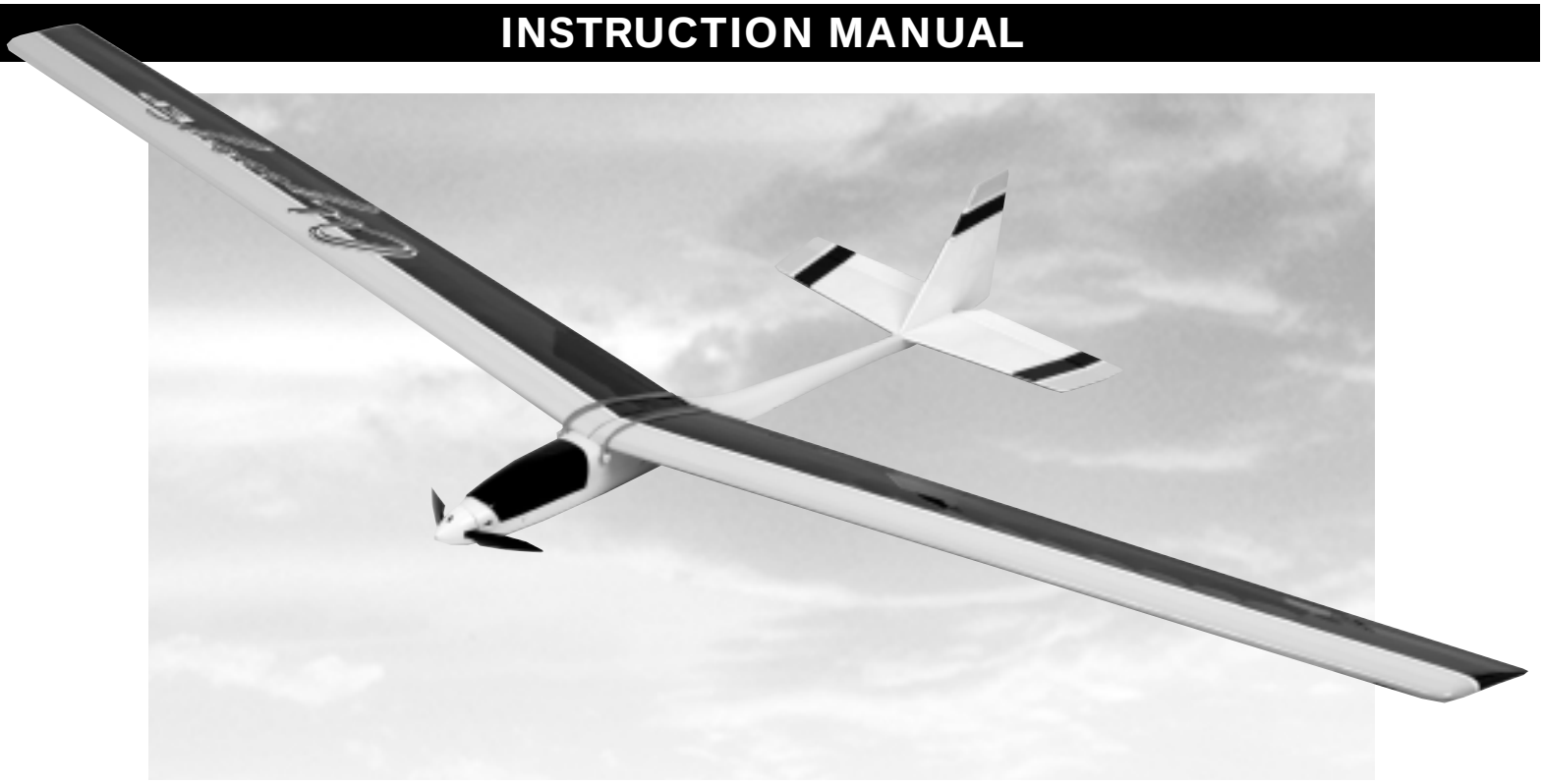
E-flite™

Odyssey™ EP

INSTRUCTION MANUAL



- 90% ARF almost ready-to-fly
- Precovered with Solarfilm™
- All hardware included
- Prewired switch harness and motor installed

90% PREBUILT ARF
ALMOST READY-TO-FLY

Specifications:

- Wingspan: ..... 87 in (220 cm)
- Overall Length: ..... 41 in (104 cm)
- Wing Area: ..... 566 sq in (36.5 dm sq)
- Weight (Approx.) (with 6-cell battery pack): ..... 52-55 oz (1473-1550 g)

Table of Contents

Introduction

E-Flight's Odyssey™ EP offers the modeler an ARF (almost ready-to-fly) electric-powered sailplane that is prebuilt to a high level of craftsmanship. It is unique in that it comes with the electric motor installed, complete with preassembled wiring harness saveing a significant amount of construction time. The precovered and trimmed Odyssey EP is a high-quality 2-meter sailplane that can be flight ready in an hour.

The world of electric-powered sailplanes is extremely challenging and rewarding. It is your skill and knowledge of the surrounding atmosphere combined with the design capabilities of your model that will result in your ability to defy the laws of gravity and produce flights of unbelievable distance and duration. With the electric motor, you can climb to 300-500 feet (thermal hunting altitude) several times, resulting in flight times of up to an hour or more as you soar from thermal to thermal. Flight times are limited only by the capacity of the receiver, transmitter batteries, and your endurance.

WARNING

An R/C aircraft is not a toy! If misused, it can cause serious bodily harm and damage to property. Fly only in open areas, preferably AMA (Academy of Model Aeronautics) approved flying sites, following all instructions included with your radio. Always assume the electric motor can come on at any time so use extreme caution.

Caution

When launching the Odyssey EP, be sure you do not launch near power lines. You should find a large open area to fly your model in. Be especially careful not to get near the propeller of the aircraft until you have disconnected the battery or disengaged the safety switches.

Preassembly

We strongly suggest that before you begin assembly you read through this instruction manual so you can become familiar with the parts and the assembly sequence. Please assemble the kit according to the sequence provided in the instruction manual. Do not attempt to modify or change the kit design as doing so could adversely change the flying characteristics.

Seek Expert Assistance

If you are new to R/C, we suggest you find an experience pilot to check out your aircraft and help you with the first few flights. This will help prevent damage to your model and will speed up the learning process. You can contact local R/C clubs or your dealer to obtain the names of experienced R/C pilots who would be willing to help you with your first few flights.

Note: Due to changes in weather, wrinkling of the covering may occur. This is the nature of the covering film of the model and can be easily eliminated using a heat gun or sealing iron. In case of wrinkle, use a heat gun or sealing iron on the wrinkled area. Then rub the surface with a soft cloth until the surface is smooth again.

If you have any questions concerning the construction of the Odyssey EP, please feel free to contact our Service Technicians at (217) 355-9511. Horizon's mailing address is:

Horizon Hobby, Inc.
4105 Fieldstone Road
Champaign, IL 61822

Thank you again for purchasing the E-Flight Odyssey EP sailplane. We believe you will have many enjoyable hours of challenging and rewarding flight.

Additional Required Equipment

Radio Equipment

- 3 channels (minimum)
- 3 standard servos
- On/Off switch
- 6- or 7-cell sub-C battery
- 270-600mAh receiver-pack

You will need at least a 3-channel radio system with three servos on an aircraft frequency for use in your Odyssey EP. A standard radio system (4 channels with standard servos) will work fine. Standard size servos will fit into the fuselage of the Odyssey EP. A wood adaptor plate is provided for use with micro servos. A micro switch to control operation of the electric motor is also provided .

