. Adjust your timer for longer or shorter flights depending on your preference and battery usage.

Takeoff

NOTICE: All takeoffs and landings must be done in Multirotor Flight Mode. Attempting to land in Airplane Flight Mode will damage the motors and nacelles possibly causing a crash. Crash damage is not covered under warranty.

Place the aircraft on a flat, level surface with the tail facing you. Set your transmitter to Multirotor Flight Mode and Stability Mode. Ramp up the throttle trim to keep the propellers turning.

Tip: Stability mode is highly recommended for the first few takeoffs and landings, until you become familiar with how the aircraft reacts to control inputs.

Check that the motor nacelles are in the fully upright position in Multirotor Flight Mode before applying throttle. Gradually increase the throttle until the model is approximately 2 ft. (600mm) off the ground. Avoid forcing the aircraft into the air.

Multirotor Flight

Using Stability Mode to begin, try to hold the aircraft in one spot small with small corrections on the transmitter control sticks. If flying in calm winds, the model should require almost no corrective inputs. After moving the aileron/elevator stick and returning it to center the model will level itself (when flying in Stability Mode). The model may continue to move due to inertia. Move the stick in the opposite direction to stop the movement.

After you become comfortable hovering, you can progress into flying the model to different locations, keeping the tail pointed towards you at all times. You can also ascend and descend using the throttle stick.

Once you are comfortable with these maneuvers, you can attempt flying with the tail in different orientations. It is important to keep in mind that the flight control inputs will rotate with the aircraft, so always try to picture the control inputs relative to the nose of the aircraft.

NOTICE: Do not attempt to fly backwards at a high rate of speed. While the aircraft is capable of flying backwards while in multirotor mode, the aircraft becomes more unstable as backward speed increases due to airflow over the fixed wings.

Transitioning In Flight

To transition to Airplane Flight Mode from Multirotor Flight Mode change the flight attitude switch on your transmitter to the Airplane Flight Mode. The throttle will increase slightly and the motor nacelles will rotate forward in three stages to the airplane flight position. The elevons become active. It is normal to have some slight oscillations in pitch as the aircraft transitions into Airplane Flight Mode. While in Airplane Flight Mode the main motors use differential thrust to provide yaw control and the tail motor does not run.

To transition to Multirotor Flight Mode from Airplane Flight Mode reduce the airspeed, change the switches on your transmitter to select the Multirotor Flight Mode and Stability Mode for landing. The throttle will increase slightly and the motor nacelles will rotate to the vertical position. The tail motor will power on and the elevons will go to neutral. While in Multirotor Flight Mode the elevons do not move. All pitch, roll and yaw control is accomplished by differential thrust and angling of the motors.

NOTICE: Do not transition to Multirotor Flight Mode at low throttle or lower the throttle immediately after transitioning to Multirotor Flight Mode. Doing so will cause a rapid loss of altitude and possibly a crash.

Airplane Flight

Fly the aircraft and trim it for level flight per the *Trimming Your Aircraft* section.

The Convergence flies in a very similar manner to any other fixed-wing aircraft. It is capable of a wide range of aerobatic maneuvers including loops, rolls and spins. Additionally, the differential thrust of the motors allows for unique spinning and tumbling maneuvers.

Landing

NOTICE: All takeoffs and landings must be done in Multirotor Flight Mode. Attempting to land in airplane mode will damage the motors and rotation mechanisms possibly causing a crash. Crash damage is not covered under warranty.

Transition the aircraft into Multirotor Flight Mode and bring it into a low hover. Slowly lower the throttle to descend to a soft landing.

NOTICE: If a crash is imminent, activate the throttle cut feature. Failure to do so could result in extra damage to the airframe, as well as damage to the ESCs, motors and motor nacelles.

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)

The average flight time with a mixture of hovering and airplane flight using the recommended flight battery is approximately 5 minutes.

