



3D Profile EP



No. 4316 EXPO 3D Profile EP

* Wing Span: 31.5" (800mm) * Length: 32.17" (817mm) * Wing Area: 252.3 sq.in. (16.28dm²)
* Weight: 9.3 oz. (265g) * Motor: 370 with 6: 1 Gear * Radio: 4 CH, 3 Micro Servos Req ' d

No. 4317 G202 3D Profile EP

* Wing Span: 31.5"(800mm) * Length: 32.87 (835mm) * Wing Area: 258.5 sq.in. (16.68dm²)
* Weight: 9.3 oz. (265g) * Motor: 370 with 6: 1 Gear * Radio: 4 CH, 3 Micro Servos Req ' d

No. 4318 Christen Eagle 3D Profile EP

* Wing Span: 30.7"(780mm) * Length: 30.9" (785mm) * Wing Area: 369.8 sq.in. (23.86dm²)
* Weight: 10.5 oz. (300g) * Motor: 370 with 6:1 Gear * Radio: 4 CH, 3 Micro Servos Req ' d

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. Contact Thunder Tiger authorized agent if you find any problem or need tech support.



INTRODUCTION

All of us at Thunder Tiger want to thank you for choosing the 3D Profile EP series.

The 3D Profile EP series includes Expo 3D, G202 and Christen Eagle. These are the latest developments in small 3D aerobatic EP design and engineered to go together quickly and easily while still providing you with great looks and exceptional flying performance.

The 3D Profile is good for those pilots who are interested in learning 3D-aerobatics or for those experienced 3D pilots looking for a relaxed practicing plane that can be used both outdoor or indoor.

Thunder Tiger guarantees that you should enjoy the trouble free use from our R/C products. Thunder Tiger products have been sold worldwide through the authorized distributors that are supported directly and rapidly from Thunder Tiger. You may find that Thunder Tiger is always pursuing to explore new items creatively with highest quality. To update the latest product information and to get the best technical support, please fee free to contact your local hobby shops or Thunder Tiger authorized distributor.

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PRE-ASSEMBLY NOTES

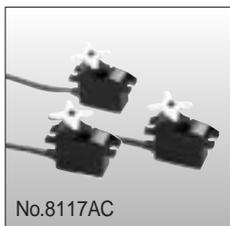
1. This manual is for 3D Profile EP series including Expo 3D, G202 and Christen Eagle. The photos shown in the assembly steps may not show all three kinds of plane as they are in the same manner of assembly. If you encounter any assembly question, you may contact Thunder Tiger authorized distributors or write email to Thunder Tiger directly for tech support.
2. These 3D profile EP are for experienced R/C pilot orientated and not for novice or entry level pilot. If you are not an experienced pilot, please get a fully competent pilot to help you to learn. This will avoid potential damage of your model as this series are made of PSP board which is easily broken if heavy landing or crash.
3. Please assemble your model exactly according to the instruction. Do not attempt to modify or change in any way as doing so may adversely change its flying characteristics.
4. Before you begin please check the entire contents of this kit against the part drawing to be sure that no parts are missing or damaged. This will also help you to become familiar with each component of your plane. If you find any of 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.

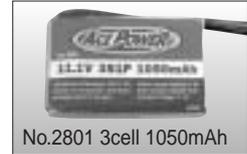
OTHER ITEMS REQUIRED

Radio: You will need at least a 4 channel radio control system with 3 sub-micro servos and mini receiver on an aircraft frequency for use in your 3D profiles EP.

ESC: We recommend a quality Speed Controller for this plane like Ace ESC-10 is recommended.



Lipoly Battery: Suggest to use Quality 2~3-cell Lipoly battery instead of any other NiCd or NiMH battery pack. The advantage of Lipoly battery is much lighter than the traditional Nicd or NiMH battery pack of the same capacity. Thunder Tiger provide high performance Ace Power Lipoly Battery which is at true discharge rate at 13C that most 3D pilots are looking for. The 2-cell Li-Poly battery is for normal flight yet 3-cell is good for 3D aerobatics.