A 6 or 7-cell sub-C will be required for motor operation. The battery fits under the wing.. A separate battery pack (270mAh to 600mAh) is required for the receiver.

JR XF421EX

Recommended JR® System

- JR XF421EX System with 3 standard servos

Recommended Battery

- HAN9510 6-Cell1500mAh Battery

HAN9510

Optional Equipment

- EFLA102 Maxx 25 Speed Control W/Arm Switch
- HAN9512 Hi-Thrust Pack 800 7C Hump Ni-Cd
- HAN9511 Duration Pack 2400 6C Flat Ni-Cd

EFLA102

Field Equipment Needed

Motor Battery/Charger

A standard 6/7-cell battery pack (7.2 - 8.4 v/1500mAh) is suggested to be used to power the electric motor in the Odyssey EP sailplane. The Hangar 9 Aero Peak™ charger can be used to fast charge the motor battery.

HAN9500

Optional Field Equipment

TX/RX Quick Charger

It's helpful to have a quick charger that can be used at the field to recharge your transmitter and reciever batteries after long flights. There are many types, but look for one that can be used off of an external power supply such as a 12V battery. Before using any fast field charger, check the operating instructions for the charger.

HAN114

Required Tools
(not included in kit)

- Hobby knife
- Phillips screwdriver
- Medium sand paper
- Felt-tipped pen
- Blue locktite
- Drill
- Drill Bit: 1/16"
- Ruler

Adhesives

- Scotch tape
- Double-sided tape or Velcro®
- Masking tape

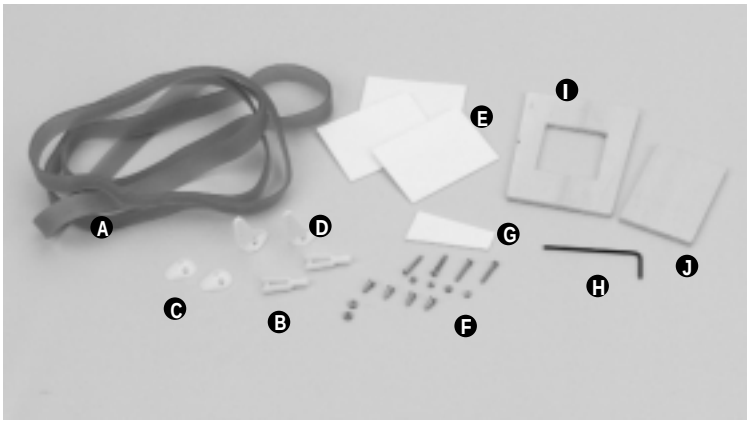
Kit Contents

Main Parts

1. Left wing
2. Right wing
3. Horizontal stabilizer/elevator
4. Vertical stabilizer/rudder
5. Fuselage w/motor and wiring harness
6. Canopy
7. Wing joiners

Other Parts

A. #64 Rubber bands (4)
B. Clevis (2)
C. Control horn plate (2)
D. Control horn (2)
E. Double sided tape
F. 2 mm control horn screws and nuts (4)
G. Micro switch mount
H. Allen wrench
I. Micro server adapter plate
J. Micro switch servo mount



Section 1: Joining the Wing

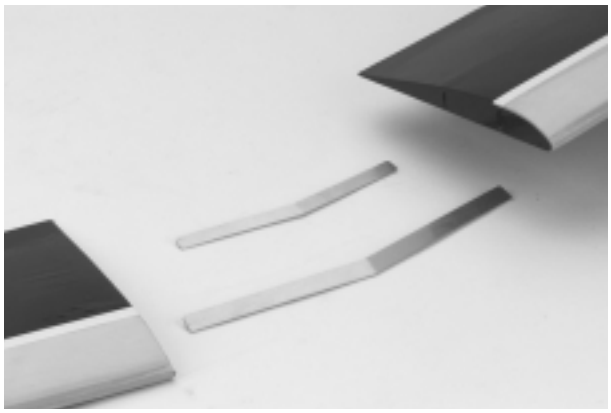
Parts Needed

- Right wing panel
- Left wing panel
- Aluminum wing joiners (Braces)

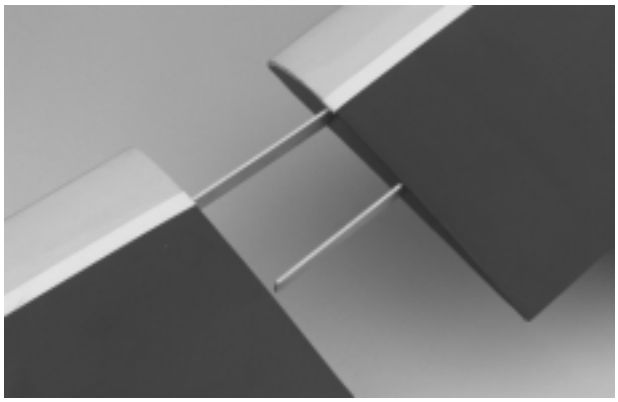
Tools and Adhesives Needed

- Scotch tape

Step 1. Locate the two wing panels and aluminum wing joiners.



Step 2. Trial fit the two wing joiners (dihedral braces) into one of the wing halves. They should insert smoothly. Now slide the other wing half onto the wing joiners until the wing halves meet.



Step 3. Tape the wing halves together using scotch tape. This allows for easy breakdown of the wing for transportation.

Section 2: Installing Rudder and Elevator Control horns

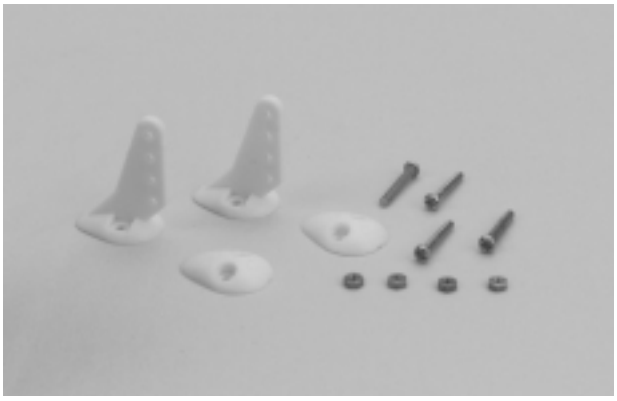
Parts Needed

- Horizontal stabilizer with elevator attached
- Vertical stabilizer with rudder attached
- Nylon control horns (2)
- Nylon backplates (2)
- 2 mm screws (4)
- 2 mm nuts (4)

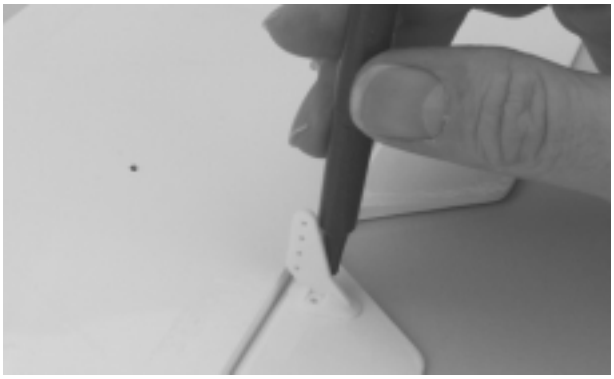
Tools and Adhesives Needed

- Medium Phillips screwdriver
- Felt-tipped Pen
- Drill Bit: 1/16"
- Drill

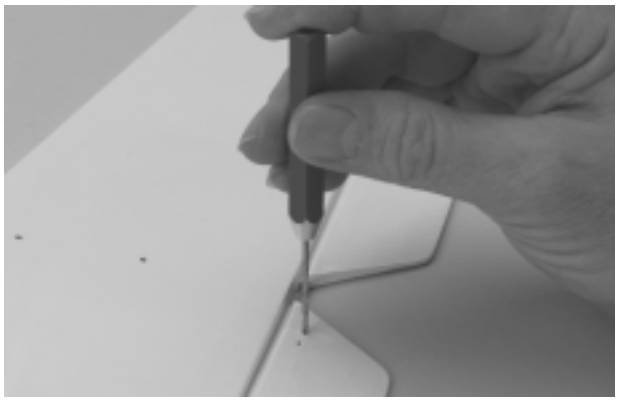
Step 1. You will attach the rudder and elevator control horns next. Locate the two nylon control horns, the two backplates and the four 2 mm control horn screws and nuts



