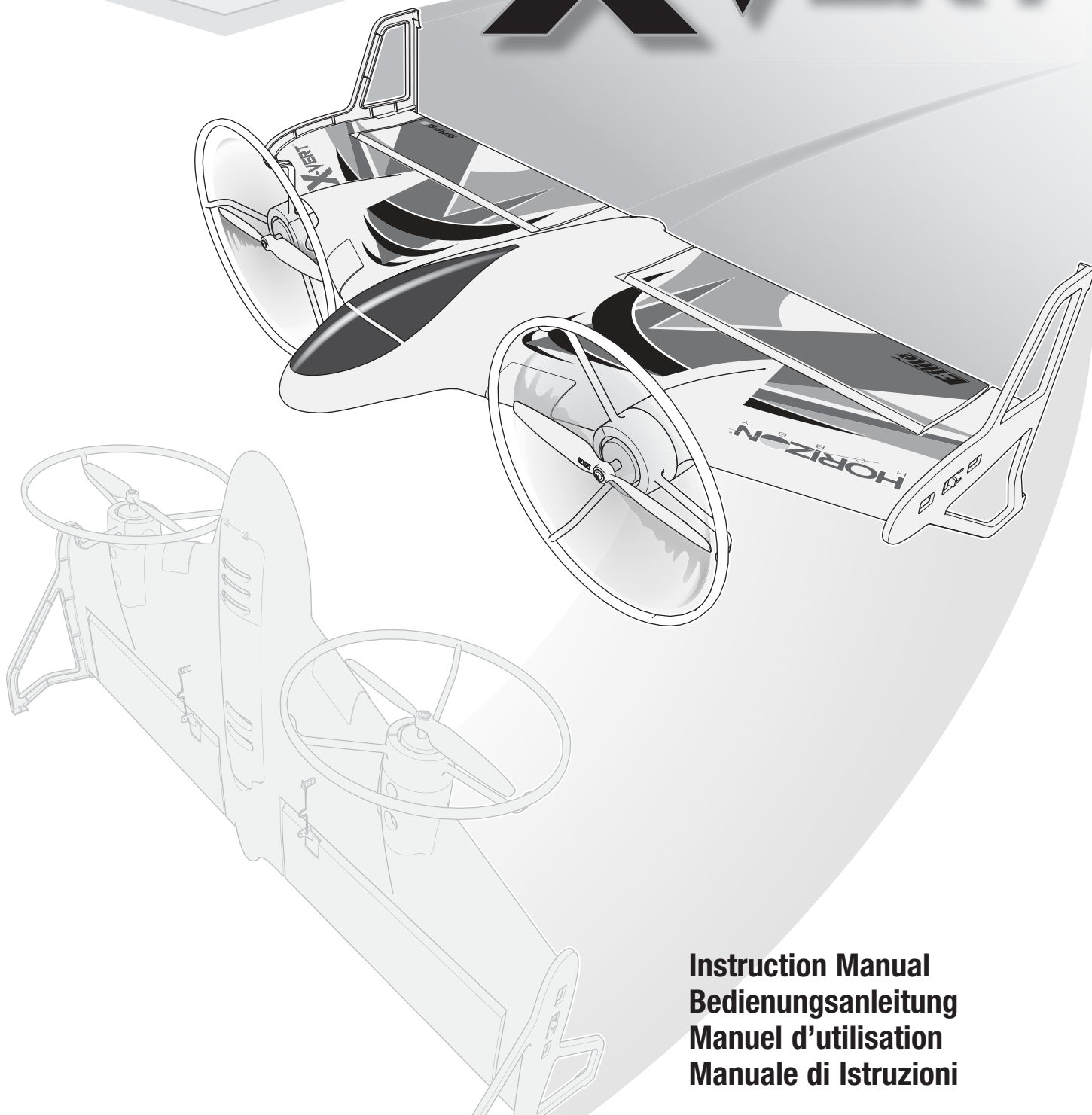


HORIZON
H O B B Y

Eflite
ADVANCING ELECTRIC FLIGHT

X-VERT™



Instruction Manual
Bedienungsanleitung
Manuel d'utilisation
Manuale di Istruzioni

Ready-To-Fly

Bind-N-Fly®
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 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:

NOTICE: Procedures, which if not properly followed, create a possibility of physical property damage AND 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.

14+

AGE RECOMMENDATION:

Not for children under 14 years. This is not a toy.

Safety Precautions and Warnings

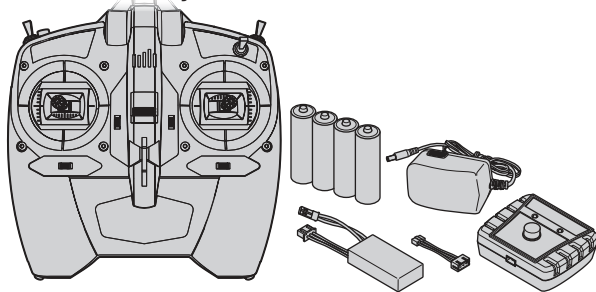
As the user of this product, you are solely responsible for operating in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

- 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

Included with the RTF only



Quick Start Information

Transmitter Setup	Set up your transmitter using the transmitter setup table
Center of Gravity (CG)	126-136mm (measured forward from the trailing edge of the wing)
Flight Timer Setting	4 minutes with the 450mAh flight battery 8 minutes with the 800mAh flight battery

Flight Mode (switch pos)	SAFE®	AS3X®
Multirotor (0)	Yes	No
Stability (1)	Yes	No
Acro (2*)	No	Yes

Multirotor mode should only be used in light to no wind conditions. Hand launching in stability or acro mode is recommended in moderate to windy conditions.

* See the Flight Modes section for information concerning the availability of Acro mode in the RTF version of the X-VERT.

Specifications

		RTF READY-TO-FLY	BNF BASIC
	Motors: (2) 280 Brushless Outrunner 2600Kv (EFLM1809)	Installed	Installed
	Servos: (2) 4 g Servos (SPMSA220)	Installed	Installed
	Receiver/ESC: RX/ESC/Flight Controller (EFLAS1810)	Installed	Installed
	Battery: 2S 7.4V 450-800mAh LiPo	Included	Required
	Battery Charger: 2-cell Li-Po battery balancing charger and power supply (EFLUC1009 and EFLC4002 included with RTF only)	Included	Required
	Transmitter: Full-Range 6 channel 2.4GHz with Spektrum™ DSMX® technology (SPMR1000, Spektrum DXe included with RTF only)	Included	Required

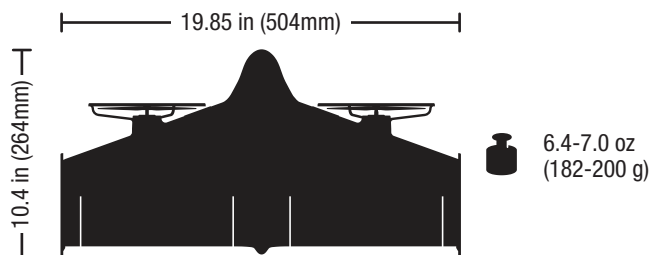
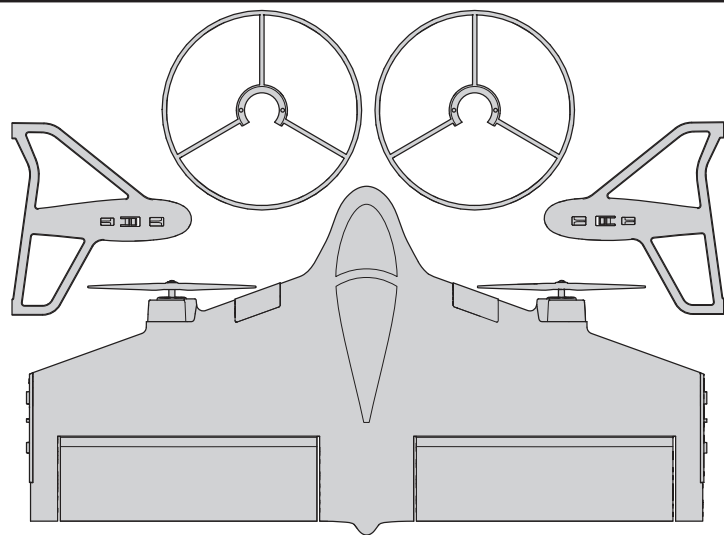


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To receive product updates, special offers and more, register your product at www.e-fliterc.com

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.	

Charging Warnings



CAUTION: All instructions and warnings must be followed exactly. Mishandling of Li-Po batteries can result in a fire, personal injury and/or property damage.

NEVER LEAVE CHARGING BATTERIES UNATTENDED.

NEVER CHARGE BATTERIES OVERNIGHT.

- By handling, charging or using the included Li-Po battery, you assume all risks associated with lithium batteries.
- If at any time the battery begins to balloon or swell, discontinue use immediately. If charging or discharging, discontinue and disconnect. Continuing to use, charge or discharge a battery that is ballooning or swelling can result in fire.
- Always store the battery at room temperature in a dry area for best results.
- Always transport or temporarily store the battery in a temperature range of 40–120° F (5–49° C).
- Do not store battery or model in a car or direct sunlight. If stored in a hot car, the battery can be damaged or even catch fire.

- Always charge batteries away from flammable materials.
- Always inspect the battery before charging.
- Always disconnect the battery after charging, and let the charger cool between charges.
- Always constantly monitor the temperature of the battery pack while charging.
- ONLY USE A CHARGER SPECIFICALLY DESIGNED TO CHARGE LI-PO BATTERIES.** Failure to charge the battery with a compatible charger may cause a fire resulting in personal injury and/or property damage.
- Never discharge Li-Po batteries to below 3V per cell under load.
- Never cover warning labels with hook and loop strips.
- Never charge batteries outside recommended levels.
- Never charge damaged batteries.
- Never attempt to dismantle or alter the charger.
- Never allow minors to charge battery packs.
- Never charge batteries in extremely hot or cold places (recommended between 40–120° F or (5–49° C) or place in direct sunlight.

Battery Charging

NOTICE: Charge only batteries that are cool to the touch and are not damaged. Look at the battery to make sure it is not damaged e.g., swollen, bent, broken or punctured.

- Connect the AC power supply (A) to the charger.
- Connect the other end of the power supply to an appropriate AC power source.
- Connect the battery balance lead to the charger adapter (B).



WARNING: Only connect the battery balance lead to the charger adapter. Never attempt to connect any other type of lead to the charging adapter or charger port.

- Connect the charger adapter to the charger (C).
- Press the Start/Stop Button to begin charging.
- Battery charging is complete when the charger LED is solid green.
- Always disconnect the flight battery from the charger immediately upon completion of charging.

Charging a fully discharged (not over-discharged) 800mAh battery takes approximately 60 minutes.



CAUTION: Only use chargers specifically designed to charge the included Li-Po battery. Failure to do so could result in fire, causing injury or property damage.



CAUTION: Never exceed the recommended charge rate.

