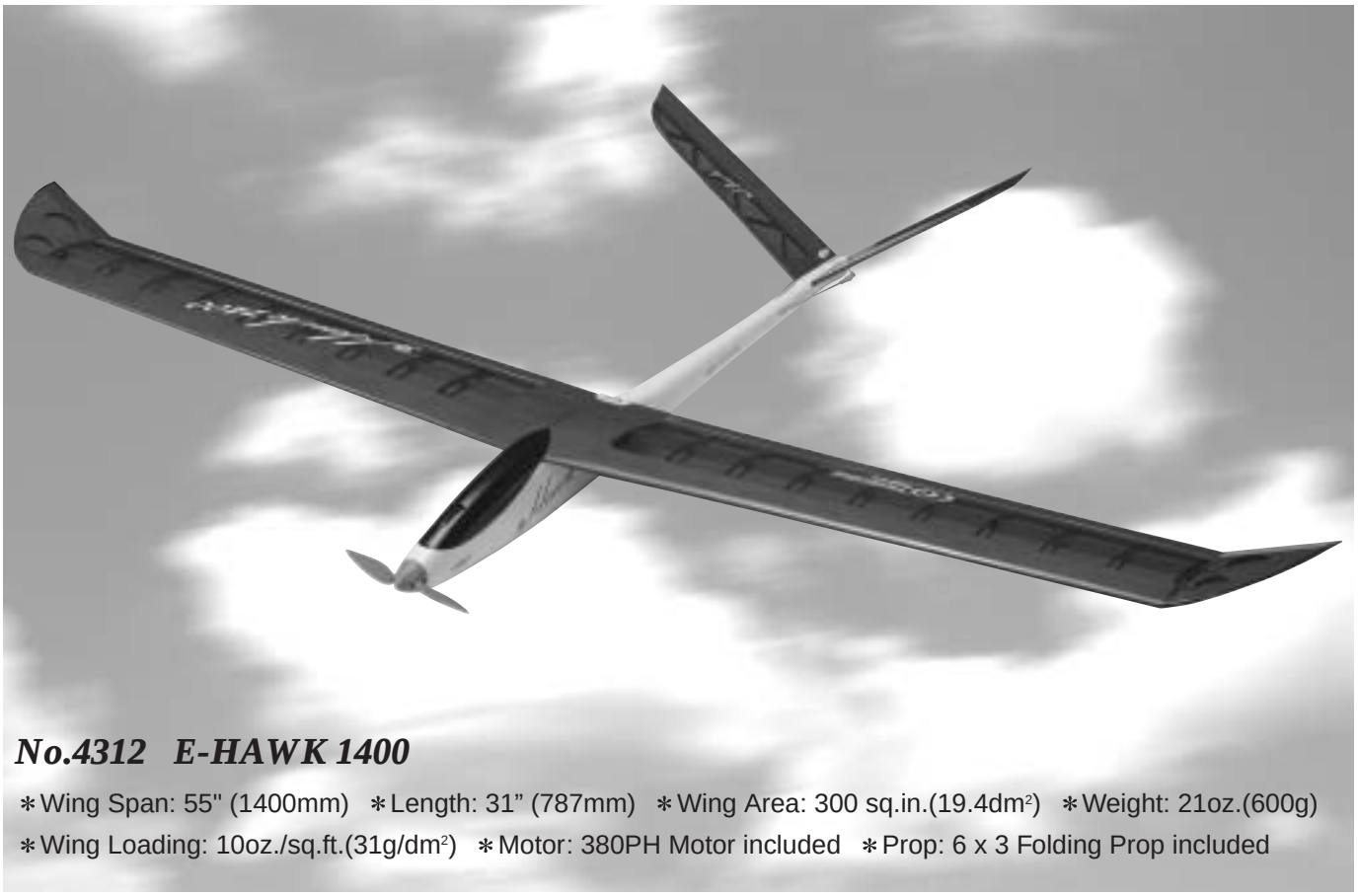
e Hawk 1400

Almost Ready To Fly

1.4M Electric Powered R/C Sailplane



No.4312 E-HAWK 1400

∗Wing Span: 55" (1400mm) ∗Length: 31" (787mm) ∗Wing Area: 300 sq.in.(19.4dm^2) ∗Weight: 21oz.(600g)
∗Wing Loading: 10oz./sq.ft.(31g/dm^2) ∗Motor: 380PH Motor included ∗Prop: 6 x 3 Folding Prop included

Warranty: This kit is guaranteed to be free from defects in material and workmanship at the date of purchase. It does not cover any damage caused by use or modification. The warranty does not extend beyond the product itself and is limited only to the original cost of the kit. By the act of building this user-assembled kit, the user accepts all resulting liability for damage caused by the final product. If the buyer is not prepared to accept this liability, it can be returned new and unused to the place of purchase for a refund.

Notice: Adult Supervision Required: This is not a toy. Assembly and flying of this product requires adult supervision. Read through this book completely and become familiar with the assembly and flight of this airplane. Inspect all parts for completeness and damage. Customers in North America please call 1-949-833-7498 for help if you encounter any problems.