The flight controller protects the flight battery from over-discharge using Low Voltage Cutoff (LVC). When the flight battery is drained to LVC the flight controller will automatically transition the motors into Multirotor Flight Mode and change to Stability Mode. The remaining battery will last less than a minute, so land the aircraft as soon as possible.

When the battery reaches LVC in Multirotor Flight Mode the motor power is sharply reduced for an instant to warn the pilot the model has entered LVC and the model is set to Stability Mode if it isn't already. In this flight condition the motors will slowly lose power until the ESCs cutoff. If you notice the motors cut power for a brief moment, land immediately and re-charge the flight battery.

After landing, disconnect and remove the Li-Po battery from the aircraft to prevent trickle discharge. Charge your Li-Po battery to approximately 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 may damage the battery.

Tip: Monitor your aircraft battery's voltage before and after flying by using a Li-Po Cell Voltage Checker (EFLA111, sold separately).

Repairs

Thanks to the foam material in this aircraft, repairs to the foam can be made using virtually any adhesive (hot glue, regular CA, epoxy, etc). When parts are not repairable, see the Replacement Parts List for ordering by item number. For a listing of all replacement and optional parts, refer to the list at the end of this manual.

Post Flight

1. Disconnect the flight battery from the flight controller (Required for Safety and battery life).
2. Power OFF the transmitter.
3. Remove the flight battery from the aircraft.
4. Recharge the flight battery.
5. Repair or replace all damaged parts.
6. Store the flight battery apart from the aircraft and monitor the battery charge.
7. Make note of the flight conditions and flight plan results, planning for future flights.

Motor Service

CAUTION: Always disconnect the flight battery before performing motor service.

Main Motor Removal

1. Disconnect the motor wires from the ESC.
2. Remove the spinner nut.
3. Remove the propeller from the motor shaft.
4. Remove the two screws that secure the motor mount to the nacelle.
5. Remove the three screws that clamp the motor mount together.
6. Separate the motor mount and remove the motor.

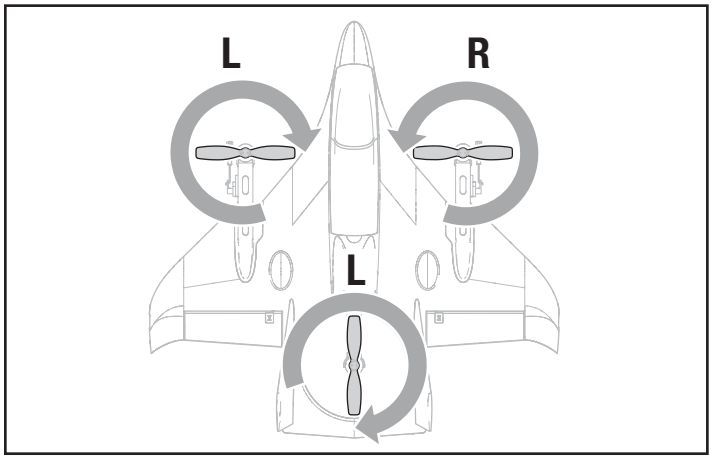
Assembly is the reverse of the removal process.