LED Indications

Flashing Green LED with power connected but without battery: Standby

Flashing Green LED: Battery connected

Flashing Red LED at varying speeds: Charging

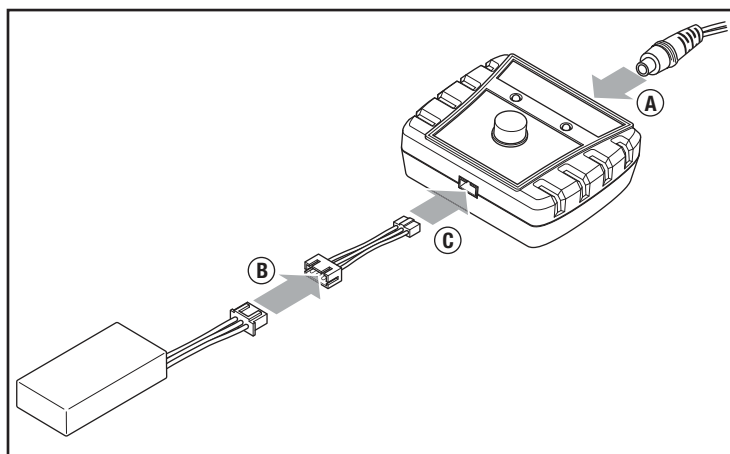
Simultaneously Flashing Red and Green LEDs: Balancing

Solid Green LED: Full Charge

Rapidly Flashing Red and Green LEDs: Error



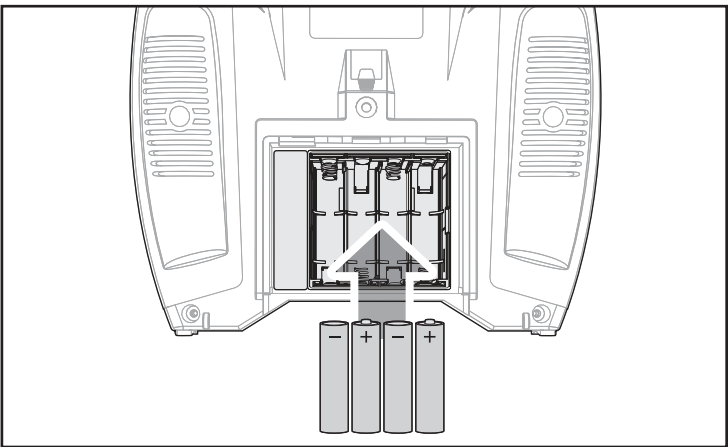
CAUTION: Once charging is complete, immediately remove the battery. Never leave a battery connected to the charger.



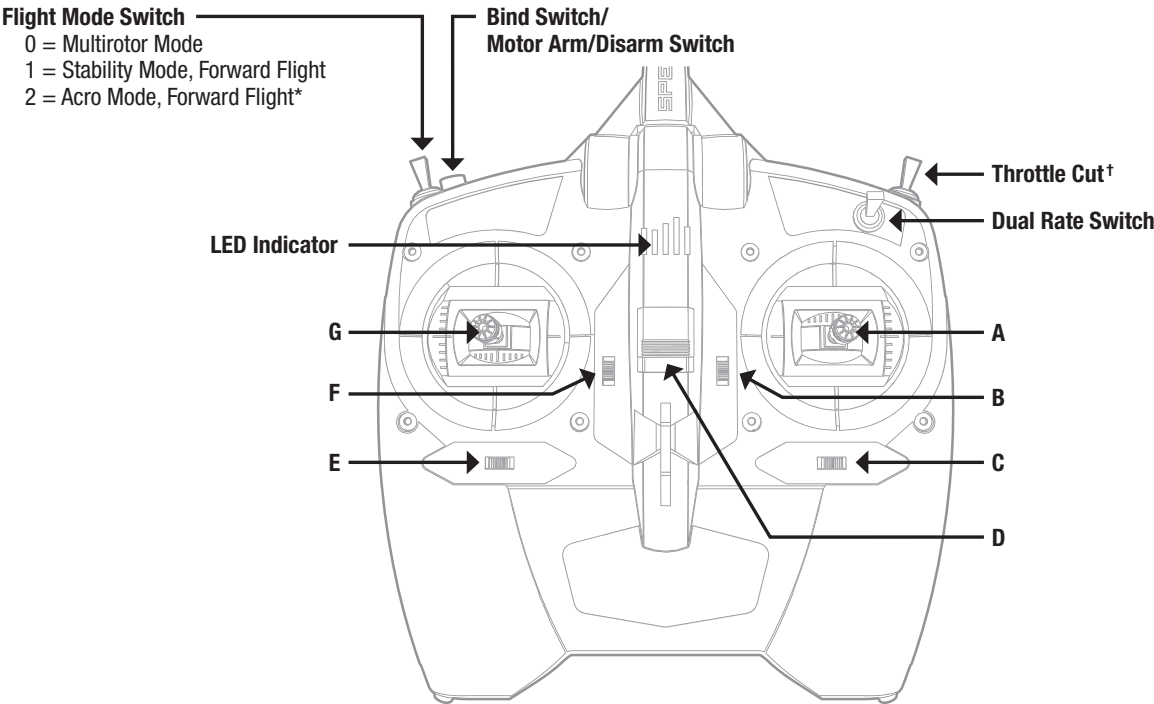
Installing the DXe Transmitter Batteries (RTF)

The LED indicator flashes and the transmitter beeps progressively faster as the battery voltage drops.

Replace the transmitter batteries when the transmitter begins to beep.



DXe Transmitter Control (RTF)



	A	B	C	D	E	F	G
Mode 1	Aileron (Left/Right) Throttle (Up/Down)	Throttle Trim	Aileron Trim	ON/OFF Switch	Rudder Trim	Elevator Trim	Rudder (Left/Right) Elevator (Up/Down)
Mode 2	Aileron (Left/Right) Elevator (Up/Down)	Elevator Trim	Aileron Trim	ON/OFF Switch	Rudder Trim	Throttle Trim	Rudder (Left/Right) Throttle (Up/Down)

* The RTF version of the X-VERT is shipped with only Multirotor and Stability flight modes active. Flight mode switch positions 1 and 2 both access Stability Mode, indicated by the red LED on the flight control board. To access Acro Mode in the RTF version, see the Flight Modes section.

[†] Activating the throttle cut switch while the motors are armed will immediately disarm the motors. You must return the throttle cut switch to the “arm” (0) position and then use the motor arm/disarm switch to re-arm the motors.

BNF Transmitter Setup

The X-VERT™ aircraft requires a transmitter with a minimum of 6 channels with one 3-position switch and one momentary switch available.

Flight Modes are controlled by channel 5 (GEAR).

Motor arming/disarming is controlled by channel 6 (AUX 1).

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

Using the settings shown in the table:

Switch B = Flight Modes

Position 0 = Multirotor Mode

Position 1 = Stability Mode

Position 2 = Acro Mode

Switch I = Motor Arm/Disarm

Switch H = Throttle Cut

Expo

If desired, you may add exponential to soften the feel of the controls around neutral. We recommend starting with 10% on the aileron and elevator channels for Acro Mode only. You may adjust the expo values to better suit your flying style.

Computerized Transmitter Setup

(DXe*, DX6e, DX6, DX7 (Gen2), DX8 (Gen2), DX9, DX18 and DX20)

Start all transmitter programming with a blank ACRO model (perform a model reset), then name the model.

Set DR values to	Hi 100%	Low 70%
Set Throttle Cut to	Active	Switch H
DX6e	1. Go to the SYSTEM SETUP	
DX6 (Gen2)	2. Set MODEL TYPE: AIRPLANE	
DX7 (Gen2)	3. Set AIRCRAFT TYPE:	
DX8 (Gen2)	WING: NORMAL	
DX9	4. Set CHANNEL ASSIGN: (NEXT)	
DX18	CHANNEL INPUT CONFIG: GEAR: B	
DX20	AUX1: I	

* To download the DXe X-Vert setup, visit www.spektrumrc.com.

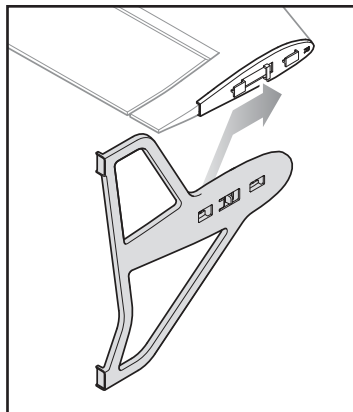
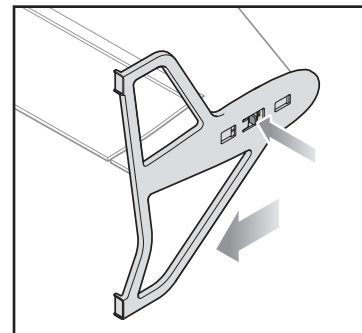
Model Assembly

Install the Wingtip Plates/Landing Gear

The wingtips and tip plates are marked with an "R" and "L". Match the tip plate to the corresponding wingtip.

Slide the tip plates forward over the wingtips until the lock clicks in place.

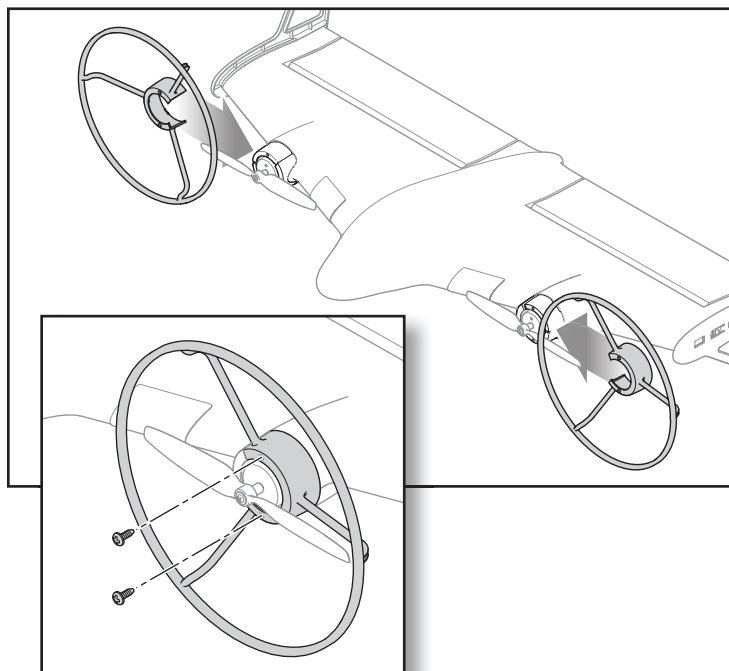
To remove the plates, press the locking tab in and slide the plate to the rear.



Install the Propeller Guards

Install the propeller guards by sliding them around the propellers and over the motor pods as shown, until they snap into place.

Install 2 screws into each guard to secure in place. Do not overtighten the screws as damage to the mounts or guards may result.