INTRODUCTION

All of us at Thunder Tiger want to thank you for choosing the E-Hawk.This Kit has been engineered to go together quickly and easily while still providing you with great looks and exceptional flying performance. The world of electric powered sailplanes can be an extremely challenging and rewarding experience. Your skill along with the design capabilities of your model will combine to defy the laws of gravity and produce flights of unbelievable distance or duration. Under proper conditions your E-Hawk can stay aloft for hours from a single battery charge! As you gain experience with your model you will be able to “feel” the wing and lift conditions that affect it enabling you to greatly extend your flight times.

The E-Hawk is an electric powered 1.4-meter sailplane which is intended for use in light wind and lift conditions. Its airfoil, motor package and design planform are intended to maximize performance under those flying conditions and will provide great results for pilots of all skill levels.

We suggest that before beginning to assemble this kit you thoroughly read this assembly instruction manual to familiarize yourself with the complete assembly procedure. This will insure that your assembly process will be as smooth and uneventful as possible.

We are confident that you will enjoy flying your E-Hawk and that it will provide many hours of challenging and rewarding flight.

PRE-ASSEMBLY NOTES

1. If you are not an experienced R/C pilot plan to have a fully competent pilot help you to learn to fly your E-Hawk. This will help you to be successful much faster and also avoid potential damage to your model.

2. Please assemble your model exactly according to these instructions. Do not attempt to modify or change the E-Hawk in any way as doing so may adversely change its flying characteristics.

3. Before you begin please check the entire contents of this kit against the parts list and part drawings to be sure that no parts are missing or damaged. This will also help you to become familiar with each component of your E-Hawk. If you find that any of the parts are either missing or damaged please contact your dealer immediately for replacement. Note: Your dealer cannot accept kits for return if construction has begun.

For customers in the US and Canada please call or write to ACE Hobby Distributors, Inc for replacement of missing or damaged parts.

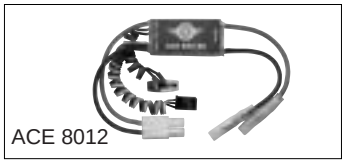
ACE Hobby Distributors, Inc.
2055 Main Street, Irvine, CA 92614
Tel: 949.833.0088
Fax: 949.833.0003
E-Mail: service@acehobby.com

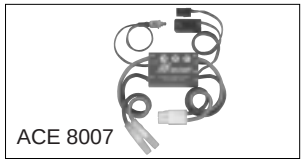
Remember. We have worked very hard to make this model as easy to assemble as possible while still maintaining our high standards of quality. Your assembly of this model is very important and will determine the final flight capabilities of your E-Hawk, so use extra care and follow the assembly procedure exactly.

OTHER ITEMS REQUIRED

Radio: You will need at least a 2~3 channel radio control system on an aircraft frequency for use in your E-Hawk. Recommend ACE Commander 3ch single stick raido (P/N ACE 8304) which comes with 2 Micro Servos and Mini Receiver. However, if you are really looking for every bit of extra performance then you should consider using one of the miniature radio systems available which would lower the weight and increase the performance of your E-Hawk.


ACE 8304

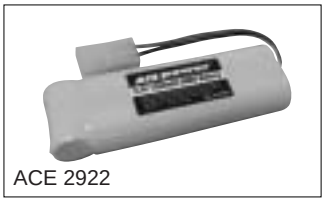

ACE 8012


ACE 8007

Electronic motor controller: We recommend the ACE8007 Auto Cut-Off Device (work with 2CH radio) or ACE8012 ESC-30 with BEC (work with 3CH radio) for controlling the power of your E-Hawk as well as eliminating the need for a separate radio battery. The BEC (Battery Eliminator Circuitry) in this controller will automatically turn off the power to the motor when the battery reaches a factory present discharge level leaving about 20-25 minutes of flight time for the radio system. Note: Some radio manufacturers offer a lightweight radio system with a built-in motor controller with BEC especially for this type of model.

Flight Battery: We recommend the use of ACE 2922 7 cell 8.4V 1000 mAh NiMH battery pack for maximum performance.

Charger: You will need a battery charger to charge your power battery. We recommend our ACE2604 8.4V DC Time Charger for 7-cell bettery pack. Note: When charging your flight battery be sure to very carefully follow the instructions provided with the charger.


ACE 2922


ACE 2604

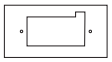
Extension Wire: 2 servo extensions in 6” long are required.