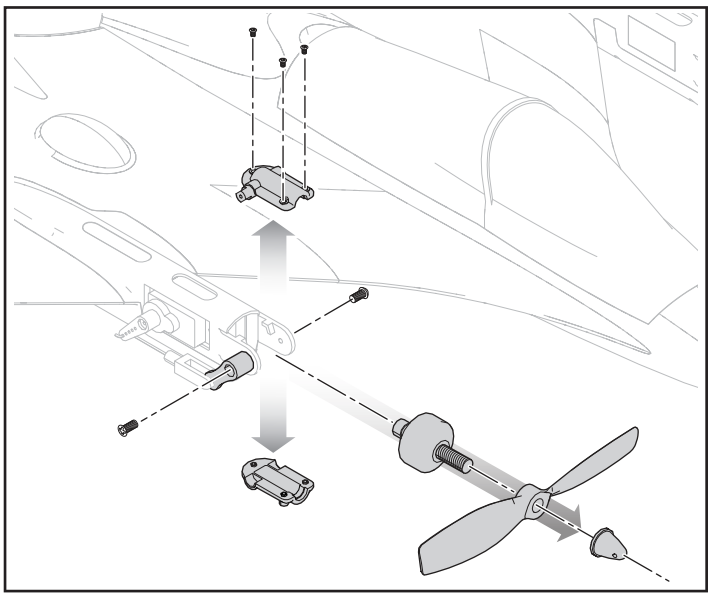
Tail Motor Removal

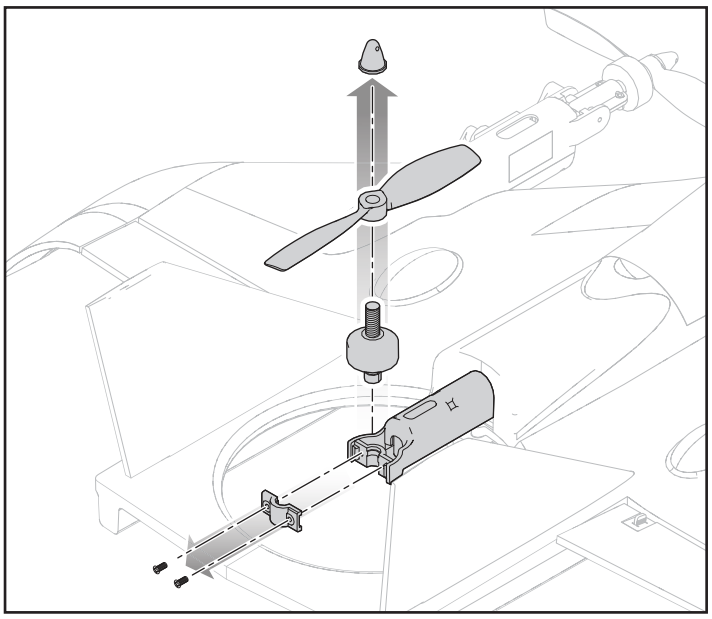
1. Disconnect the tail motor wires from the ESC.
2. Remove the spinner nut.
3. Remove the propeller from the motor shaft.
4. Remove the two screws from the tail motor mount
5. Separate and remove the rear half of the motor mount.
6. Remove the tail motor from the mount.

Assembly is the reverse of the removal process

IMPORTANT: Always install the propellers on the matching motor so the L propeller is on the L motor and the R propeller is on the R motor. If the motor spins backward after the wires are disconnected and reconnected, swap any two of the three motor wires to reverse the motor.





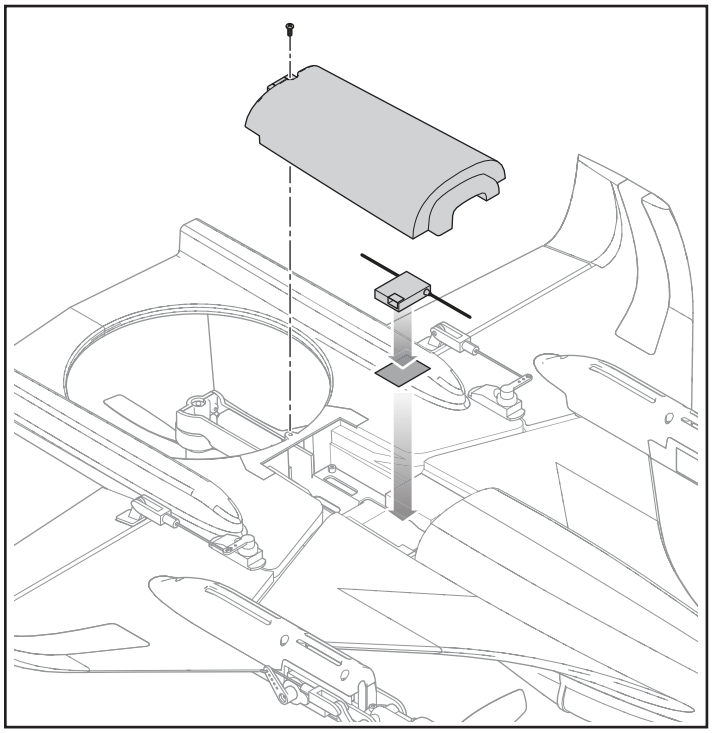


PNP Receiver Selection and Installation

The Convergence aircraft uses the Spektrum™ DSMX® serial receiver (SPM4648), included in the BNF-Basic aircraft,