Transmitter and Receiver Binding

The transmitter included with the RTF version of this aircraft is pre-bound to the receiver at the factory. If for any reason it becomes necessary to re-bind the transmitter to the receiver, follow the binding procedure in the table. The BNF version of this product requires an approved Spektrum™ DSM2®/DSMX® compatible transmitter. Visit www.bindnfly.com for a complete list of approved transmitters. Follow the binding procedure in the table to bind your transmitter to the aircraft receiver.

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

Binding Procedure

1. Center all trims and move the throttle stick to the lowest position.
2. Power OFF the transmitter.
3. Place the aircraft upright on the wingtip landing gear, on a level surface. Install a fully charged flight battery and connect it to the flight controller. The flight controller will beep once and the green LED will flash to indicate the flight controller is initializing.
4. When the red LED on the flight controller continuously flashes, power ON the transmitter in bind mode. Refer to your transmitter's manual for specific binding instructions.
To enter bind mode in the RTF included DXe transmitter, press and hold the bind button and then power on the transmitter. The LED indicator will flash rapidly to indicate the transmitter is in bind mode. Release the bind button.
5. The receiver is bound to the transmitter when the LED on the receiver glows solid.

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

Battery Installation and ESC Arming

Battery Selection

The RTF version includes a 2S 7.4V 800mAh LiPo battery (EFLB8002SJ30). We recommend a 2S 7.4V 450-800mAh LiPo battery. Refer to the *Optional Parts* list for other recommended batteries.

Installation

1. Lower the throttle and throttle trim to the lowest settings. Power on the transmitter and wait approximately 5 seconds.
2. Open the battery hatch.
3. Apply the loop side (soft side) of the hook and loop tape to the bottom of your battery and the hook side to the battery tray. Use enough hook and loop material to ensure the battery is held securely in place through even the most violent aerobatic maneuvers.

NOTICE: Failure to use adequate hook and loop material may allow the battery to become dislodged or ejected in flight. Movement of the battery in flight may cause a change of the center of gravity and loss of control.

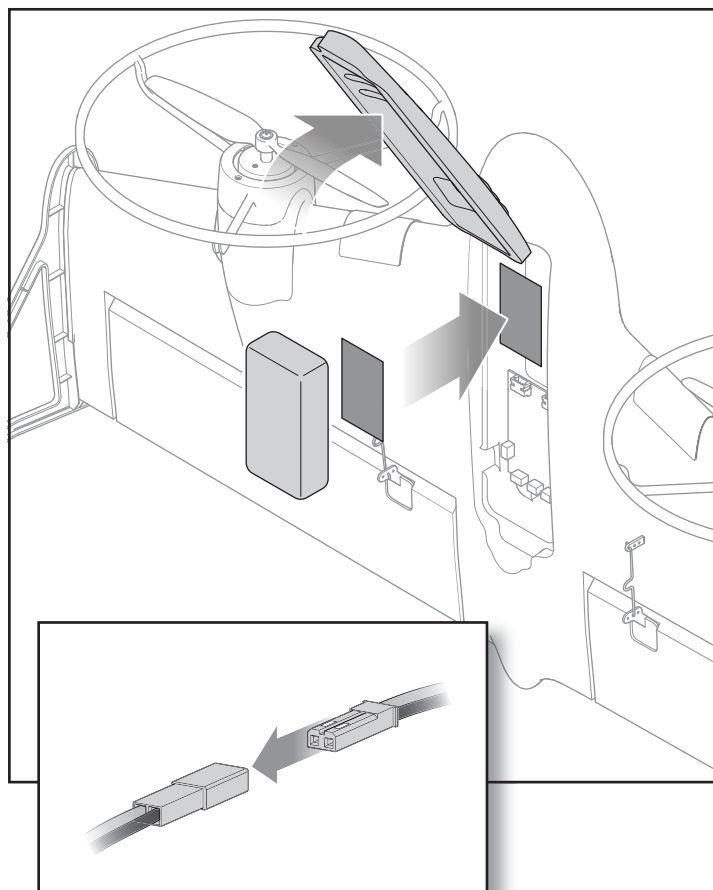
4. Install the fully charged battery centered in the battery compartment.
5. Connect the battery lead to the aircraft power lead, noting correct polarity.

CAUTION: Connecting the battery to the aircraft power lead with reversed polarity will cause damage to the flight controller and the battery. Damage caused by incorrectly connecting the battery is not covered under warranty.

6. The aircraft must be either vertical on the landing gear or horizontal on its back to initialize. Keep the aircraft immobile and away from wind or the flight control system may not initialize.

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

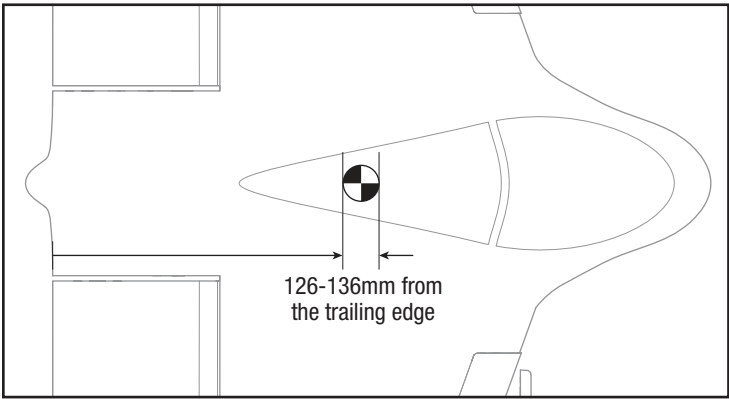
7. Close the battery hatch.
8. Refer to the Center of Gravity section to ensure the model balances at the recommended CG.



Center of Gravity (CG)

The CG location is within 126-136mm (measured forward from the trailing edge of the wing).

CAUTION: Failure to confirm the correct center of gravity may cause a loss of control and a crash. Crash damage is not covered under warranty.



Control Horn and Servo Arm Settings

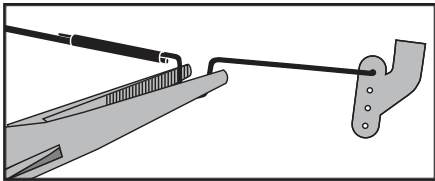
The table at the right shows the factory settings for the elevon control horns and servo arms. Do not make changes to the elevon linkages.

	Control Horns	Servo Arms
Elevons		

Control Centering

Before the first flights, or in the event of an accident, make sure control surfaces are centered when the transmitter controls and trims are neutral. The transmitter sub-trim must be set to zero. Adjust the linkages mechanically if the control surfaces are not centered.

Make the U-shape narrower to make the connector shorter. Make the U-shape wider to make the linkage longer.



Flight Control Direction Tests

Transmitter Input Test

This test ensures that the flight control system is reacting properly to your transmitter inputs. Assemble the aircraft and bind your transmitter to the receiver before performing this test.

CAUTION: Keep all body parts, hair and loose clothing away from the propellers at all times, as these items could become entangled.

Set the transmitter flight mode switch to stability mode (position 1).

Holding the aircraft horizontal at the tail, arm the flight control system by pressing and releasing the arming button on the transmitter. The aircraft surfaces will deflect quickly in either direction and then to center to indicate the control system is now armed. Once the flight control system is active, the control surfaces may move rapidly. This is normal.

Move the transmitter controls as shown in the "Transmitter Input" column of the table. The control surfaces should react to your inputs by moving in the directions shown in the "Control Surface Reaction" column. If any of the control surfaces do not respond in the proper direction, ensure the corresponding transmitter channel is NOT reversed.

Transmitter Input	Control Surface Reaction (viewed from the rear)

Stability System Reaction Test

This test ensures that the flight control system is reacting properly to external forces, such as wind. Assemble the aircraft and bind your transmitter to the receiver before performing this test.



CAUTION: Keep all body parts, hair and loose clothing away from the propellers at all times, as these items could become entangled.

Set the transmitter flight mode switch to stability mode (position 1).

Holding the aircraft horizontal at the tail, arm the flight control system by pressing and releasing the arming button on the transmitter. The aircraft surfaces will deflect quickly in either direction and then to center to indicate the control system is now armed. Once the flight control system is active, the control surfaces may move rapidly. This is normal.

Pivot the entire aircraft as shown in the “Aircraft Movement” column of the table. The control surfaces should react to your movements by moving in the directions shown in the “Control Surface Reaction” column. If the control surfaces do not respond as shown, do not fly the aircraft. Contact Horizon Product Support.

Aircraft Movement	Control Surface Reaction (viewed from the rear)

Flight Modes

Multicopter Mode (switch position 0)

Vertical mode allows the aircraft to take off and land vertically. The flight controls work similar to a quadcopter.

- Receiver LED green
- Limited bank and pitch angle
- Self levelling when the controls are centered

Stability Mode (switch position 1*)

Stability mode allows the novice pilot to get comfortable flying a fixed wing aircraft in forward flight.

- Receiver LED red
- Limited bank and pitch angle
- Self levelling when the controls are centered

Acro Mode (switch position 2*)

Acro mode is intended for experienced pilots who are comfortable flying the aircraft in any orientation.

- Receiver LED green and red
- No bank angle limits
- No self levelling when the controls are centered
- Fully aerobatic capable

* The RTF version is shipped with only multicopter and stability flight modes active. Flight mode switch positions 1 and 2 both access stability mode, indicated by the red LED on the flight control board. You must unlock acro mode using the included DXe transmitter.

Accessing Acro Mode in the RTF X-VERT

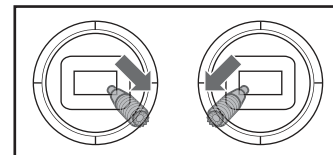


CAUTION: Acro mode is intended only for experienced pilots who have mastered fixed wing aerobatic flight. Attempting to use acro mode without the necessary flight experience may cause loss of control, property damage or a crash. Crash damage is not covered under warranty.

To access acro mode:

1. Power on the transmitter
2. Power on the aircraft, allowing it to initialize fully.
3. Hold the transmitter sticks to the bottom, inside corners and quickly cycle the flight mode switch from position 0 to position 2 and back 3 times.

The control surfaces will cycle multiple times. If successful, the LED on the flight control board will show both green and red LEDs when the flight mode switch is set to acro mode (position 2).



Once accessed, acro mode will be available whenever the aircraft is powered on. It is not necessary to unlock the mode every time the aircraft is powered on.

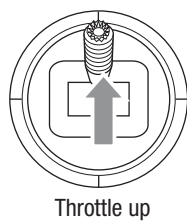
If you wish to lock acro mode again, repeat the directions above until the receiver LED shows stability mode (red LED) in both flight mode switch position 1 and 2.