TOOLS AND SUPPLIES NEEDED

1. **12 Minute Epoxy**
2. **Thin CA Glue**
3. **Mixing Stick for Epoxy**
4. **Medium Grit Sandpaper**
5. **Rubbing Alcohol**
6. **Paper Towels**
7. **Hobby Knife**
8. **3/16″ Drill**
9. **1/16” Drill**
10. **Ruler**
11. **“ Z ” Bend Pliers**
12. **Pen, Pencil or Marker**
13. **Small Screw Drivers**
14. **Curved scissors**

Open the box and check that you have all the parts as shown below.
If anything is missing please contact your dealer

AS6239 Main Wing (T. Magenta)
AS6239L Main Wing (T. Blue)
AS6239Y Main Wing (T. Yellow)

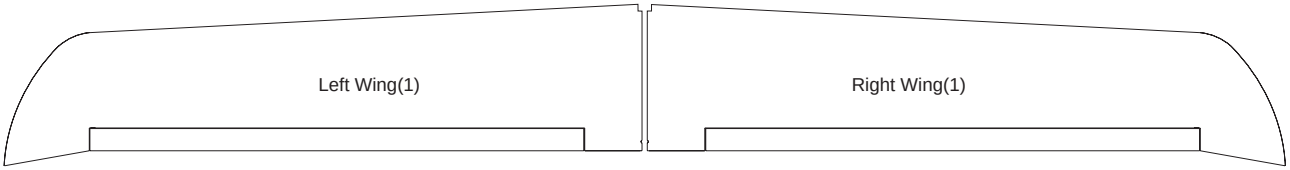

Aileron Servo Tray(1)


Wing Protector(1)

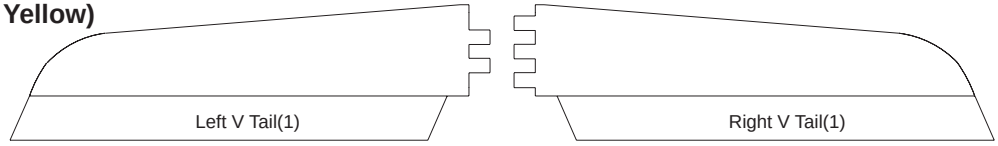

3x12mm Wood Screw(2)

Wing Join Wire(1)

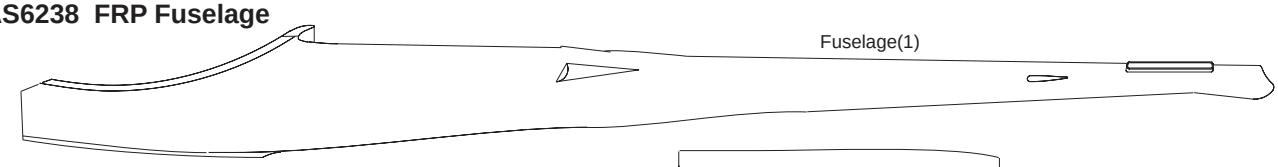
CA Hinge(6)



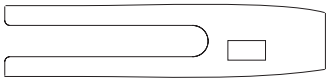
AS6240 Tail Feathers (T. Magenta)
AS6240L Tail Feathers (T. Blue)
AS6240Y Tail Feathers (T. Yellow)



AS6238 FRP Fuselage


Fuselage(1)


Motor Mount(1)


Servo Tray(1)


Wing Mount(2)

AS6026 6x3 Folding Prop


Spinner(1)


Back Plate(1)

Pin(2)


Blade(2)

2x8mm Screw(1)

3x3mm Set Screw(2)

AS6244 Decal (T. Magenta)
AS6244L Decal (T. Blue)
AS6244Y Decal (T. Yellow)

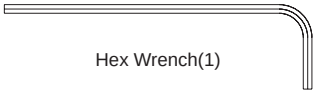
Decal(1)

AS6241 Canopy


Canopy(1)

2x5mm
Wood Screw(3)

PE0009 Hardware Set


Hex Wrench(1)

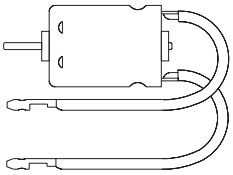

EZ Connector(2)


M2 Nut(2)

3x3mm Set Screw(2)

M2 Washer(2)

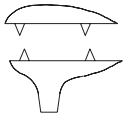
AS6242 Motor


380 Motor(1)


Capacitor(2)

2.5x5mm Screw(2)

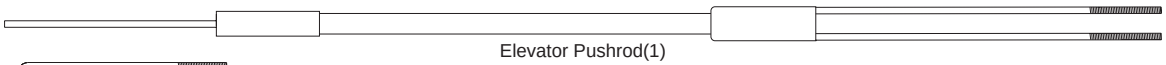
AS6243 Control Horn

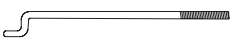

Backplate(2)
Control Horn Base(2)

2x22mm Screw(2)


Nylon Horn(2)

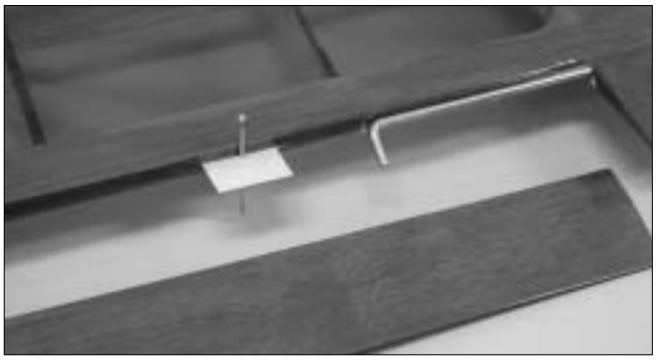
AS6245 Pushrods


Elevator Pushrod(1)


Aileron Pushrod(2)