Installation of a DSMX serial receiver

1. Remove the bottom cover from the fuselage.
2. Mount the receiver to the fuselage as shown using double-sided servo tape or hook and loop material.
3. Attach the serial receiver lead to the receiver and to the flight control board.
4. Replace the bottom fuselage cover.



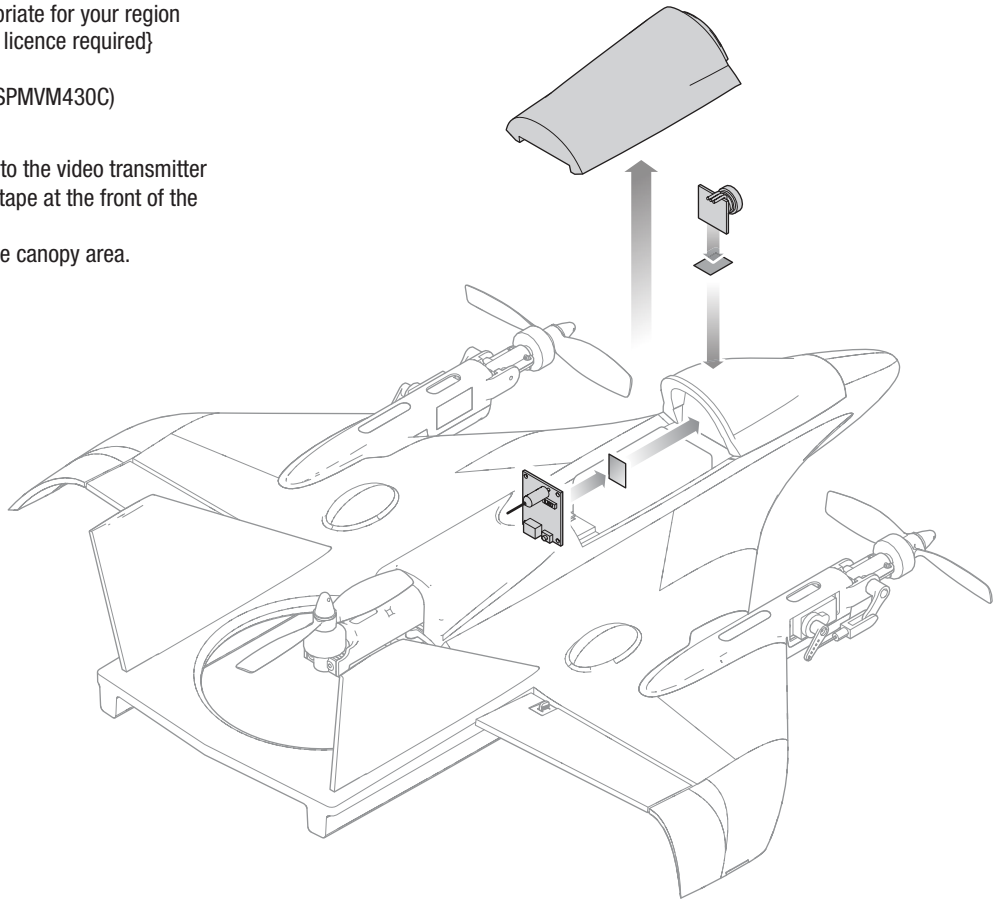
FPV System Installation (Optional)

Items required for FPV installation:

- Camera, 600TVL CMOS FPV Camera (SPMVCM01)
- Video transmitter with the power output appropriate for your region SPMVTM150 for North America (Amateur radio licence required} SPMVTM025
- 5.8GHz FPV headset or monitor (SPMVR2520, SPMVM430C)

Installation of optional FPV camera:

1. Connect the FPV power cable from the aircraft to the video transmitter
2. Mount the video transmitter with double sided tape at the front of the battery area.
3. Mount the camera with double sided tape to the canopy area.