Understanding the Primary Flight Controls

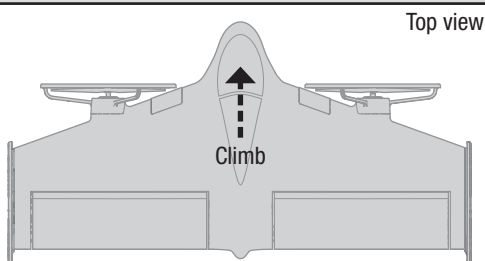
The X-VERT aircraft is capable of both vertical, multirotor-style flight and forward, airplane-style flight. It is important to understand how the primary flight controls function and how the aircraft reacts in both flight modes. Take a few minutes to familiarize yourself with the controls prior to attempting your first flight.

Multirotor Flight Mode

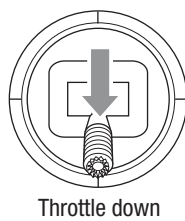
Throttle



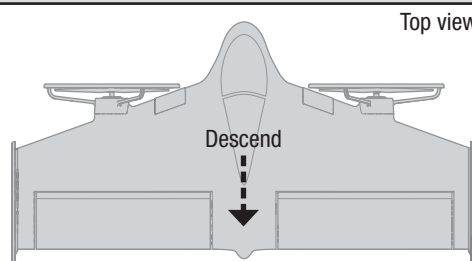
Throttle up



Top view

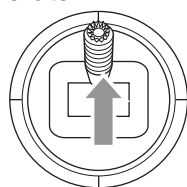


Throttle down

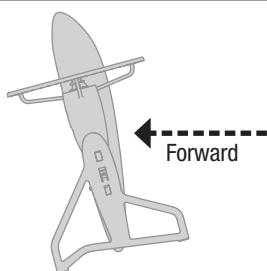


Top view

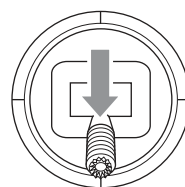
Elevator



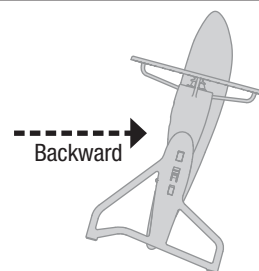
Elevator down



Left side view

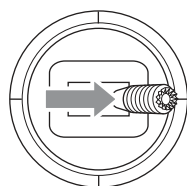


Elevator up

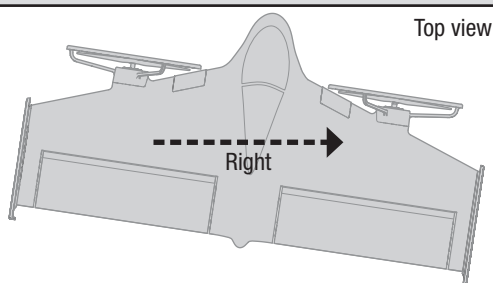


Left side view

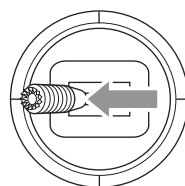
Aileron



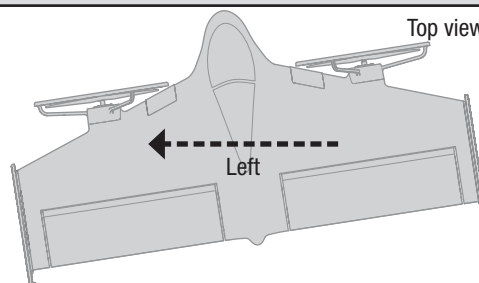
Aileron right



Top view

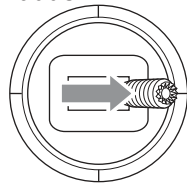


Aileron left

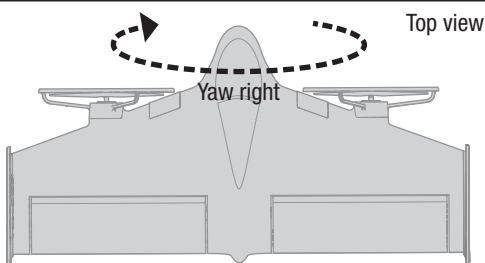


Top view

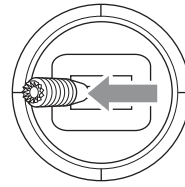
Rudder



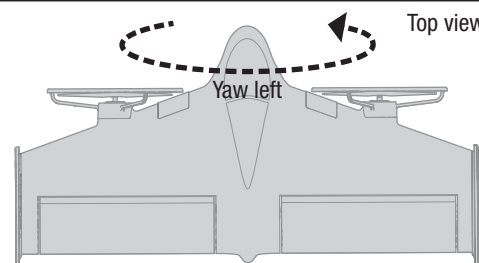
Rudder right



Top view



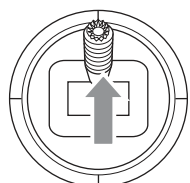
Rudder left



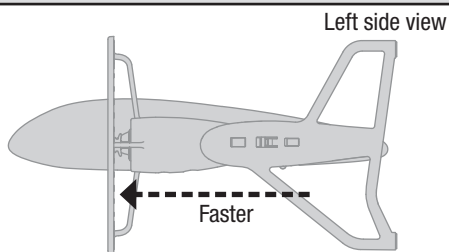
Top view

Stability and Acro Forward Flight Modes

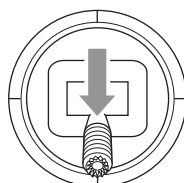
Throttle



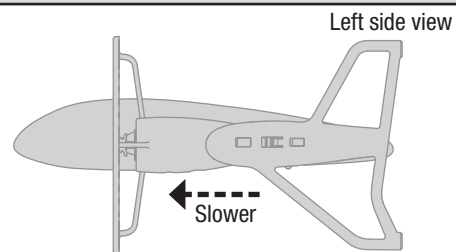
Throttle up



Left side view

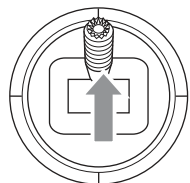


Throttle down

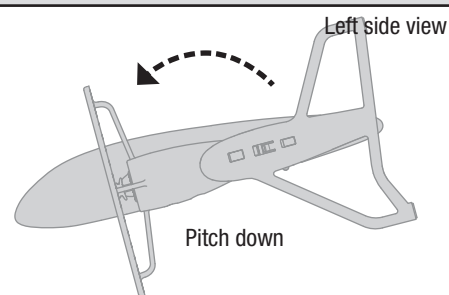


Left side view

Elevator

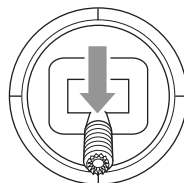


Elevator down

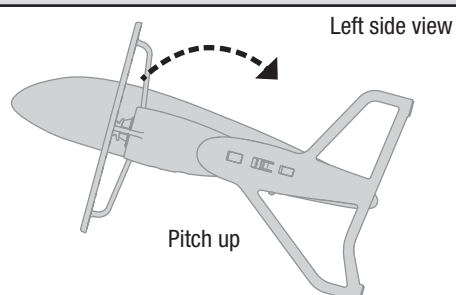


Left side view

Pitch down



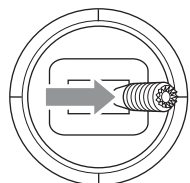
Elevator up



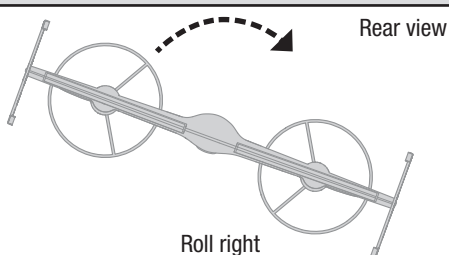
Left side view

Pitch up

Aileron

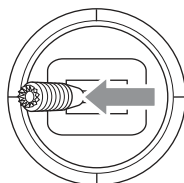


Aileron right

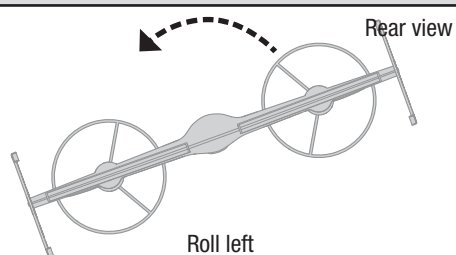


Rear view

Roll right



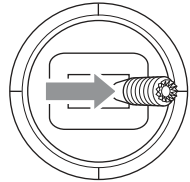
Aileron left



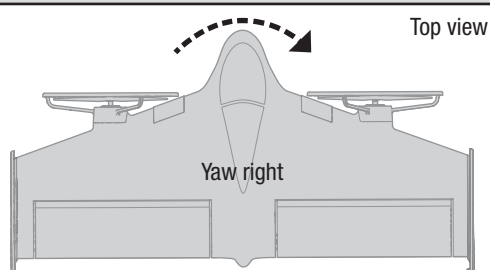
Rear view

Roll left

Rudder

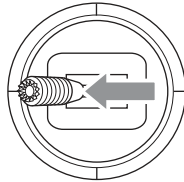


Rudder right

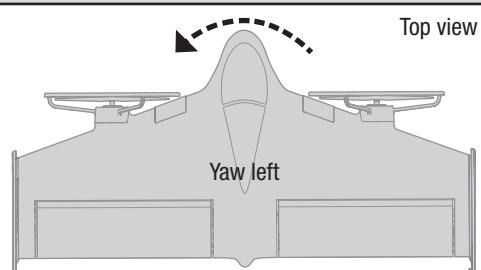


Top view

Yaw right



Rudder left



Top view

Yaw left

Flying Your Aircraft

Consult local laws and ordinances before choosing a flying location.

NOTICE: While the aircraft is capable of forward flight in light to moderate winds, we recommend using multirotor mode only in very light wind or calm conditions. Using multirotor mode or transitioning from forward flight to multirotor mode in windy conditions will cause the aircraft to be blown downwind and could cause a loss of control or a crash. Use only the forward flight modes for flying in windy conditions.

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

The recommended battery is the EFLB8002SJ30 800mAh LiPo. For best results, always use a fresh battery. Due to the increased battery draw of this or any vertical lift aircraft, using an old or worn battery will give far shorter flight times.

For your first flights with the recommended 800mAh battery pack, set your transmitter timer or a stopwatch to 8 minutes.

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

After 8 minutes, land the aircraft. Adjust your timer for longer or shorter flights depending on your preference and battery usage.

Arming

The X-VERT can be armed in any of the three flight modes. The active flight mode during arming determines how the aircraft will indicate it is armed and ready for flight.

Prior to arming, lower the throttle to the lowest setting. The aircraft will not arm unless the throttle is fully lowered.

When the aircraft is armed in multirotor mode, the motors will spin up to idle speed.

When the aircraft is armed in either stability or acro mode, the elevons will cycle and then return to center. The motors will not run until throttle is applied.

IMPORTANT: As a safety feature, arming in one flight mode and changing to another flight mode prior to adding throttle will cause the aircraft to disarm.