Clevis(4)

Wing Assembly 主翼的安裝步驟

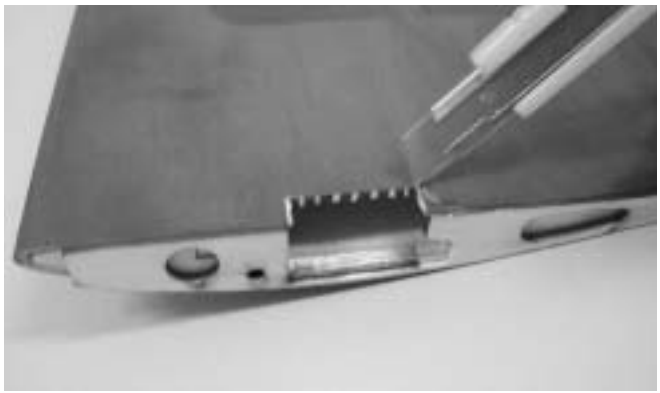


1. Locate CA Hinges and use pins to center the hinges in place.

   固定活頁，在活頁中央使用大頭針穿過定位。

2. Install the aileron and remove all pins then apply thin CA to all hinge areas.

   安裝副翼拔掉所有大頭針，在活頁的部份點上一些瞬間膠。

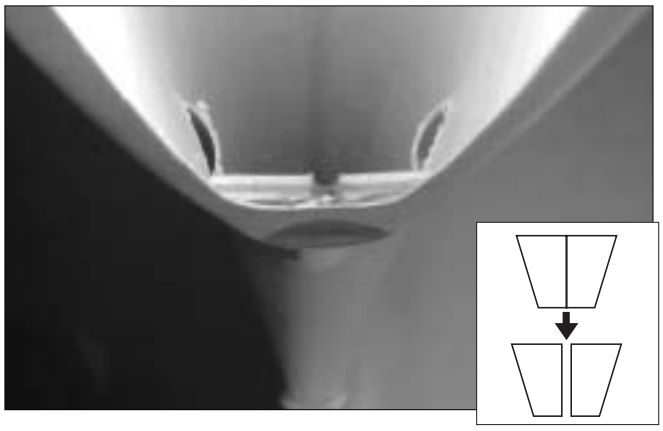


3. Remove the portion of center wing rib to allow clearance for aileron servo. Repeat the same process on the other wing .

   將主翼要安裝副翼伺服機座的位置切割出來，同樣的工作在另一片主翼上再做一次。

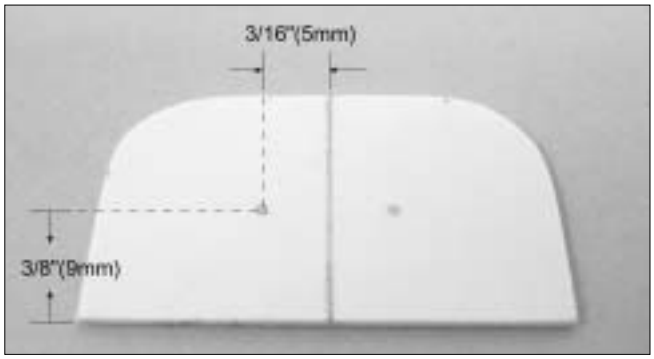
4. Trial fit two wing halves with Wing Join Wire. When satisfied, apply epoxy to two center wing ribs then accurately aligned and firmly press with each other until it cured.

   先將主翼中置入補強條再將兩邊主翼試裝看看、確認沒有問題後，使用AB膠接合，接合時需在接合面施以適當壓力直到AB膠硬化固定。



5. Cut plywood Wing Mount into two pieces with hobby knife. Trail fit the wing mounts in fuselage. Sand the glue area in fuselage to enhance adhesion. Upside down the fuselage then glue wing mounts in place with epoxy.

   用美工刀將合板製的主翼固定板切開、與機身試組合，在機身的接合部份以砂紙磨粗表面以增加黏著力，使用AB膠將固定板固定在機身。



6. Mark a centerline and wing mounting holes on Wing Protector as shown.

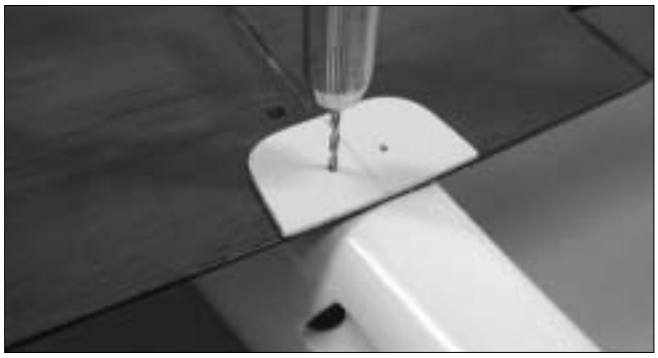
如圖所示在主翼固定保護板畫出中心線及固定螺栓孔位。

7. Place wing protector on the main wing and make sure it is centered and level with trailing edge. Use fine tip marker to make mark along the wing protector.