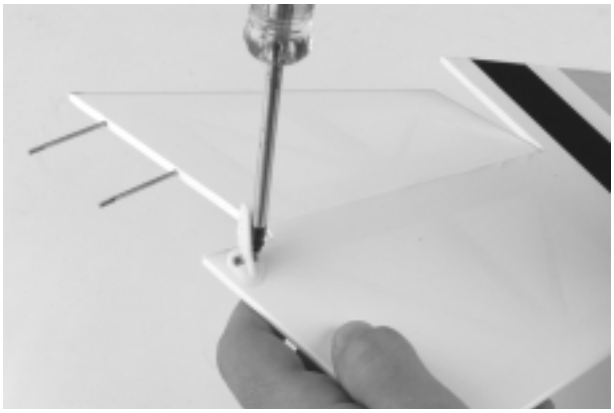
Step 2. Install the elevator control horn first. It will be located on the bottom of the elevator, as shown in the photo below. Please note that the trim is located on top of the elevator.

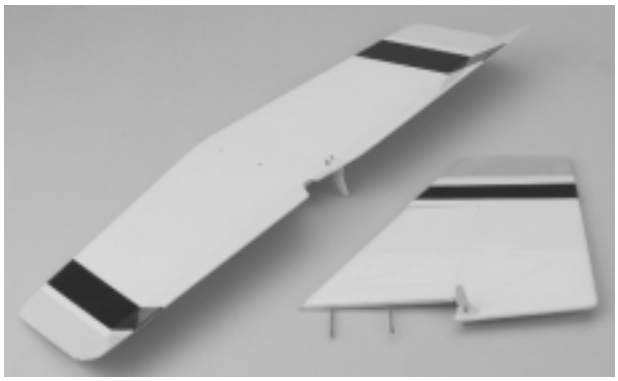


Step 3. Mark the post where the horn will be placed using a felt-tipped marker and drill the marked locations using a 1/16" drill bit.



Step 4. Mount the rudder control horn to the vertical fin/rudder using the two screws and nuts provided. Mount the control horn on the left side of the rudder using the same method as above.





Section 3: Installing the Tail

Parts Needed

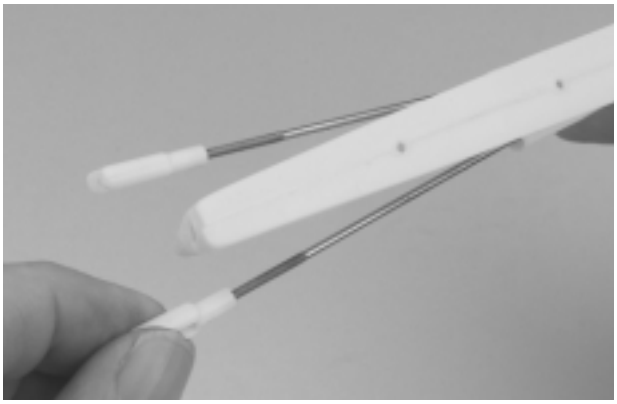
- Fuselage
- Horizontal stabilizer with elevator
- Vertical stabilizer with rudder
- Hardware package

Tools and Adhesives Needed

- Hobby knife
- Phillips screwdriver
- Blue Locktite
- Adjustable wrench

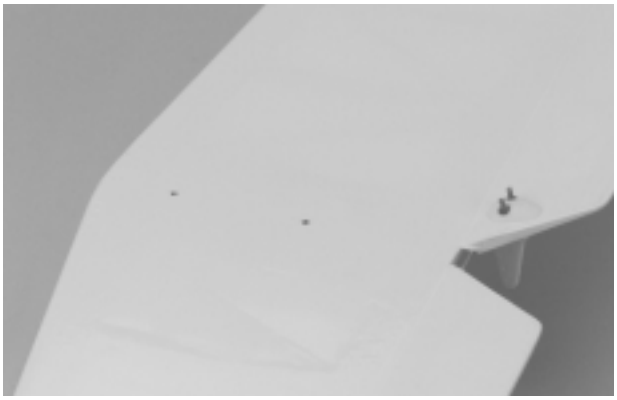
Caution: The 2 mm nuts used to mount the tail assembly to the fuselage are small and easily lost. Use great care during that part of the assembly so you do not inadvertly lose these parts.

Step 1. Locate the two white plastic clevises and screw them onto the pushrods 10 turns at the rear of the fuselage. This will prevent the pushrods from sliding out of the fuselage.

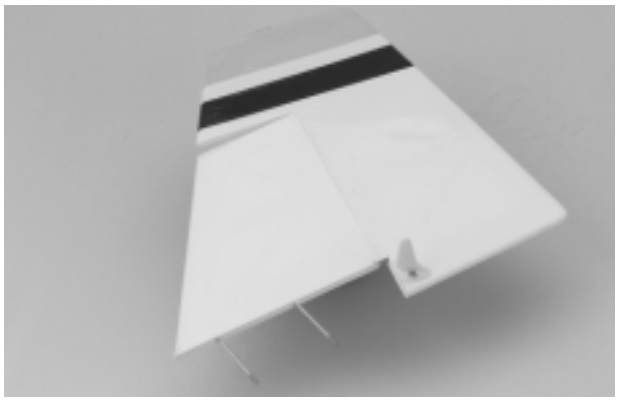


Note: The control surfaces, elevator and rudder are prehinged using the covering applied to the tail structure. Check to make sure the covering is secure. If necessary, a sealing iron can be used to re-adhere the covering.

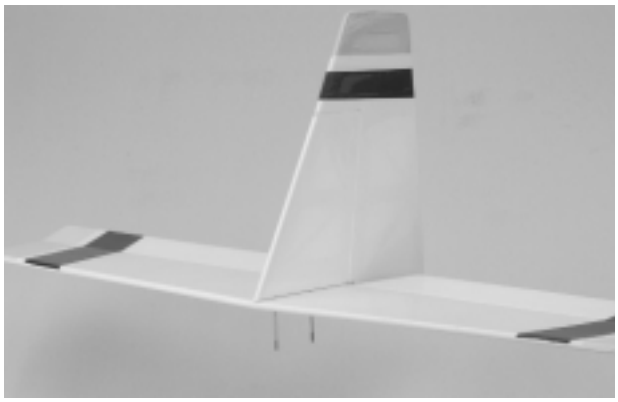
Step 2. Locate the horizontal stabilizer and elevator that will be attached to the fuselage.



Step 3. Locate the vertical tail fin and rudder.



Step 4. Mount the vertical fin and rudder to the horizontal stabilizer and elevator by sliding the two metal rods through the holes in the horizontal stabilizer. Then push the rods through the fuselage and lock them in place using an adjustable wrench the two 2 mm nuts. Use blue Locktite on the threads to secure the nuts in place.