Vertical Takeoff

1. Place the aircraft vertically on the landing gear on a flat, level surface with the top facing you. The aircraft must be sitting vertically to arm in multirotor mode.
2. Set the flight mode to multirotor flight.
3. Lower the throttle to the lowest setting. The aircraft will not arm unless the throttle is fully lowered.
4. Arm the aircraft by pressing and holding the motor arm/disarm switch. When the aircraft is armed in multirotor mode the motors will spin up to idle speed.
5. Gradually increase the throttle until the model lifts off and is approximately 2 ft. (600mm) off the ground. Avoid forcing the aircraft into the air.

Hovering and Vertical Flight

Making small corrections on the transmitter, try to hold the aircraft in one spot. 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 should level itself. 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 top pointed towards you at all times to aid with orientation. You can also ascend and descend using the throttle stick.

When comfortable with these maneuvers, attempt flying with the aircraft 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. For example, pushing the elevator stick forward will always pitch the nose toward the bottom of the fuselage, causing the aircraft to move forward and vice versa.

Hovering and multirotor flight is best attempted in low wind conditions.

Attempting to fly in higher winds will cause the aircraft to drift downwind dramatically if the top or bottom are turned into the wind. It is possible to hold position somewhat if the aircraft is turned sideways into the wind, but this is recommended only for more experienced pilots.

Lowering the throttle to descend while flying in multirotor mode in choppy or windy conditions may cause the aircraft to appear “bouncy” or erratic. This is normal as the flight controller reacts to compensate for the moving air.

Transitioning In Flight

To transition to stability, forward flight from multirotor flight, change the flight mode switch on your transmitter to the stability flight mode position. The throttle will increase slightly and the aircraft will pitch forward until forward flight attitude has been achieved. It is normal to have some slight oscillations in pitch as the aircraft transitions into forward flight. While in stability flight mode the motors use differential thrust to provide yaw control.

NOTICE: Always fly in a clear and open area. While the transition from multirotor to forward flight does not require much space, you will not be able to change the direction of flight until the transition is complete. NEVER attempt to transition to forward flight indoors in anything but a large open space such as a large gymnasium.

To transition to multirotor flight from forward flight, reduce the airspeed and change the flight mode switch on your transmitter to the multirotor flight position. The throttle will increase slightly and the aircraft will pitch up until it reaches a multirotor attitude.

NOTICE: If you are flying in wind, the aircraft will be blown downwind after it transitions to vertical mode.

Transition to vertical flight at low throttle will cause the aircraft to descend until more throttle is applied.

Stability and Acro Forward Flight

Fly the aircraft and trim it for level flight per the *In Flight Trimming* section.

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

Hand Launching

Hand launching is preferred when flying in higher winds or when vertical takeoff may not be possible.

1. Lower the throttle to the lowest setting. The aircraft will not arm unless the throttle is fully lowered.
2. Power on the model normally, allowing it to initialize completely.
3. Set the flight mode switch to stability mode.
4. Hold the aircraft horizontal, with a firm grip at the rear-center of the airframe, being careful not to interfere with the control surfaces.
5. Arm the aircraft by pressing and holding the motor arm/disarm switch. When the aircraft is armed in either stability or acro mode, the control surfaces will cycle left and right and then return to center. The aircraft is now armed in stability mode. The motors are armed and will run with any throttle input.
6. Increase the throttle to approximately 50–75%.
7. Give the aircraft a light, underhand toss into the wind.

Landing

The preferred method of landing is to transition the aircraft into multirotor flight mode and bring it into a low hover. Slowly lower the throttle to descend to a soft landing. Immediately activate throttle cut or press and hold the motor arm/disarm switch to stop the motors when the aircraft touches down. Failure to stop the motors may cause the aircraft to skip or hop across the ground if the flight controller does not recognize the aircraft has landed.

It is possible to land the aircraft in forward flight as well when conditions dictate it, such as in high wind. To land while in a forward flight mode, turn the aircraft into the wind and lower the throttle to decrease the forward speed. Fly the aircraft to approximately 6 inches (15cm) or less above the runway, using a small amount of throttle for the entire descent. Keep the throttle on until the aircraft is ready to touch down.

Just before touch down, keep the wings level and the airplane pointed into the wind. Gently lower the throttle while easing back on the elevator to bring the aircraft to touch down on the runway as slowly and gently as possible. Using stability mode for landings will help stabilize the aircraft.

IMPORTANT: The aircraft will automatically disarm after sitting for approximately 3 seconds with no throttle, no control inputs or aircraft movement.

The average flight time with a mixture of multirotor and forward flight using the recommended 800mAh flight battery is approximately 8 minutes.

After landing disconnect and remove the Li-Po battery from the aircraft 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.

NOTICE: If a crash is imminent, activate the throttle cut to immediately stop the motors to reduce the possibility of damage to the airframe and electronic components.

NOTICE: Crash damage is not covered under warranty.

NOTICE: Never leave the aircraft in direct sunlight or in a hot, enclosed area such as a car. Doing so can damage the aircraft.

Propeller Inspection

Inspect the propellers after every flight. Check for breaks, cracks or bends of the propeller tips. Even minor damage may affect the flight performance of the aircraft and may cause unwanted yaw under throttle in forward flight. If any damage is found, replace the propeller before attempting additional flights.

Low Voltage Cutoff (LVC)

When a Li-Po battery is discharged below 3V per cell, it will not hold a charge. The aircraft's ESC protects the flight battery from over-discharge using Low Voltage Cutoff (LVC). Once the battery discharges to approximately 3.45V per cell, the LVC will reduce the power to the motor in order to leave adequate power to the receiver and servos to land the aircraft.

In Flight Trimming

Familiarize yourself with the *Flying Your Aircraft* section prior to trimming your aircraft. Trimming should be done in calm wind conditions and with a fully charged transmitter and flight battery. Trimming should only be necessary in acro mode, as the flight controller will compensate for minor trim issues in multirotor and stability modes. It is important to make any trim adjustments mechanically in the control linkages and re-set the transmitter trims to center to keep any changes made from affecting multirotor and stability modes.

1. Power on and takeoff normally.
2. Change the flight mode to acro and fly straight and level at approximately 3/4 throttle.
3. Trim the aircraft for level flight using the trim buttons on the transmitter.
4. When the aircraft maintains reasonable straight and level flight, land the aircraft.

How the LVC function is indicated is dependent on which flight mode is active. While in vertical mode, the motor power will decrease. The aircraft will respond sluggishly to throttle and will gradually not be able to gain or hold altitude. When the motor power decreases, land the aircraft immediately and replace or recharge the flight battery.

While in either of the forward flight modes, the motors will cut off briefly and power back on. If the motors cut off or surge in power, land immediately and replace or recharge the flight battery. Transition back to vertical mode is possible if done early in the LVC

NOTICE: Repeated flying to LVC may damage the flight battery.

LVC does not prevent the battery from over-discharge during storage.

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

5. Set the flight mode back to acro mode if it was changed for landing. Power cycle the aircraft. Do not activate the throttle. Take note of the neutral position of the control surfaces.
6. Adjust the control linkages mechanically, as shown in the "Control Centering" section, to compensate for the amount of trim entered.
7. Re-center the trims on the transmitter. **The transmitter trims should always be centered for best flight performance.**
8. Fly the aircraft again to check the changes made.
9. Repeat the trimming process until the aircraft will maintain reasonable straight and level forward flight without excessive control corrections.

When the initial trimming process is done, the aircraft should not require large amounts of trimming on subsequent flights. If large amounts of trim are needed to hold straight and level on later flights, land the aircraft and check the control surfaces for damage or binding.

Post Flight

1. Disconnect the flight battery from the flight controller
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

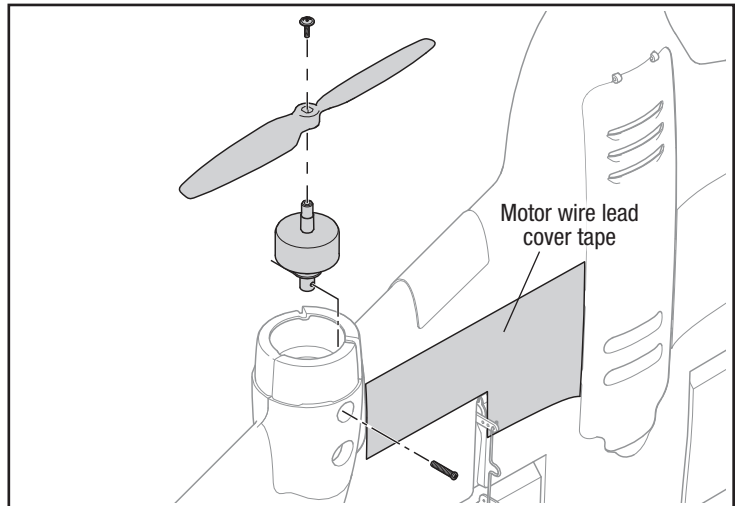
CAUTION: Always disconnect the flight battery before performing motor service.

Motor Removal

1. Disconnect the motor lead from the flight control board.
2. Remove the propeller retention screw and propeller from the motor shaft.
3. Looking through the hole in the bottom of the motor nacelle, remove the setscrew from the motor mount.
4. Very carefully remove the tape covering the motor wire lead.
5. Pull the motor from the motor mount, feeding the motor wire lead through the nacelle.

Assemble in reverse order.

Note: The illustration shows the propeller guard removed for clarity. It is not necessary to remove the guards to replace the motors.



FPV System Installation (Optional)