將主翼固定保護板置於主翼上，兩者中心線的位置需重疊對齊、並與後緣切齊，然後延著固定保護板外緣做記號。

8. Use hobby knife to cut away the covering inside the line about 1/8"(3mm). Be carefully do not hurt the wood structure.

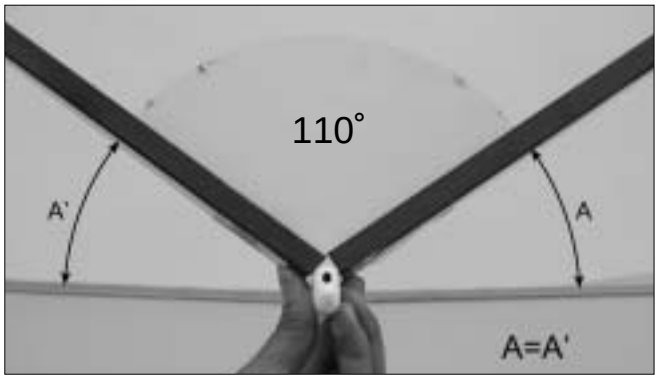
使用銳利的美工刀延著做記號的部份預留3㎜左右將包覆紙去除，須小心勿傷及木質的部份。



9. CA the wing protector. Trial fit the main wing onto the fuselage, then drill 3/64"(2mm) holes at the marks you drew before. Secure the main wing with furnished wing mounting wood screws.

使用瞬間膠將保護板固定在主翼、之後將機翼裝置在機身上，確定主翼位置之後在機身主翼固定板的位置上鑽2㎜的孔、鎖上固定螺絲。

Tail Installation 尾翼的安裝步驟



10. Trail fit two tails to the fuselage, sand it if necessary. Epoxy the tails as shown, use furnished template to make sure the two tails is angled 110-degree.

先在機身試裝尾翼，如果有需要用砂紙做細部修整，如圖所示使用AB膠固定尾翼然而必須先使用內附的模板確認兩片尾翼角度為110度、並需注意兩邊外角必須相等。

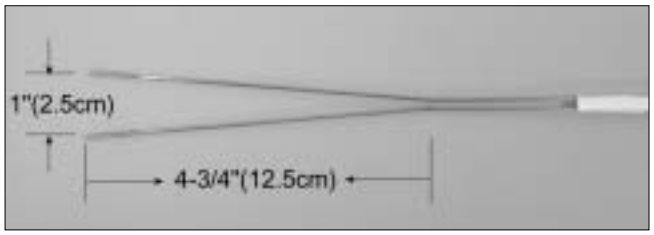
11. Locate Elevator Control Horn (Back Plate, Control Horn Base, 2 x 25mm Screw, Nylon Horn).

    Position Back Plate on elevator then drill 3/64" (2mm) holes.

    在升降舵控制面鑽2mm的孔，安裝升降舵、舵角控制器。

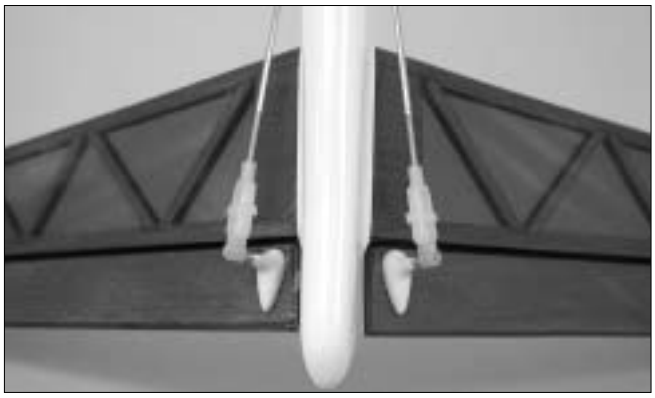
12. Secure and install the control horns as shown.

    如圖示確實的安裝升降舵、舵角控制器



13. Locate the Y Pushrod then bend the wire as required in the photo.

    將Y型連桿折成像照片中一樣的角度

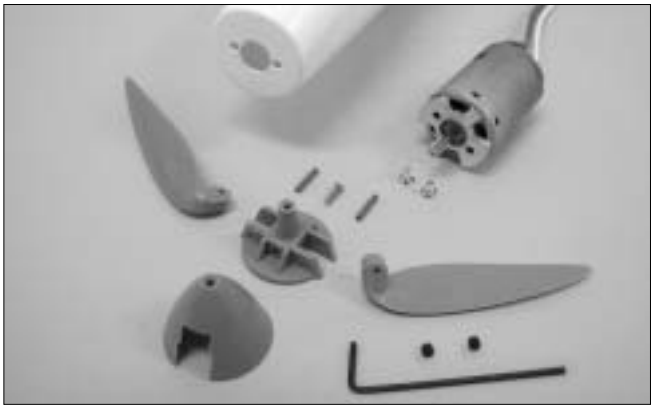


14. Insert Y Pushrod through fuselage and exit two ends at two pushrod exit holes. Thread Clevises on two threaded pushrod ends then connect to the elevator control horns. Slice two pieces of furnished tube then apply on clevises to prevent clevis snapping off when in flight.