Step 5. Attach the elevator and rudder clevises to the outter most hole on the control horns. See page 15 for "Control Throw."

Section 4: Installing the Radio

Parts Needed

- 3- or more-channel radio system with 3 standard servos and hardware (not included)
- Radio packing foam (not included)
- Adapter plate if micro servos are used

Tools and Adhesives Needed

- Small Phillips screwdriver
- Hobby knife with #11 blade
- Pencil or felt-tipped pen
- Double-sided servo tape
- Velcro®

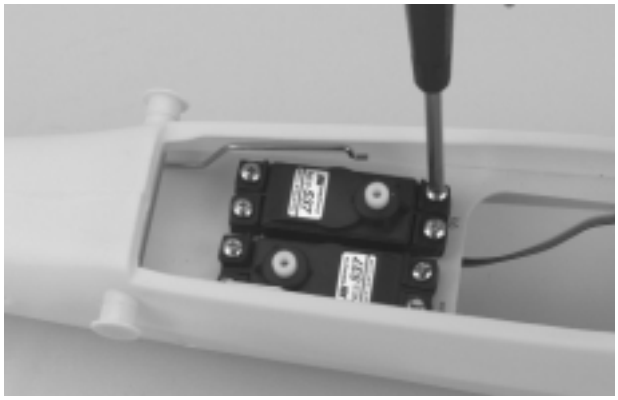
Note: Velcro® tape is used for mounting the receiver and battery pack.

Step 1. Install the grommets and eyelets in the three servos per the instructions included with the radio.

Step 2. Locate the servo tray mounted in the fuselage.

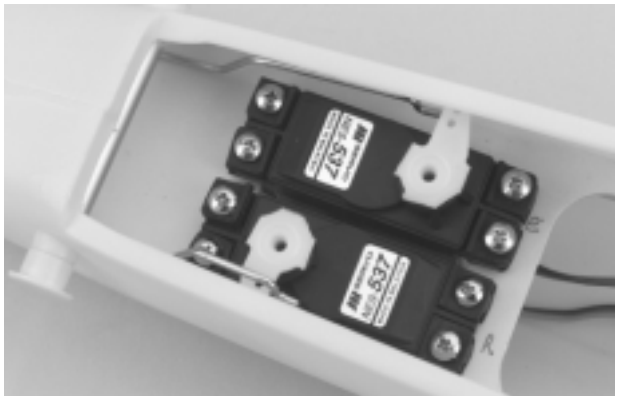
Note: The rails have holes drilled for standard servos. If you plan to use micro servos, use the plywood square to mount them. Trial fit the two servos on the rails. Try to place each servo close to the sides of the fuselage, as shown below. It's a good idea to remove the two servo arms at this time to make it easier to fit the servos in place

Step 3. Using a Phillips screwdriver, screw the eight screws to secure the servos.

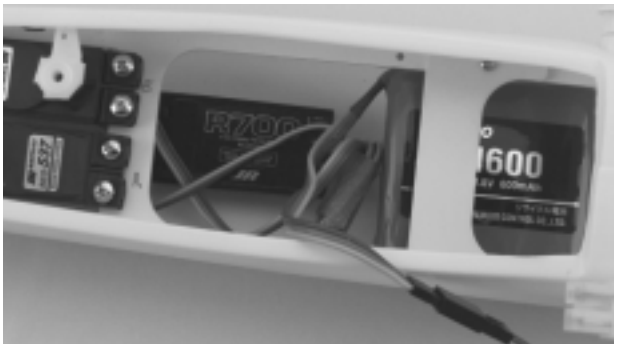


Step 4. Remove the servo arms from the servos if you have not already done so. Only one arm of a servo arm will be used, the other three will be trimmed off so the arms do not bind with the side of the fuselage. Please refer to the photo below before trimming the arm. The elevator and motor control servos will utilize the bottom arm as you look down at the servo arm; the rudder will utilize the upper arm as you look down at the servo arm. Trim off the other excess arms using a sharp hobby knife.

Step 5. Electronically center the servos and install the servo arms.

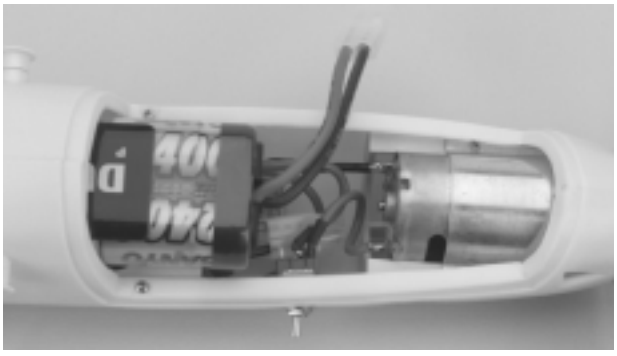


Step 6. Attach the appropriate servo leads to the receiver. Use Velcro® to mount the receiver and receiver battery to the bottom of the fuselage compartment.

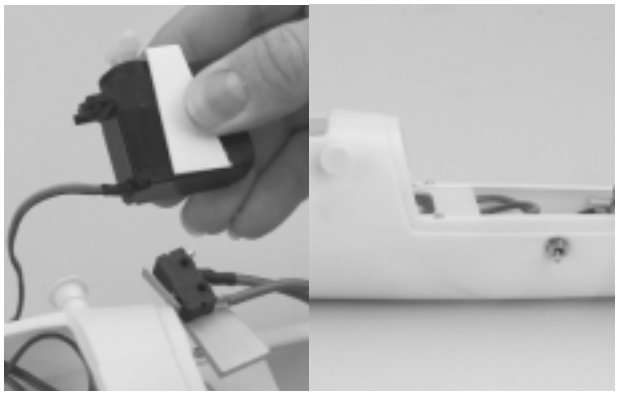


Step 7. The receiver antenna will be run from the opening in the fuselage area out to the fuselage tail.

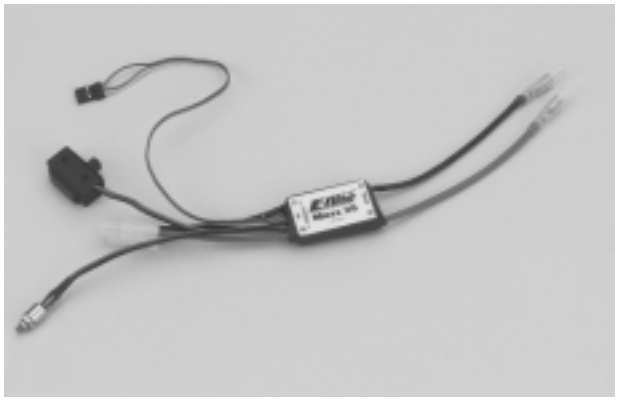
Step 8. Before mounting the motor battery pack into the fuselage tray, apply a strip of Velcro® to both the tray and the battery. This will help to keep the battery in place. Balance of the Odessey EP can be adjusted to some degree by moving the motor battery pack back and forth on the fuselage tray. Always try this first before adding any weight to the aircraft. Refer to Section 9, "Balancing the Odessey EP," for more information.