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

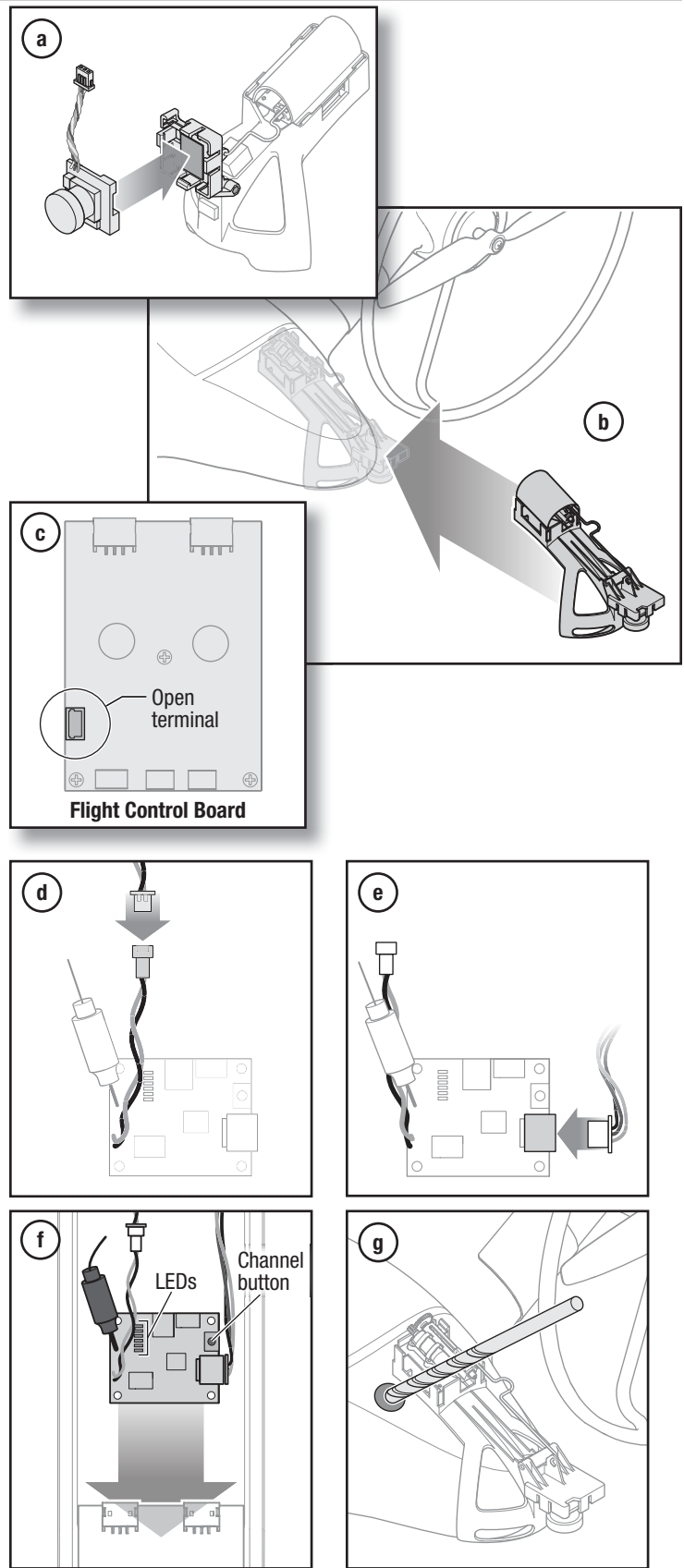
Consult local laws and ordinances before operating FPV equipment. In some areas, FPV operation may be limited or prohibited. You are responsible for operating this product in a legal and responsible manner.

Items required for FPV installation and operation:

- FPV Camera Mount with Servo (EFL1812)
- FPV Camera (SPMVC01)
- 150mW Video Transmitter (SPMVTM150) *North America only*
- 25mW Video Transmitter (SPMVTM025) *European Union only*
- Spektrum™ 4.3 inch Video Monitor with Headset (SPMVM430C) or suitable headset or ground station

Installing the Optional FPV System

1. Remove the flight battery from the aircraft.
2. Install the camera to the camera mount with double sided tape. The camera should be installed so the wiring harness is at the top left side of the mount as shown (a).
3. Peel the backing from the double stick tape of the FPV mount.
4. Attach the mount to the nose of the aircraft as shown (b), making sure the mount is centered and level to the aircraft.
5. Connect the 4 pin/ 3-wire connector of the y-harness to the open terminal (c) on the flight control board.
6. Connect the 2-wire power connector of the y-harness to the video transmitter power lead (d).
7. Connect the 3-wire extension to the terminal on the video transmitter (e).
8. Apply double-sided tape to the bottom of the video transmitter and slide it under the flight control board as shown (f). It should slide in far enough that about half of the transmitter is under the flight control board and the channel button and LEDs are still visible. Do not force the transmitter any farther.
9. Determine whether you wish to route the wire leads internally or externally around the fuselage and into the battery hatch. If routing the wires internally, carefully drill a hole through the fuselage as shown (g), large enough to accommodate the servo and camera connectors, from the nose of the aircraft into the battery compartment.
10. Route the servo end of the y-harness and the camera extension from the battery compartment to the FPV mount.
11. Connect the servo lead to the y-harness connector.
12. Connect the camera lead to the 3-wire extension. Leave enough slack in the wire extension at the nose so the camera mount can pivot through its full range of travel without binding.



Operating the FPV Mount

The FPV camera mount does not require any programming or additional channels in the transmitter. All functions are controlled by the flight control board on the aircraft. Changing between the flight modes with the flight mode switch moves the camera to one of two preset positions.

- While in multirotor mode the camera faces toward the bottom of the aircraft. This allows for a forward view while flying in multirotor mode.
- While in either of the forward flight modes, stability or acro, the camera faces toward the front of the aircraft.

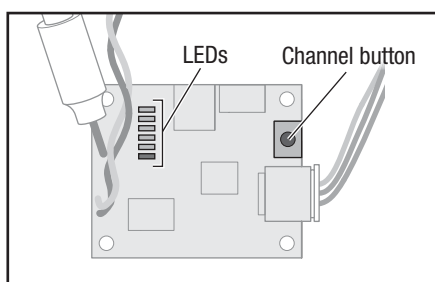
The angle of the camera can be adjusted slightly for your preferred optimal viewing angle by adjusting the length of the control rod on the camera mount. Refer to the Control Centering section for a description of how to adjust the length of the control rod. Ensure any adjustments made to the camera control rod do not cause binding in either the multirotor or forward flight mode camera positions.

NOTICE: Never try to move the mount up or down by hand. Damage to the mount servo may result.

Operating the Video Transmitter

Consult local laws and ordinances before operating FPV equipment. In some areas, FPV operation may be limited or prohibited. You are responsible for operating this product in a legal and responsible manner.

See the Available Frequency table to find the desired video channel and band. The video transmitter channel and band are changed using the button on the video transmitter, as shown. There are 6 LEDs on the video transmitter board. The red LED is the channel indicator. The next 5 blue LEDs are the band indicators.



Channel Selection:

1. Channel 1 is indicated by the red LED glowing solid.
2. Press the button to cycle through the channels (1-8). The red LED will flash once as you cycle through each channel. Press the button once for each channel until the desired channel is reached. If unsure of the current transmitter channel, press the button to cycle the channels until you reach channel 1, indicated by a solid red LED, then cycle to the channel desired.

Band Selection:

1. Press and hold the button to change the video transmitter band.
2. Each time the button is pressed and held, the blue band LED will indicate a change to the next available band. The blue LEDs indicate FS/IRC band, band E (North America only), band A, race band and band B, as shown in the illustration.

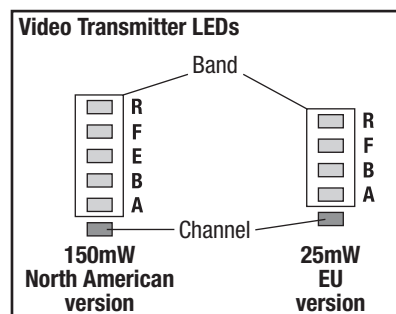
NOTICE: Due to the additional current draw of the camera, servo and video transmitter on the aircraft electrical system, using the optional FPV system will shorten the expected flight times.

Available Frequencies, North America (mHz)

Band	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 7	CH 8
Band A	5865	5845	5825	5805	5785	5765	5745	5725
Band B	5733	5752	5771	5790	5809	5828	5847	5866
Band E	5705	5685	5665	5665	5885	5905	5905	5905
FS/IRC	5740	5760	5780	5800	5820	5840	5860	5880
RaceBand	5658	5695	5732	5769	5806	5843	5880	5917

Available Frequencies, European Union (mHz)

Band	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 7	CH 8
Band A	5865	5845	5825	5805	5785	5765	5745	5745
Band B	5733	5752	5771	5790	5809	5828	5847	5866
FS/IRC	5740	5760	5780	5800	5820	5840	5860	5860
RaceBand	5732	5732	5732	5769	5806	5843	5843	5843



Troubleshooting Guide

Problem	Possible Cause	Solution
Aircraft will not arm	Throttle cut switch in the disarm position (position 1)	Set the throttle cut switch to the arm position (position 0)
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 and spinner, collet or motor	Replace damaged parts
	Propeller is out of balance	Balance or replace propeller
	Prop bolt is loose	Tighten the prop bolt
Reduced flight time or aircraft underpowered	Flight battery charge is low	Completely recharge flight battery
	Flight battery damaged or old	Replace flight battery with a fresh battery and follow flight battery instructions
	Flight conditions 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
	Servo 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 aircraft 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
Controls reversed	Transmitter settings are reversed	Perform the Control Direction Test and adjust the controls on transmitter appropriately
Oscillation	Damaged propeller	Replace propeller
	Imbalanced propeller	Balance the propeller
	Motor vibration	Replace parts or correctly align all parts and tighten fasteners as needed
	Loose battery	Use more hook and loop material to secure the battery
	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 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	Remove all sub-trim. Adjust the servo linkage for proper alignment of surfaces
	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 motor surges while in forward flight modes	Low battery. Low Voltage Cutoff is being triggered.	Recharge flight battery or replace battery that is no longer performing
Aircraft does not maintain or gain altitude in vertical 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	Propellers installed incorrectly	Install the propellers with the "R" propeller on the right side motor and the "L" propeller on the left side motor
Aircraft is unstable in yaw or yaws to one side under throttle in forward flight	Damaged propeller	Inspect the propellers and replace any damaged parts

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/	4105 Fieldstone Rd 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	Hanskampring 9 D 22885 Barsbüttel, Germany
	Sales: Horizon Hobby GmbH	+49 (0) 4121 2655 100	

FCC Information

FCC ID: BRWEFLAS1810

BRWDXE (included in EFL1800 only)

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.

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: 6157A-EFLAS1810

6157A-DXE (included in EFL1800 only)

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



X-VERT RTF (EFL1800)

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 Directive.

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

X-VERT BNF (EFL1850)

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 Directive.

Instructions for disposal of WEEE by users in the European Union



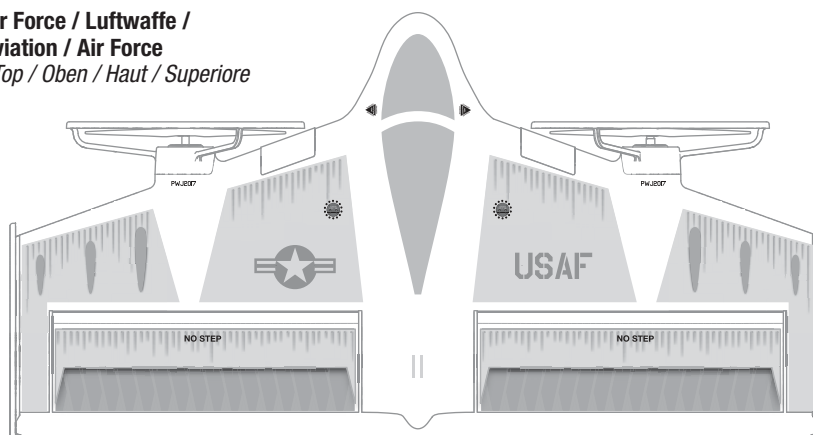
This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collections point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste 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.