    將Y型推桿置入機身從機身尾部兩側穿出、並連接在升降舵控制桿上，切一小段內附的矽膠管套在塑膠拉桿頭上、以防止飛行時脫落。

Motor / Prop Installation

馬達以及螺旋槳的安裝步驟



15. Locate Motor, Motor Mount, Folding Prop and Screws as shown.

    安裝馬達、馬達座、摺疊式螺旋槳、螺絲如圖所示

16. Apply very very little CA glue to keep motor mount on motor. Be careful do not apply any glue at mounting holes and motor shaft. Trail fit motor in fuselage, sand the contact area if necessary. When satisfied, apply very thin epoxy on motor mount then secure motor in fuselage with two 2.5 x 5mm Sink Screws.

    使用非常少量的瞬間膠將馬達座黏在馬達上、但是必須小心不能將馬達驅動軸給黏住，試著將馬達裝上機身、如有必要再以砂紙做修整，當確定沒有問題之後、在馬達座與機身接合面塗上一層薄薄的AB膠，再鎖上M2.5×5的固定螺絲。

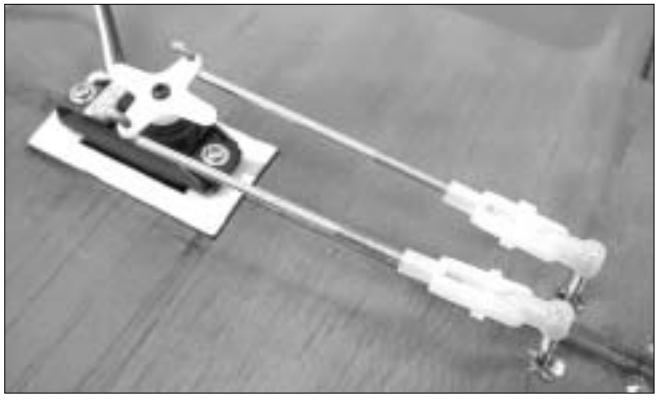
17. Install the Folding Propeller. Make sure there is 1/16"(1.5mm) clearance between back plate and fuselage.

    安裝摺疊式螺旋槳，螺旋槳固定座與機身須保持1.5mm的間隙。

Servo Installation
伺服機的安裝步驟

18. Locate Aileron Servo Tray, cut away the covering then glue the servo tray and install the aileron servo.

    安裝副翼伺服機座，副翼伺服機座要安裝的地方，多餘的包覆紙必須切除、再用AB膠固定在主翼上，最後鎖上伺服機。



19. Install the nylon horn to aileron torque rod. Thread clevis to pushrod then connect the clevis to nylon horn. Z-bend the pushrod at the proper position then connect to the servo horn. You will have to remove the servo horn from the servo to do this step.

    副翼拉桿裝上連桿頭之後將連桿頭銜接上副翼控制桿上，在拉桿適當長度的位置以Z字鉗折出Z字型用以連接伺服機控制片。

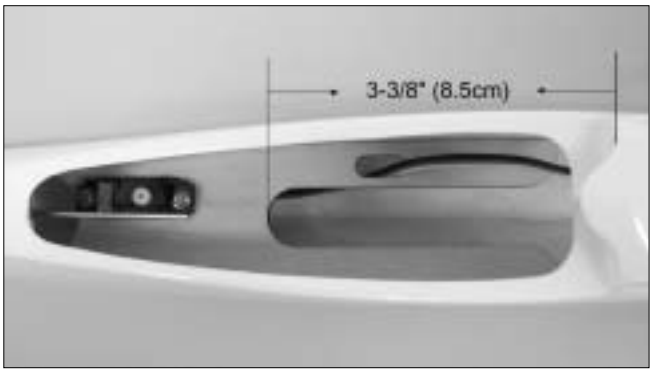
    Enlarge the servo horn holes for pushrod to go in might be necessary.

    Adjust the clevises when servo in neutral position, apply tube to hold clevis in place when satisfied.

    必須加大伺服機片的孔徑使拉桿可以順暢動作，並在連桿頭上裝上一小段耐熱油管。

20. Secure the elevator servo on the servo tray as shown.

    如圖所示將昇降舵伺服機確實的鎖在伺服機座上。



21. Glue the servo tray in fuselage with CA as required position.

    將伺服機座安裝於機身內用瞬間膠固定

22. Install EZ Connector on servo horn.

在伺服機片上安裝拉桿快速接頭。

23. Insert the pushrod through the EZ connector, make sure elevator is level with the tail then secure the servo horn and set screw when servo is in neutral position.