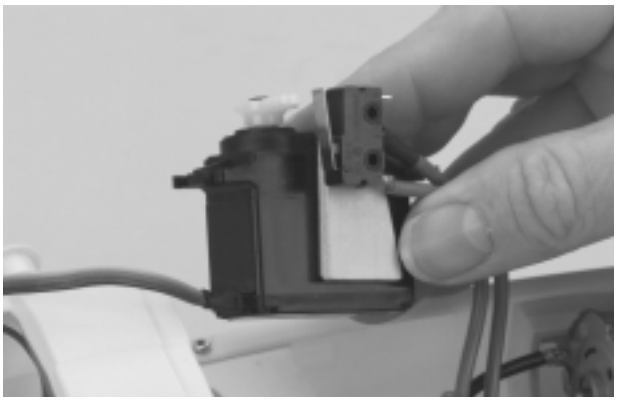
Step 9. A micro On/Off switch and a single-pole/double-throw switch are installed in the sides of the fuselage near the motor and the radio compartment. The micro switch is to power the receiver and the single pole/double throw switch is an "arming switch." The arming switch prevents unwanted power from being applied to the motor and prevents accidental startup. Remember the propeller has sharp edges and can cause injury if you stick your hand or fingers into it when it is operating.



Note: If you plan on using an electronic speed control, the receiver battery will not be required, the motor battery will provide power for the receiver, as well as the motor. Refer to the manufacturer's operating instructions for proper hook up of an electronic speed control.

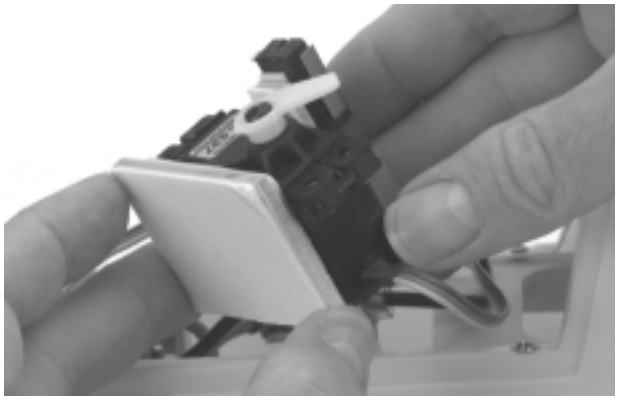


Step 10. The micro-switch is used to turn the motor on and off in flight. Use double-sided servo tape to attach the micro-switch to the side of the servo as shown below.



Step 11. A servo is used to activate the micro-switch through the use of the servo arm. If you have not done so, trim three of the four arms off of the servo arm, leaving the one that faces up as you look down at the servo. You only need one of the arms to activate the switch. Use double-sided tape to mount the servo to the bottom of the provided plywood tray in such a position as to allow the servo arm to depress (turns motor on) the switch when the servo moves in one direction and release (turns the motor off) the switch when the arm is moved in the opposite direction. The motor should come on only when the micro switch is depressed. The servo can be connected to the throttle servo so that the micro-switch is activated when the throttle is full on.

Step 12. Attach the servo to the plywood servo mount plate using double-sided servo tape. Apply another section of double-sided servo tape to the bottom of the mount plate to attach it into the fuselage.



Step 13. Place the plywood plate with the micro switch/servo into the area of the fuselage aft of the motor near the arming switch position and attach with double-sided servo tape.

Section 5: Installing the Control Linkages

Parts Needed

- Fuselage
- Pushrod , threaded on one end (1)
- Pushrod wire, threaded on one end (1)
- Clevis (2)
- Clevis keeper (used to keep clevis closed)
  (2 pieces of fuel tubing 7mm long - not included)

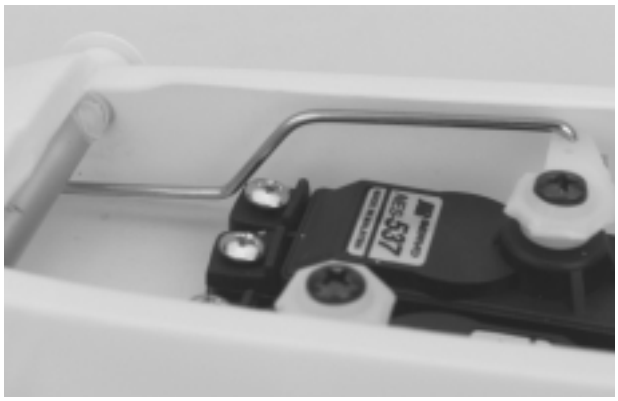
Tools and Adhesives Needed

- Felt-tipped pen or pencil
- Hobby knife
- Masking tape
- Ruler

Step 1. Locate the control linkages for rudder and elevator that are installed in the fuselage.

Step 2. Check to see that the clevis for the elevator and rudder are attached and a clevis keeper (piece of fuel tubing) is installed.

Step 3. Make sure the rudder and elevator servo arms are centered, and attach the metal pushrods to the respective servo arms. The control linkage length can be adjusted by threading the clevis at the control horn in or out.



Step 4. With the rudder and elevator pushrods attached, and the micro switch/servo installed, check the function of the controls by turning on the transmitter, then the receiver.

Caution: Be sure the throttle stick on your transmitter is at the low-speed position. Use extreme care when first engaging the throttle. Be sure the propeller is clear of any obstruction, especially your hands or any part of your body.

Turn on the radio On/Off switch. Turn on the "Arming" switch. Check the function of the rudder, elevator, and throttle controls.

Step 5. Make any necessary adjustments to control linkages, or servo arm position to micro-switch so that the controls move freely without any servo binding and that the motor turns on and off. Also check to make sure the "Arming" switch functions properly by having the system on and running, and then turning off the arming switch. The motor should stop.

Section 6: Installing the Canopy

Parts Needed

- Fuselage
- Canopy

Step 1. Slide in rear canopy pin in pre-drilled hole in rear of the canopy opening on the fuselage.

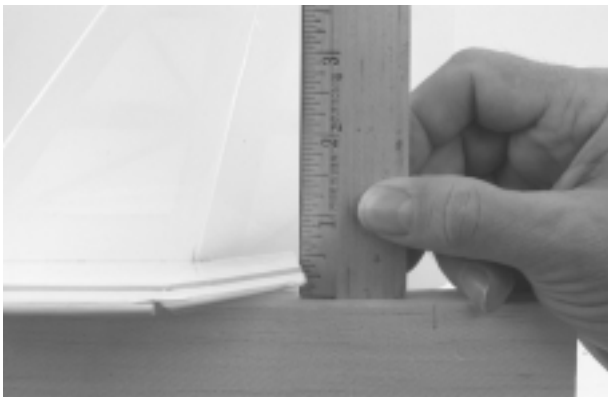
Step 2. Pull back the canopy lever on the top of the canopy and place the canopy pin in the predrilled hole on the front of the canopy area on the fuselage.

Section 7: Control Throw Recommendations

The control throws listed below are a good place to start. After you have become more comfortable with the flight performance of the Odyssey, you can adjust the control throws to satisfy your style of flying.

Elevator: 3/8" UP 3/8" Down
Rudder 1 3/4" Right 1 3/4" Left

Note: The control throw is measured at the point of the control surface farthest from the hinge line. You can change the control linkage attachment points in or out on the control horns and/or servo arms to change the amount of throw on each surface.



Section 8: Balancing the Odyssey

Parts Needed

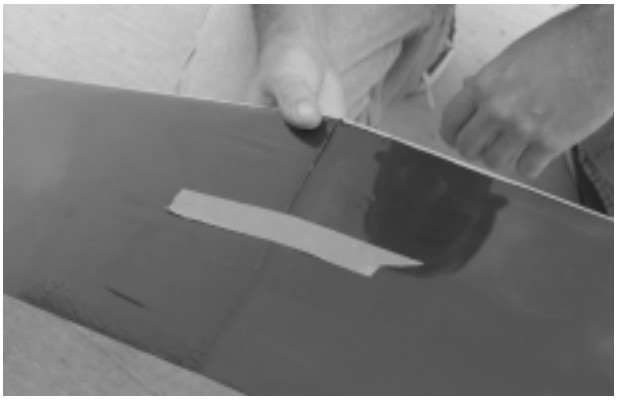
- Assembled Odyssey kit

Tools and Adhesives Needed

- Masking tape
- Pencil or pen
- Lead "Stick-on" weights (optional)

Step 1. The balancing of your Odyssey EP is an important step that must not be omitted. The center of gravity (CG) of your Odyssey EP should be 3 $^{3}/_{16}$" behind the leading edge of the wing at the fuselage. Shift the motor battery fully forward to balance the model if it is tail heavy or add weight to the nose. If the model is nose heavy you can shift the position of the receiver battery location in an attempt to balance the model, or add weight to the tail (fuselage). Note that adding weight is the last option.