Lipoly Charger: You will need a performance Lipoly battery charger to charge your Lipoly battery either at flying field or home. Always pay high attention when you're charging the Lipoly battery. Get a charger with alarm system and computerized charger with LCD screen that shows charging status. This will help you monitor the battery easily and safely.

Extension Wire: You will need a short extension wire for aileron servo.

MOTOR CARE

The included Super 370 motor is designed for 2~3-cells use yet we recommend you break-in the motor properly to extend the life of the motor. The following are some tricks :

1. Drop some oil on both bushing at the end caps of motor.
2. Break-in the motor for couple minutes at about 4.8 V without loading.
3. Apply oil after every 5 flights for best performance.
4. Do not fly continuously without letting motor have chance to cool down. This will hurt motor badly. Make sure motor is cool before you perform next flight.
5. Motor Heat Sink will help cooling and you can get this heat sink at any hobby shop.

OBL: Thunder Tiger OBL outrunner brushless motor 29 series is available for upgraded power. For more information please browse website at www.thundertiger.com



TOOLS AND SUPPLIES NEEDED

- Mixing Stick for Epoxy
- Rubbing Alcohol
- Paper Towels
- Hobby Knife
- Ruler
- Pen, Pencil or Maker
- Small Screw Drivers

Open the box and check that you have all the parts as shown below. If anything is missing please contact your dealer. Parts shown in this page are vary in foamy and linkeg sets of each kit.

AS6350 Foamy Set Expo 3D

Main Wing (1)
Horizontal Tail (1)
Rudder (1)
Triangle Balsa Wood (2)
Tape (1)
Fuselage (1)
Double Side Tape (1)
Velcro (1)
Tail Skid (1)
Wheel Pant (2)
Square (2)

AS6351 Foamy Set G202 3D

Main Wing (1)
Horizontal Tail (1)
Rudder (1)
Triangle Balsa Wood (2)
Tape (1)
Fuselage (1)
Double Side Tape (1)
Velcro (1)
Tail Skid (1)
Wheel Pant (2)
Square (2)

AS6352 Foamy Set Christen Eagle 3D

Upper Wing (1)
Lower Wing (1)
Horizontal Tail (1)
Wing Support (2)
Rudder (1)
Fuselage (1)
Triangle Balsa Wood (2)
Tape (1)
Double Side Tape (1)
Velcro (1)
Tail Skid (1)
Wheel Pant (2)
Square (2)

AS6359 Linkage Set (Expo 3D, G202)

Rudder Pushrod (1)
Elevator Pushrod (1)
Aileron Pushrod (2)
Clevis (4)

AS6363 Linkage Set (Christen Eagle)

Rudder Pushrod (1)
Elevator Pushrod (1)
Aileron Pushrod (2)
Aileron Linkage Rod (2)
Clevis (4)

PART DRAWINGS

Parts shown in this page are same for all 3D Profile EP planes.

AS6360 Landing Gear

Landing Gear (1)

2x5 mm Washer Screw (2)

Mount (1)

Retainer (2)

AS6355 Drive Shaft

Spur Gear/Drive Shaft (1)

Pinion (1)

E Clip (1)

No. 3549 11x 8 SF Propeller

Propeller (1)

AS6361 Decal

Decal (1)

AS6336 Wheel

Wheel (2)

AS6354 Spinner

Rubber Spinner (1)

M3 Nut (2)

Prop Washer (1)

AS6358 Control Horn

Control Horn (4)

Back plate (4)

AS6357 Super 370 Motor

Motor (1)

AS6356 Motor Mount

Motor Mount (1)

Mounting Strip (2)