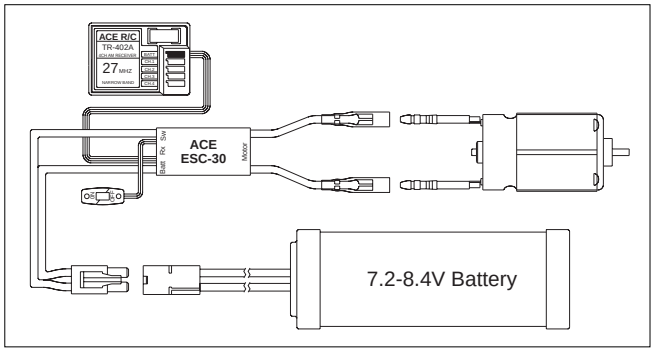
將升降舵拉桿與拉桿快速接頭連接、確定升降舵與尾翼是水平狀態、伺服機在中立點的位置，固定伺服機控制擺臂與拉桿快速接頭螺絲。

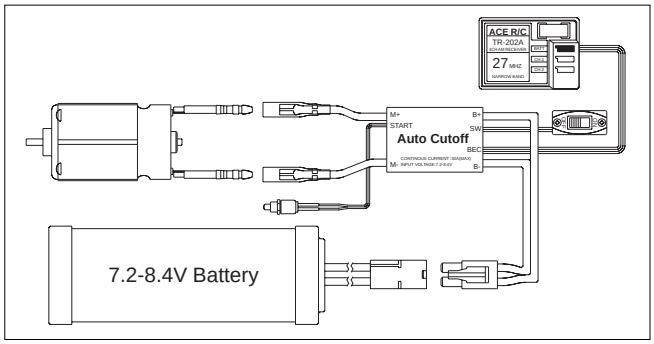
24. Locate Vecro and cut it into two pieces. Attach the vecro to battery pack and attach the other halves of vecro to the fuselage as shown.

將魔術帶剪成兩段，分別固定在機身與電池上如圖所示。

25. Refer to manufacturer's Receiver and ESC manual then connect all connectors properly. The ESC and RX are located between battery and motor. You might need two servo extensions at this step. Install the switch on fuselage as shown. Thread the antenna though fuselage and explode at least 5"(10cm) in length out of of fuselage.

參考接收機與ESC的說明書正確連接所有的接線，接收機與ESC是裝置在電池與馬達之間，用二條伺服機延長線連接伺服機與接收機，電源開關裝在機身上面如圖示，接收機天線須穿過機身露出至少20公分。





26. The attached two pictures are the examples for using ESC-30 and auto cut-off.

這兩張圖例是使用速控器及自動斷電開關連接的示範。

Canopy Installation

座艙罩的安裝步驟

27. Trim the Canopy alone with the molded line. Cut a hole at front top canopy so air could go in to cool motor and battery when in the air.

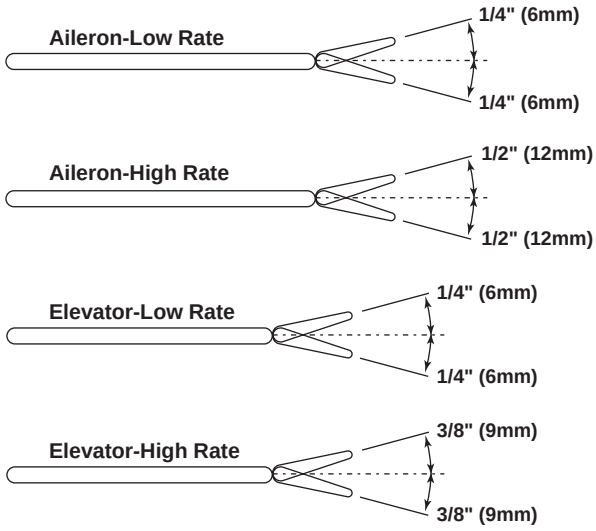
沿著預留線剪下機艙罩，機艙罩前方的散熱孔必須剪下使空氣進入用以冷卻馬達及電池。

28. Position the canopy in place. Drill three 1/16" (1.5mm) holes then secure the canopy with furnished 2 x 5mm Black Wood Screws.

在機艙罩及機身鑽三個1.5mm的孔，並以M2×5的自攻螺絲固定機艙罩。

Control Throws

These control throws are merely a starting point for your radio setup and can be tailored to fit your flying style.

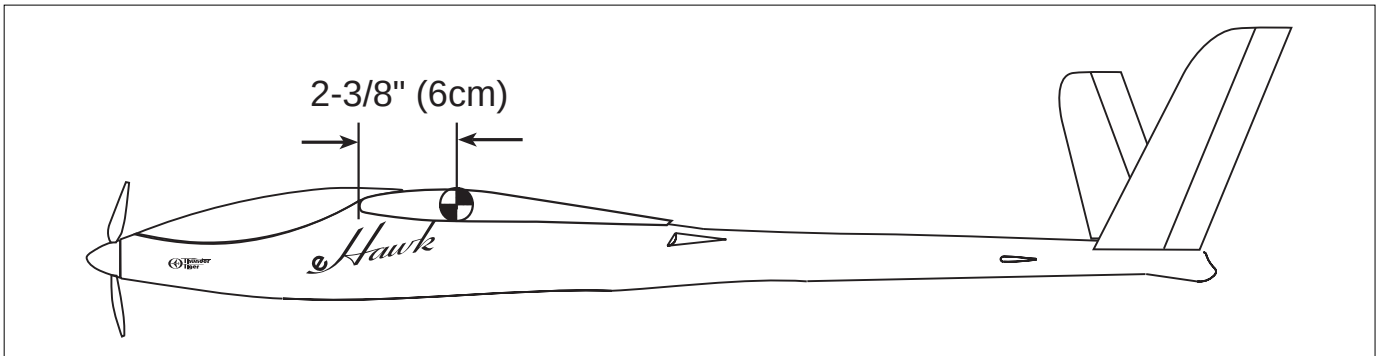


Balance

平衡步驟

29. Balancing your model is very important and must not be overlooked. The center of gravity (CG) is 2-3/8" behind the leading edge of the wing near the wing root. You can adjust the battery pack forward or backward to reach the right CG.