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
	Motors disconnected from ESCs	Make sure motors are connected to the ESCs
Extra propeller noise or extra vibration	Damaged propeller or motor	Replace damaged parts
	Propeller is out of balance	Balance or replace propeller
	Prop nut is too loose	Tighten the prop nut
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
Aircraft will not Bind (during binding) to transmitter	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
	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 (after binding) to transmitter	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
	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
	Flight controller is damaged	Replace the flight controller
	Transmitter is set to Hover Flight Mode	Set the transmitter switch to Airplane Flight Mode
Controls reversed	Transmitter settings are reversed	Perform the Control Direction Test and adjust the controls on transmitter appropriately
Oscillation	Damaged propeller or spinner nut	Replace propeller or spinner nut
	Imbalanced propeller	Balance the propeller
	Motor vibration	Replace parts or correctly align all parts and tighten fasteners as needed
	Loose flight controller	Align and secure the flight controller in fuselage
	Loose aircraft controls	Tighten or otherwise secure parts (servo, arm, linkage, horn and control surface)
	Worn parts	Replace worn parts (especially propeller, spinner nut or servo)
	Irregular servo movement	Replace servo
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 upright and 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
Aircraft will not transition to or will not stay in airplane flight mode	Low battery. Low Voltage Cutoff is being triggered.	Recharge flight battery or replace battery that is no longer performing
Aircraft immediately flips or crashes on throttle up	Main propellers installed incorrectly	Install the propellers with the “R” propeller on the right side motor and the “L” propeller on the left side motor.

AMA 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 man 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 Aircraft 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 which could adversely affect the pilot's ability to safely control the model.
   (i) Not operate model aircraft carrying pyrotechnic devices which explode or burn, or any device which propels a projectile or drops any object that creates a 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

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 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 flight line.
7. Under no circumstances may a pilot or other person touch a 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 a 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.

Please see your local or regional modeling association's guidelines for proper, safe operation of your model aircraft.

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, or (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, 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. 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 LiPo batteries to Horizon. If you have any issue with a LiPo 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.

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

Contact Information

Country of Purchase	Horizon Hobby	Contact Information	Address
United States of America	Horizon Service Center (Repairs and Repair Requests)	servicecenter.horizonhobby.com/RequestForm/	1608 Interstate Drive Champaign, Illinois, 61822 USA
	Horizon Product Support (Product Technical Assistance)	productsupport@horizonhobby.com 877-504-0233	
	Sales	websales@horizonhobby.com 800-338-4639	
European Union	Horizon Technischer Service	service@horizonhobby.eu +49 (0) 4121 2655 100	Hanskampring 9 D 22885 Barsbüttel, Germany
	Sales: Horizon Hobby GmbH		

FCC Information

FCC ID: BRWSPMR4648A

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to 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.
- Consult the dealer or and experienced radio/TV technician for help.

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.

This product contains a radio transmitter with wireless technology which has been tested and found to be compliant with the applicable regulations governing a radio transmitter in the 2.400GHz to 2.4835GHz frequency range.

IC Information

IC ID: 6157A-SPMR4648A

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

Mini Convergence BNF Basic (EFL9350)

EU Compliance Statement: Horizon Hobby, LLC hereby declares that this product is in compliance with the essential requirements and other relevant provisions of the RED and EMC Directive.

Mini Convergence PNP (EFL9375)

EU Compliance Statement: Horizon Hobby, LLC hereby declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive.