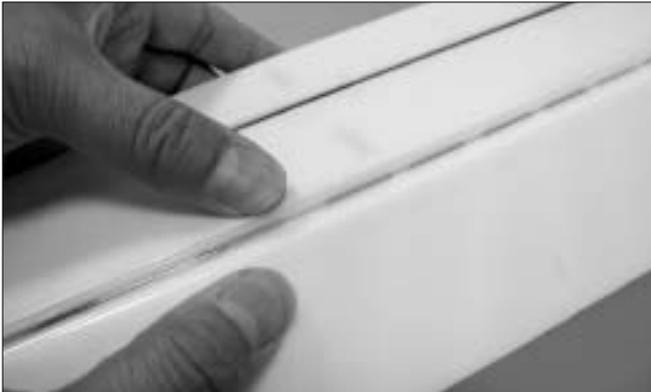
Washer (2)

Bearing (2)

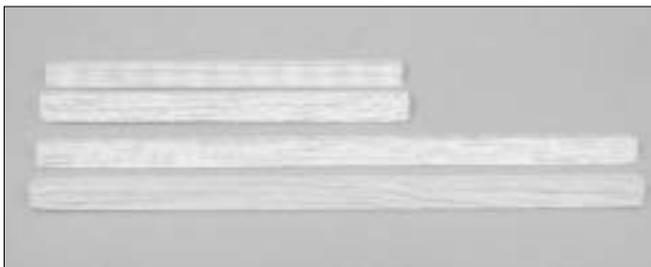
3 x 5mm Machine Screw (2)

2 x 8mm Self-Tapping Screw (4)

ASSEMBLY



1. Check all pre-hinged aileron and elevator, lightly press the taped area and make sure the aileron and elevator will not come apart. You will also have to check this before and after each flight to get precise throws for better performance.



2. Cut triangle balsa wood as indicated length which is going to reinforce the main wing later and keep the rest wood for elevator.

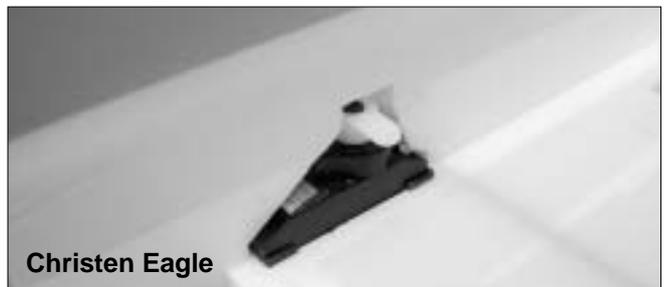
Expo 3D: 13.5cm; 6.5cm (5-1/4", 2-1/2")

G202: 13cm; 8cm (5-1/8", 3-1/8")

Christen Eagle: Lower Wing-1cm;9.5cm (3/8", 3-3/4")
Upper Wing- 11cm (4-1/4")



3. Get the furnished servo tape 3/16"x 1/2" (5x12mm) and place as shown.

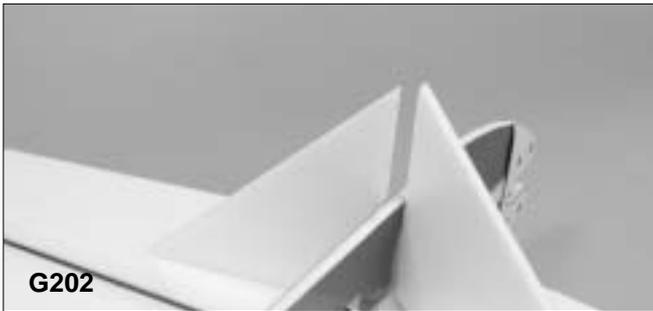
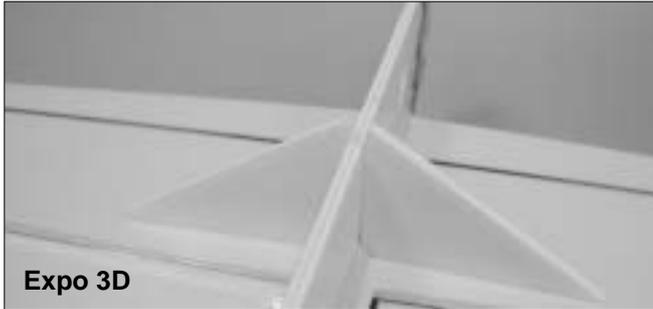


4. Note the orientation of servo output shaft and install aileron servo on the wing first. Do not glue the wing before you install the aileron servo. Next connect the servo wire to RX and turn on radio to make sure the servo rotating direction is correct. Secure the servo horn with the screw which comes with the servo. Now you can center and epoxy the main wing in place. Reinforce wing with triangle Balsa wood. Note the servo wire should go right side as RX and ESC will be installed at right side of fuselage later.