Step 2. To balance the model, it should be fully assembled with the radio and receiver battery installed and ready to fly. Place a strip of masking tape on either side of the wings lower surface, next to the fuselage.



Step 3. Mark the location of the CG on the bottom of the wing either side of the fuselage.

Step 4. Pick up the plane from a level position using one finger under the wing on each mark. Shift the battery location or add lead weight until the plane remains level when you pick it up.

Section 9: Thermal Soaring

A key component to soaring is the air mass the sailplane flies in. Also, there is an energy source producing lift, either a warm air thermal (thermal lift), or the wind rising as it meets an obstacle such as a hill or a line of mountains (ridge lift). We will limit our discussion to describing thermal soaring.

We will be using the electric motor to launch our sailplane to altitude. Once at altitude we shut down the motor and the sailplane will soar, eventually to return to earth until we use the motor to climb again. How then does a sailplane stay aloft for long periods of time and travel long distances? Some force has to provide sufficient lift to overcome gravity when the motor is not used.

One such force is the thermal. The thermal is simply a column of rising warm air. Warm air is lighter (less dense) than cooler air and thus rises. The term "differential heating" is used to describe the generation of thermals. Descending cool air is known as "sink."

The principle of warm vs cool air is used by balloonists to launch and fly their hot air balloons. They create and trap warm air inside the balloon envelope, and the warm air displaces the cool air, causing the balloon to inflate and rise until air begins to cool inside the envelope. The balloonist simply uses a propane heater to warm the air again and the balloon rises again or maintains its altitude.

Nature generates thermals by the sun heating darker ground or objects more that lighter colored surfaces. The dark object absorbs the sun's heat becoming warm and thus warming the air above it.

For a thermal to be formed, the sun (or a heat source, such as a hot metal roof, factory, etc.,) will heat the ground or surrounding air in one location faster or warmer than the surrounding air. The warm ground will warm the air above it and cause the air to begin to rise. Rising warm air can take on the form of a column or a funnel. Usually the part of the thermal near the ground is small and expands outward as it rises in altitude.

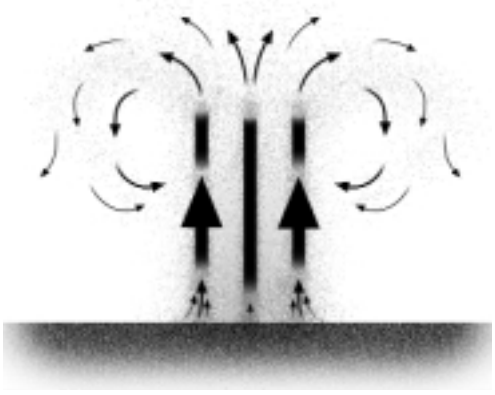
Since the warming of air is usually a much smaller area than the total area, the thermal updraft will be faster than the cooler downdraft motion of air. This cooler downdraft of air is referred to as "sink" and causes glider flights to be of a much shorter duration as the lift generated by the wing is overcome by the downward motion of the air.

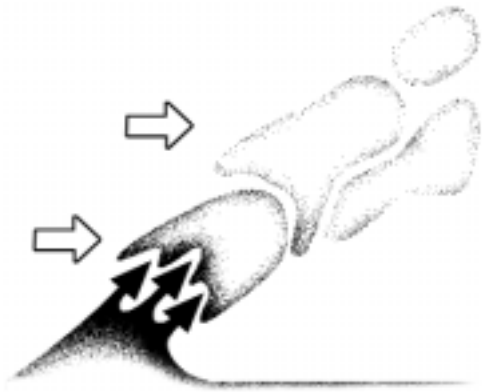
To stay aloft one's task is to move from one thermal to another, utilizing the lift created by rising warm air. In level flight, a glider continuously descends in relation to the surrounding air. The only way to sustain flight in a glider beyond the sink time in still air (without a motor) is to fly in an air mass that is rising at a rate greater than the sink rate of the glider.

Thermals usually cannot be seen. (An exception is a "dust devil—a small thermal that has picked up dust making it visible.) One can sometimes "feel" the presence of a thermal. A breath of air in an otherwise calm spot indicates the presence of a thermal. A shift in the wind (in a light breeze) probably indicates airflow into a thermal. And one can watch for the graceful soaring of birds, such as hawks and eagles to locate the presence of thermals.

Sometimes the wind will cause the thermal to bend or break causing a warm air bubble that slowly travels downwind as it rises. Thermals can vary in strength, rising at speeds of a few hundred to over a thousand feet per minute.

Thermal Forms (Column)





Thermal Forms (Bubble)

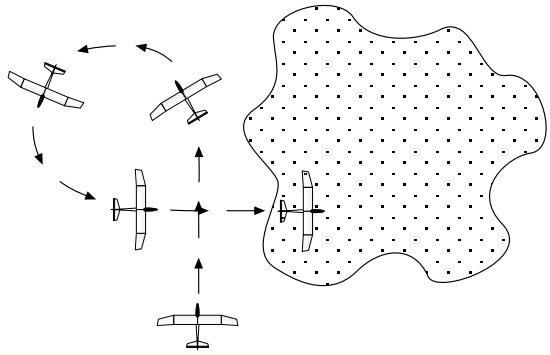
As you are flying your Odyssey EP, watch it carefully. If you were in a full-size glider, you would be able to feel the "bump" of entering a thermal. Now you must depend on signs the glider gives as it approaches or enters a thermal.

When the Odyssey flies near a thermal that is rising, the wing closest to the thermal will also try to rise, causing the aircraft to

"rock" slightly. The nearness of a thermal will cause the glider to "turn away" without any control input from the pilot.

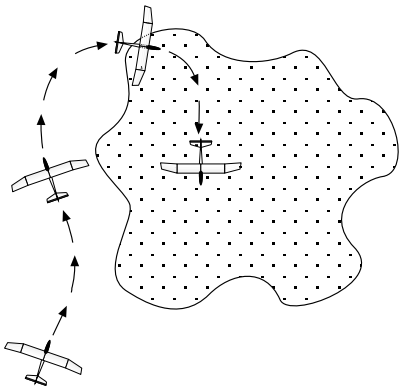
There are several ways of entering a thermal. One is to continue the thermal induced turn for 270 degrees. If the thermal is on your left, turn right for 270 degrees and enter at a right angle to the original flight path.

270° Turn Into a Thermal



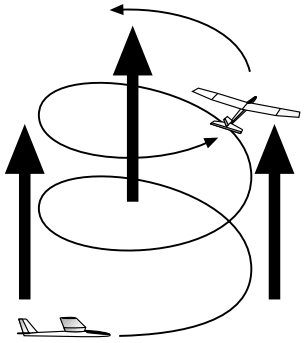
The second method is to make a wide 180-degree turn back into the thermal.