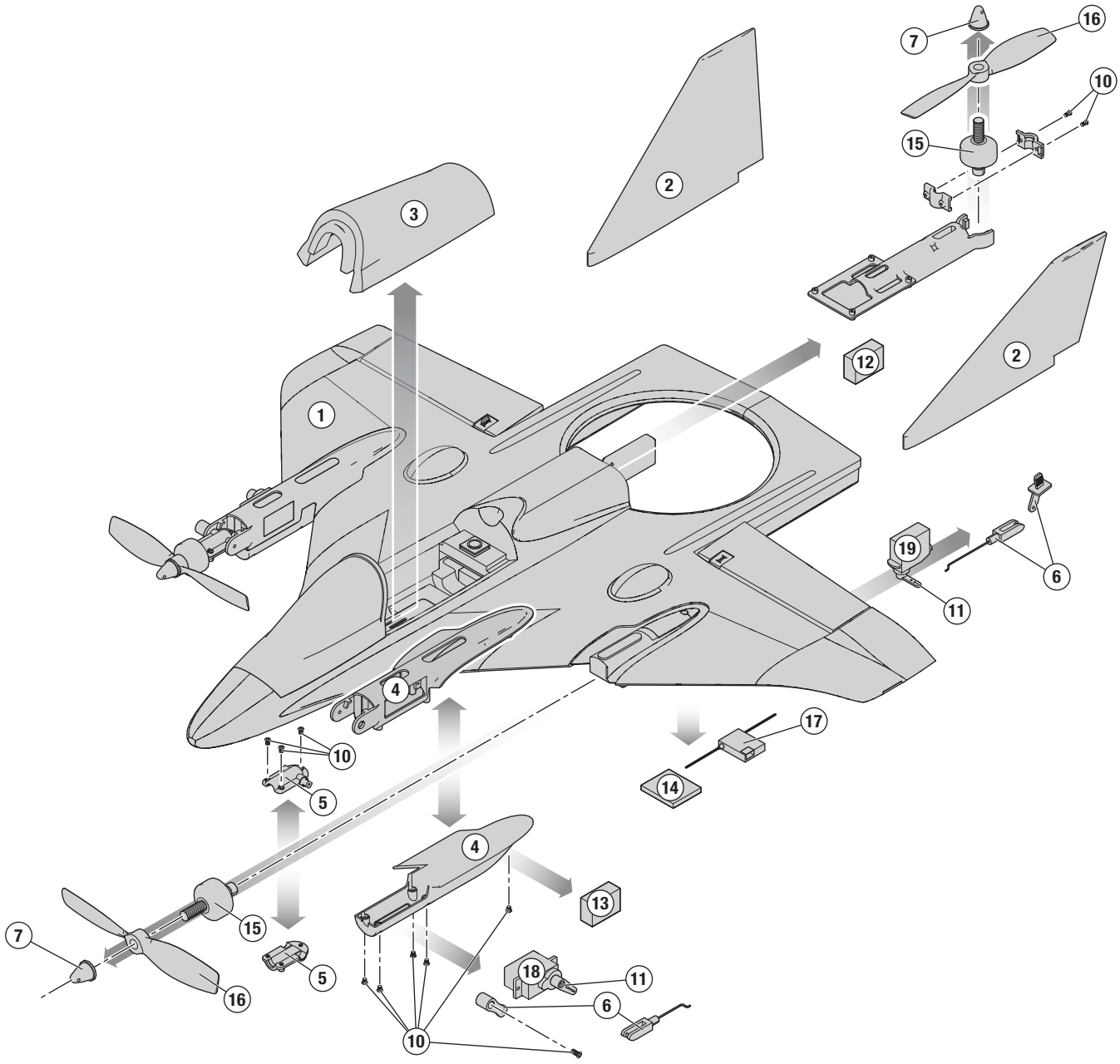
A copy of the EU Declaration of Conformity is available online at: http://www.horizonhobby.com/content/support-render-compliance.

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 ensure 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.