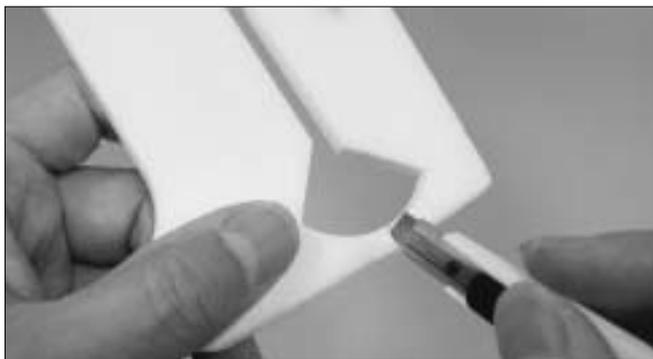


5. For Christen Eagle owner
Locate wing support and epoxy the wing support and upper wing in place as shown.
It will be easier if you place the airplane up side down to apply epoxy at the joints.

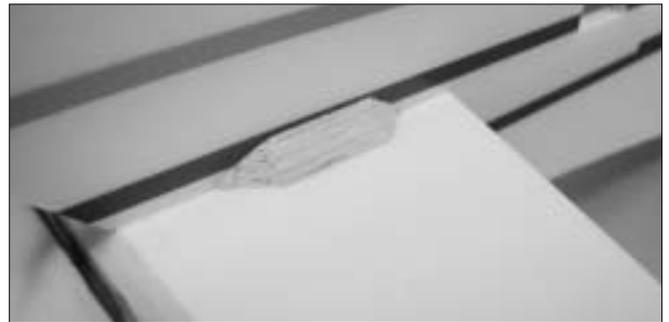
ASSEMBLY / TAIL



6. Use furnished square and make sure wing is perpendicular to the fuselage while gluing wing and fuselage together.



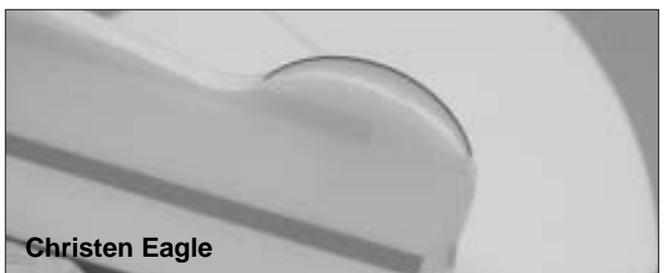
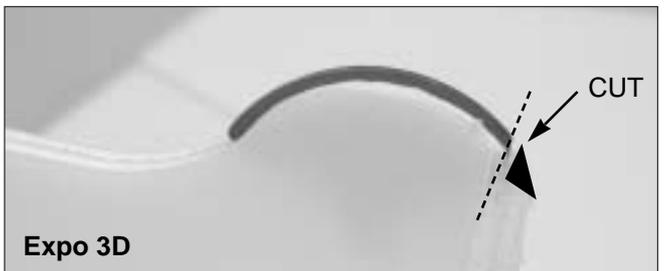
7. For Expo 3D and G202, it is necessary to cut fuselage tail so the horizontal fin could go in.