180° Turn Into a Thermal



Once in the thermal, you will need to try to stay in the center of the lift. Slow down by increasing the up elevator "trim" until the sailplane is just above a stall (minimum sink speed). Make easy banking turns to find the area of highest lift (thermal core). When you have found the core of lift, tighten the turns to stay within the core of highest lift.

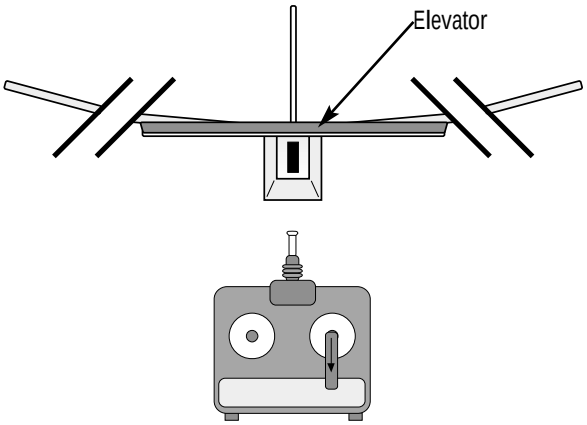
Flying in the Core of a Thermal



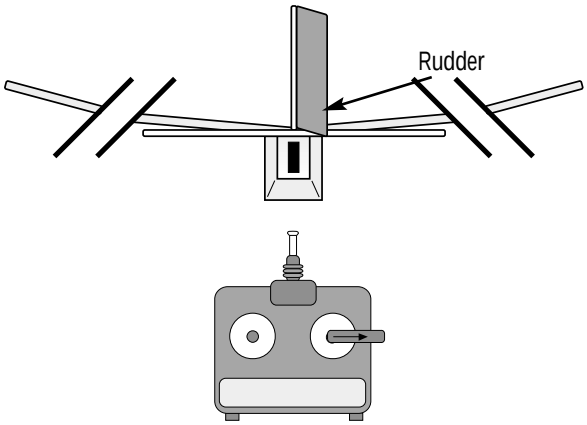
As you gain experience, you will find it easier to locate thermals and track their progress.

Section 10: Preflight Checks

Step 1. Check that all control functions move in the correct direction. If not, use the respective reversing switch to correct the direction.



Elevator



Rudder

Step 2. Check that each clevis is securely snapped into position. Be sure to use the clevis locking devices (small pieces of tubing slipped over the clevis to hold the clevis closed and prevent accidental opening in flight).

Step 3. Check that all servo horn screws are tight.

Step 4. Charge the transmitter and receiver batteries per the instructions included with the radio system.

Step 5. Range check your radio system per the manufacturer's instructions.

Section 11: Test Glide

You will need to balance your Odyssey EP™ after you've completed assembly and have installed the receiver, battery, and servos. Use of the stick-on type of weights is recommended and can be obtained at your dealer. Before adding weight to the sailplane, try moving the battery pack to adjust the center of gravity (usually as far forward as possible).

We strongly recommend that before you fly your new Odyssey EP, you first perform a test glide. Pick a flat spot that has soft, tall grass and is free from obstructions. You first want to check out the Odyssey's performance but also check your performance as a pilot. It also allows you to make corrections to any building or control defects that may have been overlooked.

The test glide should be done with an assistant on a calm day.

Hint: A good time during the day is very early in the morning or at dusk when the wind is calm. You want to be able to concentrate on what the model is doing, and have time to think about what you're doing. We will assume you have an assistant during the following steps.

Step 1. Range check your radio system and check the control throws. Make sure the control surfaces move in the proper direction.

Step 2. Have the assistant hold the Odyssey EP under the wing near the CG and run forward until they can sense the wing developing lift. Don't release the glider yet. See if the model wants to lift. If not, add a bit of up elevator trim and try again.

Step 3. This step may take some practice on the part of your assistant. What you want them to do now is run forward, but a bit faster, with the nose of the Odyssey EP pointed at the horizon with the wings level (not nose down or nose up). Then thrust the Odyssey EP forward in a line straight toward the horizon and release it.

Step 4. When the assistant releases the model, watch it carefully. A properly trimmed aircraft will fly straight forward gliding to a smooth landing about 50 feet away. If the Odyssey EP pitches nose down, the CG is too far back and you have a nose heavy condition. Remove some weight from the nose. If the Odyssey pitches nose up sharply, and stalls, you have a tail heavy condition (the CG is too far forward), and you need to remove weight from the tail or move the battery and receiver further forward.

Step 5. Turns to the left or right after launch can be adjusted through use of right or left rudder trim.

Important: Make any trim adjustments in small increments. Large changes can result in abrupt turns resulting in tip stalls and loss of control.

Step 6. If you have to make large trim adjustments on your transmitter, you may have other problems, such as warps. Check the wings, elevator, and rudder to make sure there are no warps in the airframe. Make sure the wings are aligned or mounted properly on the fuselage.

When you have the Odyssey EP trimmed and the CG adjusted so it glides properly in a "hands-off" manner, return you transmitter trim switches to their neutral position, then make the appropriate mechanical linkage corrections to return the control surfaces to their test glide positions.

Step 7. After you have made the necessary corrections, test glide the model again to make sure it is trimmed properly with the transmitter trims in neutral.

Step 8. You are now ready to launch under power. Apply power and have your assistant run forwards as before. Gently throw the Odyssey EP at a point on the horizon. Let the aircraft gain speed before attempting to make any abrupt changes in direction. Remember to make small control inputs, you do not want to stall close to the ground. Use a slight bit of "up elevator and allow the Odyssey EP to make a gentle climb to 200-300 feet. You can then shut down the motor and go hunting for thermals.

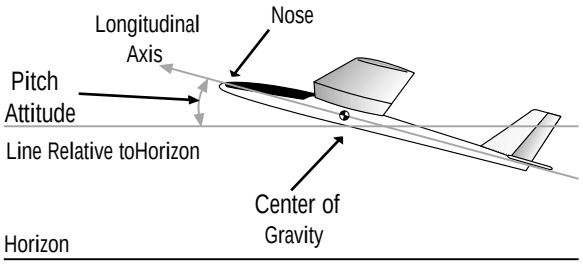
Section 12: In-Flight Adjustments for Performance and Conditions

Once the fundamentals of launch, trim, and control of the Odyssey EP are learned, it's time to consider getting the most out of the it's ability to perform. To do that, one must learn how to trim the Odyssey for maximum performance, whatever the current conditions are at the time.

The key to trimming the Odyssey EP for maximum performance is to become knowledgeable of three key speeds: minimum sink, maximum lift/drag (L/D), and best penetration. These three speeds are what we call airspeeds, not ground speeds (the aircraft's speed across the ground). Thus the airspeed of the Odyssey EP is relative to the air mass surrounding it.

To determine the Odyssey's airspeed, you will have to watch carefully for its pitch atttitude. Pitch attitude can best be described as the amount (degree) the nose of the aircraft is above or below a line relative to the horizon. The angle of attack term is used to describe the angle between the chord (width) of the wing and the direction the wing moves through the air.

Pitch Attitude



Minimum Sink Speed

In our discussion of thermals, we know sink is the cooler air moving downward to replace the warm air that is rising. Minimum sink speed is the speed at which a sailplane loses altitude most slowly. As the term then implies, minimum sink speed gives the glider the maximum amount of time aloft from a given altitude. This is the speed to fly at when you are circling in thermals, or whenever you need the maximum lift the glider can produce. The pitch attitude will appear to be more nose up.