E328

Exploded View / Explosionszeichnung / Vue Éclatée / Vista Esplosa



Replacement Parts • Ersatzteile • Pièces de rechange • Pezzi di ricambio

	Part # / Nummer Numéro / Codice	Description	Beschreibung	Description	Descrizione
1	EFL9301	Replacement Airframe: Mini Convergence	Ersatzflugzeug: Mini Convergence	Cellule de remplacement: Mini Convergence	Telaio di ricambio: Mini Convergence
2	EFL9302	Tail set: Mini Convergence	Schwanzset: Mini Convergence	Queue ensemble: Mini Convergence	Set di coda: Mini Convergence
3	EFL9303	Hatch Set: Mini Convergence	Luken-Set: Mini-Konvergenz	Hatch Set: Mini Convergence	Set di tratteggio: Mini convergenza
4	EFL9304	Nacelle Set: Mini Convergence	Gondel-Set: Mini-Konvergenz	Nacelle Set: Mini Convergence	Set di gondole: Mini Convergence
5	EFL9305	Motor Mount Set:Mini Convergenc	Motorhalterung: Mini Convergenc	Ensemble de montage moteur: Mini Convergenc	Set di montaggio motore: Mini Convergenc
6	EFL9306	Pushrod Set: Mini Convergence	Schubstangenset: Mini Convergence	Jeu de poussoirs: Mini Convergence	Set di puntali: Mini Convergence
7	EFL9307	Spinner Nut: Mini Convergence	Spinner-Nuss: Mini-Konvergenz	Spinner Nut: Mini Convergence	Spinner Nut: Mini Convergence
8	EFL9308	Decal Sheet Set:Mini Convergence	Aufklebersatz: Mini Convergence	Ensemble de feuilles de décalque: Mini Convergence	Set di adesivi per decalcomanie: Mini Convergence
9	EFL9309	Servo Lead Tape: Mini Convergence	Servo Bleiband: Mini Konvergenz	Servo Lead Tape: Mini Convergence	Servo Lead Tape: Mini Convergence
10	EFL9310	Screw Set: Mini Convergence	Schraubensatz: Mini Convergence	Ensemble de vis: Mini Convergence	Set di viti: Mini Convergence
11	EFL9311	Servo Arm Set: Mini Convergence	Servo Arm Set: Mini Konvergenz	Ensemble de bras de servo: Mini Convergence	Servo Arm Set: Mini Convergence
12	EFLA9313	6 amp ESC: Mini Convergence	6 Ampere ESC: Mini Konvergenz	6 ampères ESC: Mini Convergence	6 amp ESC: Mini Convergence
13	EFLA9313L	6amp ESC LongLeadMiniConvergenc	6amp ESC LongLeadMiniConvergenc	6amp ESC LongLeadMiniConvergenc	6amp ESC LongLeadMiniConvergenc
14	EFLA9314	Flight ControllerMiniConvergenc	Flug ControllerMiniConvergenc	Contrôleur de volMiniConvergenc	Flight ControllerMiniConvergenc
15	EFLM9312	Brushless Motor 1404-2100kv	Bürstenloser Motor 1404-2100kv	Moteur sans balais 1404-2100kv	Motore Brushless 1404-2100kv
16	EFLP04024	4x2.4 Prop L(2)&R(2)MiniConverg	4x2.4 Prop L (2) & R (2) MiniConverg	4x2.4 Prop L (2) et R (2) MiniConverg	4x2.4 Prop L (2) & R (2) MiniConverg
17	SPM4648	Spektrum Quad Race Receiver w/diversity	Spektrum Quad Race Empfänger mit Diversity	Récepteur serial pour quadcoptère avec Diversity	Ricevente seriale Spektrum Quad Race con modulo Diversity
18	SPMSA350	5g Sub-Micro Analog Air Servo	5g Sub-Micro Analog-Luftservo	Servo Air Analogique Sub-Micro 5g	Servo d'aria analogico sub-micro 5g
19	SPMSA360	3.7g Sub-Micro Analog Air Servo	3.7g Sub-Mikro-Analog-Luftservo	Servo Air Analogique Sub-Micro 3.7g	3.7g Servo d'aria analogico sub-micro