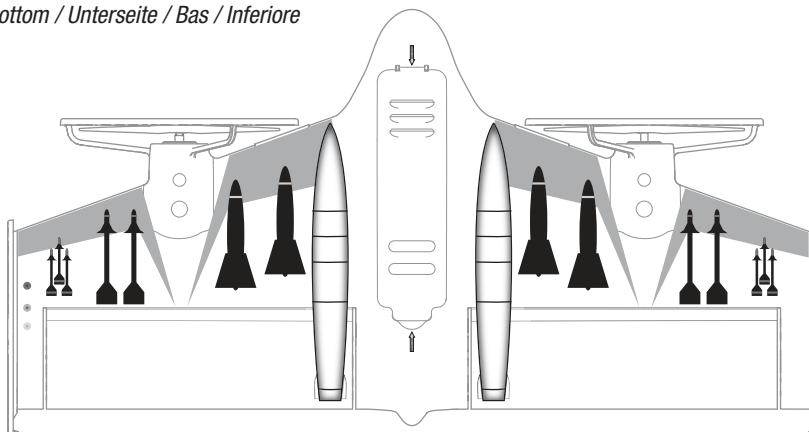


Decal Placement Options / Aufkleber Optionen / Options de décalcomanie / Opzioni decalcomanie

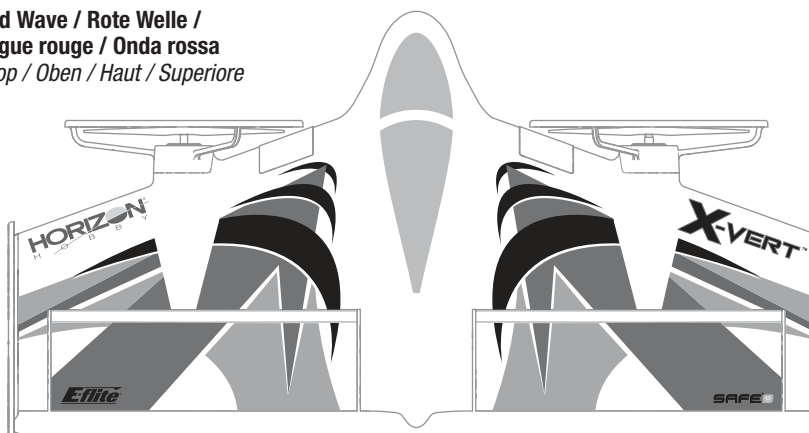
**Air Force / Luftwaffe /
Aviation / Air Force**
Top / Oben / Haut / Superiore



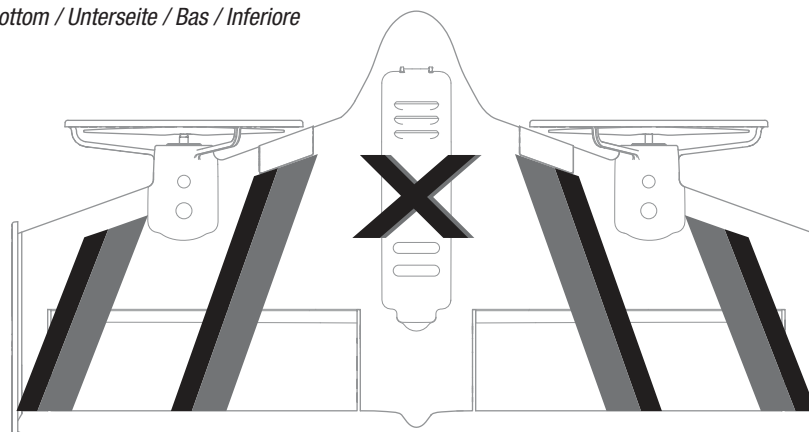
Bottom / Unterseite / Bas / Inferiore



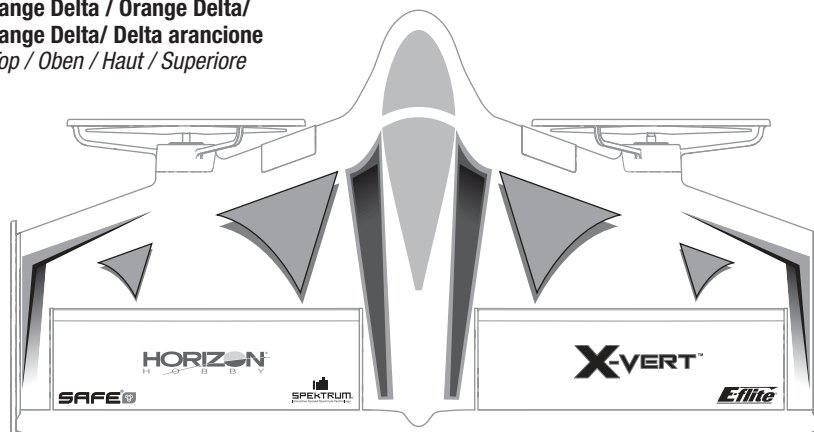
**Red Wave / Rote Welle /
Vague rouge / Onda rossa**
Top / Oben / Haut / Superiore



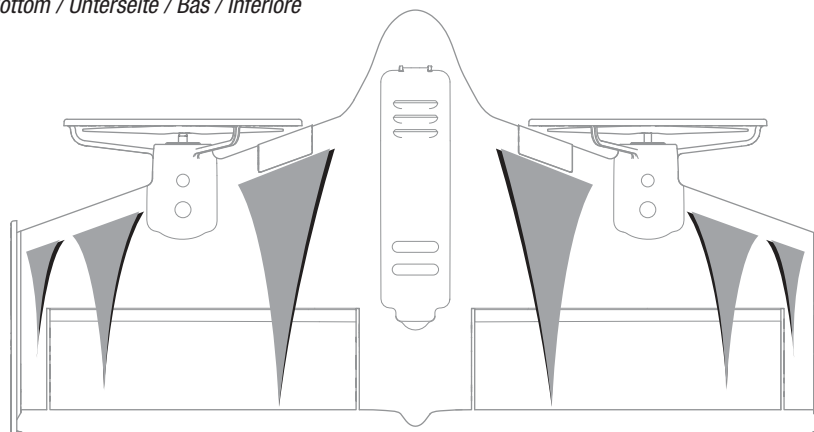
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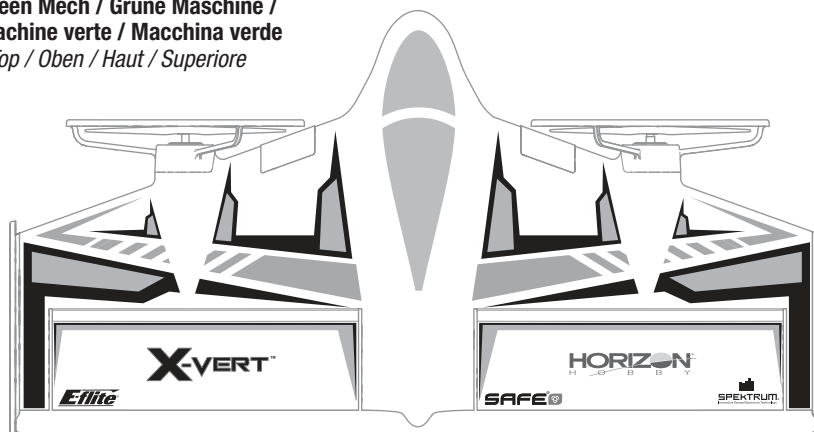
**Orange Delta / Orange Delta/
Orange Delta/ Delta arancione**
Top / Oben / Haut / Superiore



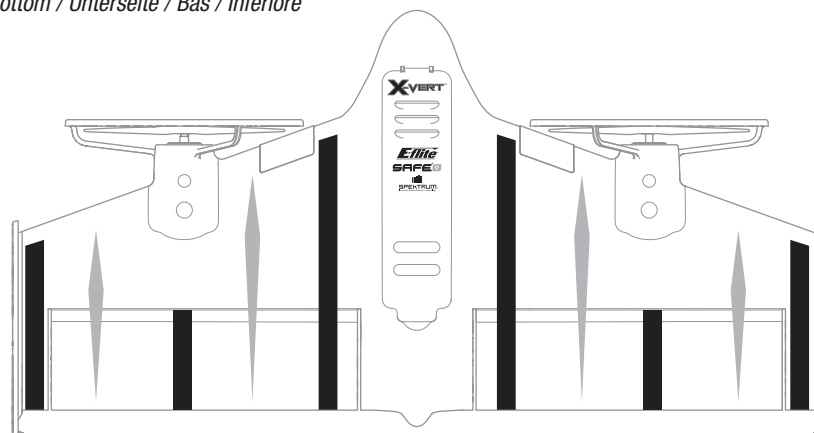
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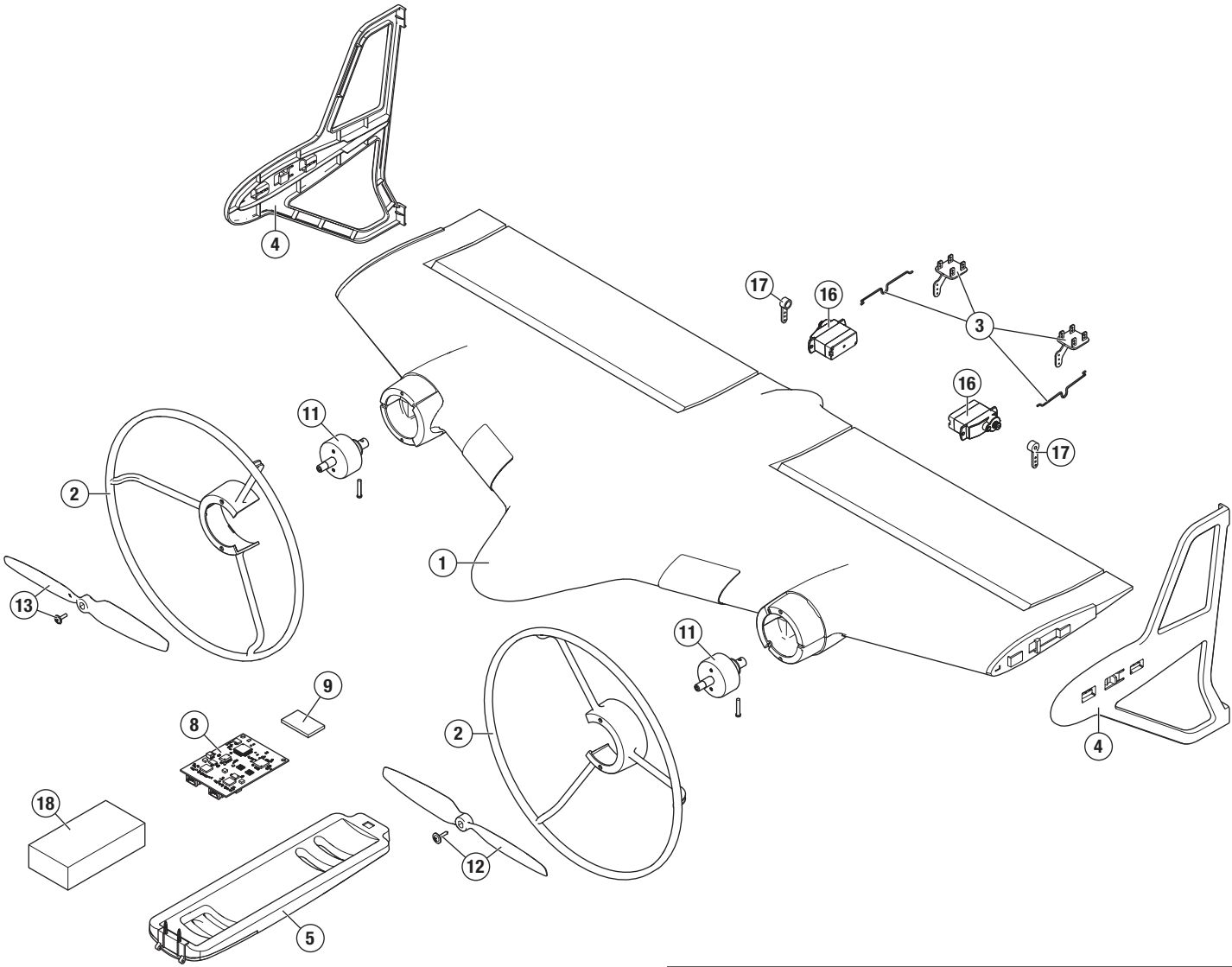