To determine what this speed is for your Odyssey EP, you will need to fly at a slow speed, slowing down until it just stalls, then, trim it to fly at a speed just above where it begins to stall. Observe the pitch attitude at this speed. You will need to practice flying at this speed without stalling so you can come back to it whenever you want to when you are in a thermal or trying to maintain maximum lift.

Maximum Lift/Drag (L/D) Speed

This is the speed at which you can fly the maximum distance for a given altitude. It's used when you move from one thermal to another, or when you need to cover the maximum distance over ground. This will be a moderately faster airspeed than the minimum sink speed. You will have to experiment by starting from the minimum sink speed and add small amounts of down trim to increase speed slightly. This is the speed the Odyssey performs the best for duration, and the speed at which you will do most of your flying. It will take practice until you are familiar with the Odyssey's attitude at this speed. Remember you will be flying slightly faster, at a lower pitch attitude as compared to minimum sink speed.

Best Penetration Speed

This is the speed at which the Odyssey EP will travel forward against the wind or a thermal, as far and as quickly as possible. This speed will vary with the conditions, such as windy situations or very strong thermals. You will want to use this speed to escape from very strong lift (or sink). This speed has a more pronounced nose down appearance, which will vary with the conditions encountered. It will also not be a consistent attitude, but vary with the strength and direction of the lift/sink or wind.

Once you have learned to launch and control your Odyssey EP in a consistent manner, you will want to then proceed with practicing these three speeds. Remember these are trim speeds, so you will be using your trim lever to obtain them. For maximum performance, remember to use trim sparingly, don't depend on the stick as you will only impart small movements that result in drag and battery drain.

Practice smooth control inputs and use the trim lever. (Remember you trimmed the Odyssey EP in the first flights, then set the mechanical linkages to reflect the trim imparted. You then set your trim levers back to neutral. Now you know why we performed that procedure, to allow you to use the trim lever for in-flight trim to better control flight performance.)

There are other things that can be done to bring the performance level of your Odyssey EP to its absolute best. However, they should not be attempted until you have become proficient in the launch, control, and trim of your model.

The more you learn how to trim your Odyssey EP for optimum performance, the more fun you can have chasing thermals!

Section 13: Definitions

Activating (Arming) Switch: an external switch that prevents the electric motor from accidentally turning on

Aerodynamics: science of air in motion

Angle of Attack (AOA): angle between the chord of the wing and the relative wind that strikes the airfoil; independent of the attitude of the sailplane with respect to the horizon

Auto-Peak: type of battery charger that automatically shuts off when a battery has been fully charged

Axis: a line passing through a body about which the body revolves

Battery Cycling: repeated charge and discharge of a battery to erase battery memory

Battery Memory: term used to explain why a battery is unable to take on a full charge because of insufficient discharging before recharging

Capacity: amount of charge or electricity a battery can hold

Center of Gravity (CG): balancing point of an aircraft

Critical Angle of Attack: angle of attack at which smooth airflow over the top of the wing stops

Electrolyte: a caustic material found in batteries

Harness: a device consisting of wires, switches, and a fuse that connects the motor to the battery

L/D: lift divided by drag expressed as a ratio; the same as a glide ratio (think of L/D as a glide slope, then, for a given amount of distance, the sailplane moves forward it drops a certain amount.)

Minimum Sink: the speed at which a sailplane loses altitude most slowly, expressed in feet per minute

Ni-Cd (Nickel Cadium) Battery: a rechargeable battery used for radio control airplanes

Penetrate: to make progress against the wind

Pitch: degree of nose up or nose down from level to the horizon

Relative Wind: direction that the air molecules strike the leading edge of the wing

SCR: a battery designed to release a lot of energy over a short time without being damaged

Span: the maximum distance from wingtip to wingtip

Stall: loss of lift resulting from exceeding the critical angle of attack

Thermal: rising body of hot air that can take a sailplane to a great height

AMA Safety Code

2001 OFFICIAL AMA NATIONAL MODEL AIRCRAFT SAFETY CODE
Effective January 1, 2001

Model flying must be in accordance with this code in order for AMA Liability Protection to apply.

GENERAL

1. I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been successfully flight tested.

2. I will not fly my model higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.

3. Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.

4. At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed in front of the flight line. Flying over the spectator side of the lines is prohibited, unless beyond the control of the pilot(s). In any case, the maximum permissible takeoff weight of the models with fuel is 55 pounds.

5. At air shows or model flying demonstrations a single straight line must be established, one side of which is for flying, with the other side for spectators. Only those persons accredited by the contest director or other appropriate official as necessary for flight operations or as having duties or functions relating to the conduct of the show or demonstration are to be permitted on the flying side of the line. The only exceptions which may be permitted to the single straight line requirements, under special circumstances involving consideration of site conditions and model size, weight, speed, and power, must be jointly approved by the AMA president and the executive director.

6. Under all circumstances, if my model weighs over 20 pounds, I will fly it in accordance with paragraph 5 of this section of the AMA Safety Code.

7. I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. This does not apply to models while being flown indoors.

8. I will not operate models with metal-bladed propellers or with gaseous boosts, in which gases other than air enter their internal combustion engine(s); nor will I operate models with extremely hazardous fuels such as those containing tetranitromethane or hydrazine.

9. I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind) including, but not limited to, rockets, explosive bombs dropped from models, smoke bombs, all explosive gases (such as hydrogen-filled balloons), ground mounted devices launching a projectile. The only exceptions permitted are rockets flown in accordance with the National Model rocketry Safety Code or those permanently attached (as per JATO use); also those items authorized for Air Show Team use as defined by AST Advisory committee (document available from AMA HQ). In any case, models using rocked motors as a primary means of propulsion are limited to a maximum weight of 3.3 pounds and a G series motor. A model aircraft is defined as an aircraft with or without engine, not able to carry a human being.

10. I will not operate any turbo jet engine (axial or centrifugal flow) unless I have obtained a special waiver for such specific operations from the AMA President and Executive Director and I will abide by any restriction(s) imposed for such operation by them. (This does not apply to ducted fan models using piston engines or electric motors.)

11. I will not consume alcoholic beverages prior to, nor during, participation in any model operations.

RADIO CONTROL

1. I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.

2. I will not fly my model aircraft in the presence of spectators until I become a qualified flyer, unless assisted by an experienced helper.

3. I will perform my initial turn after takeoff away from the pit or spectator areas, and I will not thereafter fly over pit or spectator areas, unless beyond my control.

4. I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission. (Only properly licensed Amateurs are authorized to operate equipment on Amateur Band frequencies.)

5. I will not knowingly operate an R/C system within 3 miles of a pre-existing model club-flying site without a frequency sharing agreement with that club.

6. Models flown in air-to-air combat are limited to maximum total engine displacement of .30 cu. in. and a maximum of dry weight prior to flying of 4 pounds.

ORGANIZED RC RACING EVENT

7. An RC racing event, whether or not an AMA Rule Book event, is one in which model aircraft compete in flight over a prescribed course with the objective of finishing the course faster to determine the winner.

A. In every organized racing event in which contestants, callers and officials are on the course:

1. All officials, callers and contestants must properly wear helmets, which are OSHA, DOT, ANSI, SNELL, or NOCSAE approved or comparable standard while on the racecourse.

2. All officials will be off the course except for the starter and his/her assistant.

3. "On the course" is defined to mean any area beyond the pilot/staging area where actual flying takes place.

B. I will not fly my model aircraft in any organized racing event, which does not comply with paragraph A above or which allows models over 20 pounds unless that competition event is AMA sanctioned.

Refer to AMA Membership Manual 2001 for safety codes for Free Flight and Control Line Models. Separate code(s) available from AMA Headquarters for boats, cars, and rockets.

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