Optional Parts • Optionale Bauteile • Pièces optionnelles • Pezzi opzionali

Part # / Nummer Numéro / Codice	Description	Beschreibung	Description	Descrizione
KXST0051	Ult Air/Surface Start Tool St	Ulti - Luft / Oberflächen Start Werkzeug St	Ult Air / Surface Start Outil St	Utensile per avvio aria / superficie Ult
SPMVCM01	FPV Camera: Torrent 110 FPV	FPV-Kamera: Torrent 110 FPV	Caméra FPV: Torrent 110 FPV	Telecamera FPV: Torrent 110 FPV
SPMVR2510	Focal V2 FPV Wireless Headset w/div	Focal V2 FPV Wireless Headset mit Div	Casque sans fil Focal V2 FPV w / div	Focale V2 FPV Wireless Headset w / div
SPMVTM150	150mW Video TX: Torrent 110 FPV	NA	NA	NA
SPMVTM25	25mW Video TX: Torrent 110 FPV (EU)	25mW Video TX: Torrent 110 FPV (EU)	25mW Video TX: Torrent 110 FPV (EU)	25mW Video TX: Torrent 110 FPV (EU)
EFLB8003S30	11.1V 3S 30C 800MAH Li-Po	11,1V 3S 30C 800mAh LiPo	11,1V 3S 30C 800MAH Li-Po	11,1V 3S 30C 800MAH Li-Po
DYNC2025	Prophet Sport Duo 50w x 2AC Battery			
EFLA111	Li-Po Cell Voltage Checker	Li-Po Cell Voltage Checker	Testeur de tension d'éléments Li-Po	Voltmetro verifica batterie LiPo
DYN1405	Li-Po Charge Protection Bag, Large	Dynamite LiPoCharge Protection Bag groß	Sac de charge Li-Po, grand modèle	Sacchetto grande di protezione per carica LiPo
DYN1400	Li-Po Charge Protection Bag, Small	Dynamite LiPoCharge Protection Bag klein	Sac de charge Li-Po, petit modèle	Sacchetto piccolo di protezione per carica LiPo
SPMR6650	DX6e 6CH Transmitter Only	Spektrum DX6e DSMX 6-Kanal-Sender	Emetteur DX6e DSMX 6 voies	DX6e DSMX trasmittente 6 canali
	DX6 DSMX 6-Channel Transmitter	Spektrum DX6 DSMX 6-Kanal-Sender	Emetteur DX6 DSMX 6 voies	DX6 DSMX trasmittente 6 canali
	DX8e DSMX 8-Channel Transmitter	Spektrum DX8e DSMX 8-Kanal-Sender	Emetteur DX8e DSMX 8 voies	DX8e DSMX trasmittente 8 canali
	DX8G2 DSMX 8-Channel Transmitter	Spektrum DX8G2 DSMX 8-Kanal-Sender	Emetteur DX8G2 DSMX 8 voies	DX8G2 DSMX trasmittente 8 canali
	DX9 DSMX 9-Channel Transmitter	Spektrum DX9 DSMX 9-Kanal-Sender	Emetteur DX9 DSMX 9 voies	DX9 DSMX trasmittente 9 canali
	DX18 DSMX 18-Channel Transmitter	Spektrum DX18 DSMX 18-Kanal-Sender	Emetteur DX18 DSMX 18 voies	DX18 DSMX trasmittente 18 canali
	DX20 DSMX 20-Channel Transmitter	Spektrum DX20 DSMX 20-Kanal-Sender	Emetteur DX20 DSMX 20 voies	DX20 DSMX trasmittente 20 canali
	iX12 DSMX 12-Channel Transmitter	Spektrum iX12 DSMX 12-Kanal-Sender	Emetteur iX12 DSMX 12 voies	iX12 DSMX trasmittente 12 canali



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Patents pending

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