機體的重心平衡是非常重要的一件事，本產品的重心位置自翼根處沿著機身距主翼前緣約2 3/8" (約60mm）的位置，您可以藉著調整電池位置來找出正確的重心。



FIRST FLIGHTS

Checks You Should Make

Before you attempt to fly your model you should perform some final checks:

1. Fully charge your radio and flight batteries following the manufacturers instructions.

2. Check the direction of travel of your control surfaces and the operation of the motor controller per the manufacturers instructions.

3. Range check your radio system per the manufacturers instructions.

4. Double check that you have installed the screws in the servo control arms and that the clevis are snapped tightly on the control horns.

We strongly recommend that you get help from an experienced R/C pilot to learn to fly if you are just beginning. You should be able to find help at your local dealer or club field.

Flying Your E-Hawk

First of all, if you are flying with other flyers, check to make sure they are not operating on the same frequency as you. If they are, do not turn on your radio until they have safely landed and have turned their radios off.

Secondly, even though the E-Hawk is very easy to fly, if you are a novice modeler/pilot, we highly recommend that you seek the help of an experienced modeler for your first few flights. He can save you a lot time and possible disappointment by helping you get your model in the air safely and getting it trimmed out for you.

Important: The radio control system is set up to operate the control surfaces just like a real airplanes as if the pilot (you) are sitting in cockpit controlling the airplane. When you want the plane to dive, you push the elevator stick forward (up), to climb you pull the stick back (down), to turn right, you move the aileron stick to right with elevator up and visa versa. When you want to turn the motor on you push the throttle stick forward and when you want to turn the motor off you pull the stick back. It is the turning that causes the most problems with novice pilots because when the plane is flying towards you a right turn command on the transmitter cause the plane to turn to your left (which is the planes right). Get the picture? Fortunately the up and down commands do not change. The easiest way to conquer this problem is to try and always face your body near the direction the planes is flying. This means that you will have to look over your shoulder at times, but many modelers find this an easy way to learn.

THE FIRST FLIGHTS

You should always use the first few flights to get accustomed to your new airplane and its flying characteristics. Keep the model upwind and climb to a good comfortable altitude to cut off the motor and trim your E-Hawk for a glide. At altitude cut the motor and start your glide. Have an experienced modeler adjust the trims of the transmitter for you until the plane will glide straight and level without any other control input. Once the trims are set practice making smooth turns in both directions while losing as little altitude as possible. When the E-Hawk starts to get too low for comfort turn the motor back on and climb back up to altitude. Practice this climbing and gliding until you are comfortable with the airplane.

Depending on the battery you use the E-Hawk will make 2 to 3 good climbs up to a nice thermal searching altitude from single battery charge. Once the Auto Cut-off Device or ESC shuts off the power to the motor you will need to set up for your landing. Continue to make smooth gently turns while lining up the E-Hawk with your landing strip. Once you are set up to land keep the wings level and let the model settle in for an nice gentle landing while adding up elevator to keep the nose up slightly as the plane slows down. Make several flights like this to really familiarize yourself with the characteristics of your model and to learn the glide and distance covering abilities of the E-Hawk. Once you have mastered a good “comfort level” you are ready to start searching for thermals which will really increase your flight times.

Safety Precautions

You as the pilot of this radio controlled model are responsible for any accidents that may occur during its use. We recommend that you fly your model at a model club field which is specially set up for model flying. But always be sure that you operate the model in a safe and careful manner and observe the

Following Suggestions:

1. Do not fly your model close to buildings, power lines, roads, or other obstacles.

2. Do not fly in congested areas . Select wide, flat and open area to fly with no obstructions and plenty of room for learning to fly.

3. Do not fly without help from an experienced model pilot until you have learned how to fly. Your local model club or hobby shop can recommend an instructor if you do not already know one.

4. Always check for other modelers in the area and be sure that your frequency is not in use by someone else which might cause you model to crash. Always observe frequency control systems at flying fields and wait your turn to fly.

5. Never fly your model directly toward spectators, autos, other modelers or their models.

6. Always abide by the rules for model flying provided by your club and the governing agency for model aircraft in your country.

Congratulations

Now that you have completed the assembly of your E-Hawk model we feel that have a very capable and good looking 1.4-meter electric sailplane. We hope that you will enjoy this model and get many hours of flying pleasure from its use. Thank you for purchasing this E-Hawk from Thunder Tiger and we look forward to providing you with other great R/C products in the future.

Launching & Landing

Launch firmly into wind straight and level. Do not throw upwards or the plane will stall and crash!