**Green Mech / Grüne Maschine /
Machine verte / Macchina verde**
Top / Oben / Haut / Superiore

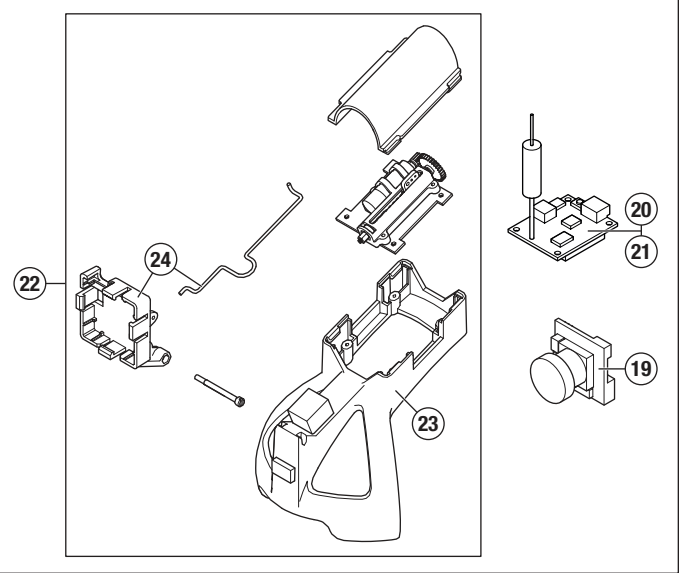


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Optional FPV Equipment / Optionale FPV-Ausrüstung /
Équipement FPV optionnel / Equipaggiamento opzionale FPV



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

Part # / Nummer Numéro / Codice	Description	Beschreibung	Description	Descrizione
1 EFL1801	Replacement Airframe	Ersatzrahmen	Structure de vol de rechange	Cellula sostitutiva
2 EFL1802	Prop Guards L&R	Propellerabdeckungen links und rechts	Protections d'hélices G&D	Protezioni eliche dx/sx
3 EFL1803	Pushrods & Control Horns	Schubstangen und Ruderhörner	Tiges de poussée & renvois de commandes	Aste e squadrette di comando
4 EFL1805	Wing Tip/Landing Gear L&R	Flügelspitze/Fahrgestell links und rechts	Extrémité de l'aile/train d'atterrissage G&D	Wingtip/carrello d'atterraggio dx/sx
5 EFL1806	Battery Hatch w/Mount	Akkufach mit Halterung	Trappe de batterie avec support	Vano batteria con supporto
6 EFL1807	Decal Trim Sheet Set	Trimmblatt-Aufklebersatz	Ensemble autocollant	Set decalcomanie
7 EFL1808	Servo Lead Cover Tape	Servokabel-Abdeckklebeband	Bande de recouvrement du câble du servo	Nastro di copertura cavi servocomandi
8 EFLAS1810	RX/ESC/Flight Controller	Empfänger/Geschwindigkeitsregler/Flugsteuerung	RX/ESC/Contrôleur de vol	Ricevente/ESC/flight controller
9 EFLAS1811	Sensor Board Flight Controller	Sensorplatine der Flugsteuerung	Carte-capteur de commandes de vol	Flight controller con sensori
10 EFLC4002	AC to 12V DC, 1.2-amp-power supply	Stromversorgung, AC auf 12 V DC, 1,2 A	Alimentation de 1,2 ampère AC/DC 12 V	Alimentatore AC a DC 12 V 1,2 A
11 EFLM1809	BL280 Brushless Outrunner Motor, 2600K	BL280 bürstenloser Außenläufer-Motor, 2600 kV	Moteur à cage tournante sans balais BL280, 2600K	Motore outrunner brushless BL280, 2600 Kv
12 EFLP12575L	125 x 75mm Prop Left (2)	Propeller links, 125 x 75 mm (2)	Hélice gauche 125 x 75 mm (2)	Elica sinistra 125 x 75 mm (2)
13 EFLP12575R	125 x 75mm Prop Right (2)	Propeller rechts, 125 x 75 mm (2)	Hélice droite 125 x 75 mm (2)	Elica destra 125 x 75 mm (2)
14 EFLUC1009	Celectra 2S 7.4V DC Li-Po Charger	Celectra 2S 7,4 V DC Li-Po-Ladegerät	Chargeur Li-Po Celectra 2S 7,4 V DC	Caricabatteria DC Celectra 2S 7,4 V per batterie LiPo
15 SPMR1000	DXe Transmitter Only (RTF only)	Nur DXe-Sender (nur RTF)	Émetteur DXe uniquement (RTF uniquement)	Solo trasmittente DXe (solo RTF)
16 SPMSA220	4 Gram Servo	4 Gramm Servo	Servo 4 gammes	Servo 4 g
17 SPMSA2201	Servo Arms (2) for SPMSA220	Servoarme (2) für SPMSA220	Bras de servo (2) pour SPMSA220	Squadrette servo (2) per SPMSA220
18 EFLB8002SJ30	800mAh 2S 7.4V 30C LiPo, 18AWG JST	800 mAh/2S/7,4 V/30C/LiPo-Akku, 18AWG JST	800 mAh 2S 7,4 V 30C LiPo, 18AWG JST	Batteria LiPo 18AWG JST 30C 7,4 V 2S 800 mAh

Optional Parts / Optionale Bauteile / Pièces optionnelles / Pezzi opzionali

Part # / Nummer Numéro / Codice	Description	Beschreibung	Description	Descrizione
19 SPMVCM01	FPV Camera	FPV-Kamera	Caméra FPV	Videocamera FPV
20 SPMVTM150	150mW Video Transmitter	150 mW Videosender	Émetteur vidéo 150mW	Trasmittitore video 150 mW
21 SPMVTM025	25mW Video Transmitter	25mW Videosender	Émetteur vidéo 25mW	Trasmittitore video 25 mW
22 EFL1812	FPV Camera Mount with Servo	FPV-Kamerahalterung mit Servo	Support caméra FPV avec servo	Supporto videocamera FPV con servo
23 EFL1813	FPV Camera Mount	FPV-Kamerahalterung	Support caméra FPV	Supporto videocamera FPV
24 EFL1815	FPV Replacement Camera Mounting Plate	FPV-Ersatzplatte für Kamerahalterung	Plaque de fixation pour caméra de remplacement FPV	Piastra di fissaggio sostitutiva per videocamera FPV
EFL1814	FPV Camera Y-Harness & Extension	FPV-Kamerakabelbaum und -verlängerungskabel	Faisceau de câbles en Y et extension de caméra FPV	Cavo a Y e prolunga per videocamera FPV
EFLB4502SJ30	450mAh 2S 7.4V 30C LiPo, 18AWG JST	450 mAh/2S/7,4 V/30C/LiPo-Akku, 18AWG JST	450 mAh 2S 7,4 V 30C LiPo, 18AWG JST	Batteria LiPo 18AWG JST 30C 7,4 V 2S 450 mAh
SPMVM430C	Spektrum 4.3 inch Video Monitor with Headset	Spektrum 4,3 Zoll Videomonitor mit Headset	Moniteur vidéo Spektrum 4,3" avec lunettes	Display Spektrum 4,3" con visore
DYNC2010CA	Prophet Sport Plus 50W AC/DC Charger	Prophet Sport Plus 50 W Wechsel-/Gleichstrom-Ladegerät	Chargeur 50 W AC/DC Prophet Sport Plus	Caricabatteria AC/DC Prophet Sport Plus 50 W
DYNC2025	Prophet Sport Duo 50W x 2 AC Battery Charger	Dynamite Prophet Sport Duo 50W x 2 AC Ladegerät, EU	Chargeur Prophet Sport Duo 50W x 2 AC	Caricabatterie Prophet Sport Duo 50W x 2 AC
EFLA230	Charger Lead with JST Female	Ladekabel mit weiblichem JST-Anschluss	Fil de chargeur avec JST femelle	Cavo per ricarica con connettore JST femmina
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
	DXe DSMX 6-Channel Transmitter	Spektrum DXe DSMX 6-Kanal-Sender	Émetteur DXe DSMX 6 voies	DXe DSMX trasmittente 6 canali
	DX6e DSMX 6-Channel Transmitter	Spektrum DX6e DSMX 6-Kanal-Sender	Émetteur DXe DSMX 6 voies	DX6e DSMX trasmittente 6 canali
	DX6G2 DSMX 6-Channel Transmitter	Spektrum DX6 DSMX 6-Kanal-Sender	Émetteur DX6 DSMX 6 voies	DX6 DSMX trasmittente 6 canali
	DX7G2 DSMX 7-Channel Transmitter	Spektrum DX7 DSMX 7-Kanal-Sender	Émetteur DX7 DSMX 7 voies	DX7 DSMX trasmittente 7 canali
	DX8G2 DSMX 8-Channel Transmitter	Spektrum DX8G2 DSMX 8-Kanal-Sender	Émetteur DX8G2 DSMX 8 voies	DX8G2 DSMX trasmittente 8 canali
	DX9 DSMX 9-Channel Transmitter	Spektrum DX9 DSMX 9-Kanal-Sender	Émetteur DX9 DSMX 9 voies	DX9 DSMX trasmittente 9 canali
	DX18 DSMX 18-Channel Transmitter	Spektrum DX18 DSMX 18-Kanal-Sender	Émetteur DX18 DSMX 18 voies	DX18 DSMX trasmittente 18 canali
	DX20 DSMX 20-Channel Transmitter	Spektrum DX20 DSMX 20-Kanal-Sender	Émetteur DX20 DSMX 20 voies	DX20 DSMX trasmittente 20 canali

E-flite[®]
ADVANCING ELECTRIC FLIGHT

X-VERT[™]

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US 8,672,726. D774,933. Other patents pending.

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