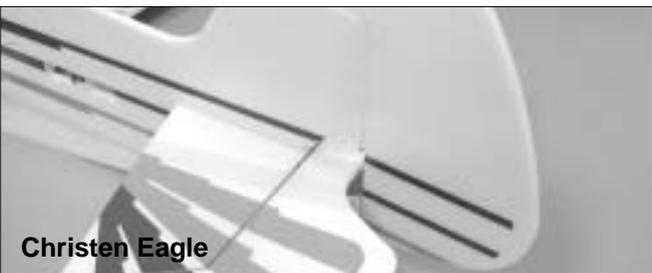
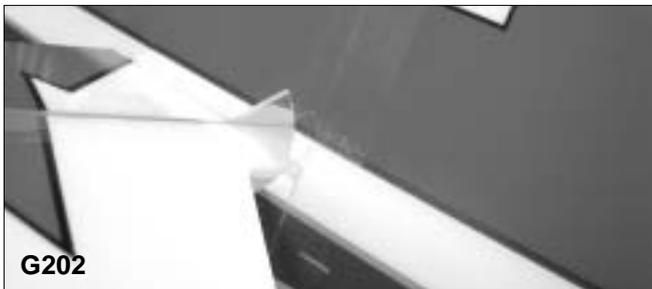
8. Epoxy the tail in place. You may use the rest triangle balsa wood and epoxy it at the bottom of horizontal tail.



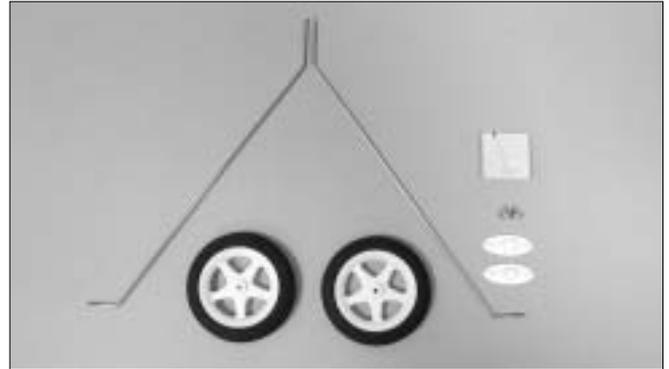
9. Locate the tail skid, next use hobby knife to cut a slot at the bottom of fuselage tail. Then insert the tail skid in place.



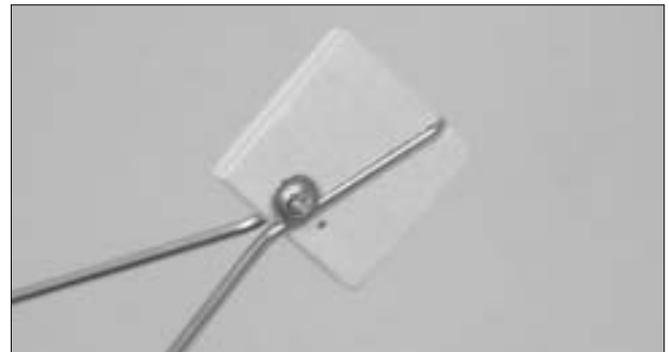
10. Glue the tail skid in place as shown. For Expo 3D, you may need to cut one end of skid so it will not have any influence to rudder movement.



11. Use the furnished tape to tape the Rudder in place. Tape the left side first then the right side.



12. Locate landing gear parts and wheels as shown.



13. Secure the landing gear on plywood with furnished 2 x 5mm washer wood screws.

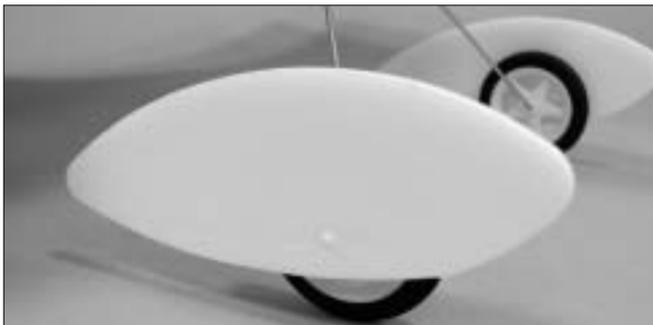


14. Epoxy the landing gear assembly in the hollow square area.

ASSEMBLY / SERVO



15. Install wheels by threading the wheel pant retainer in proper position.



16. Epoxy the wheel pants on the retainer. Make sure two wheel pants are parallel.



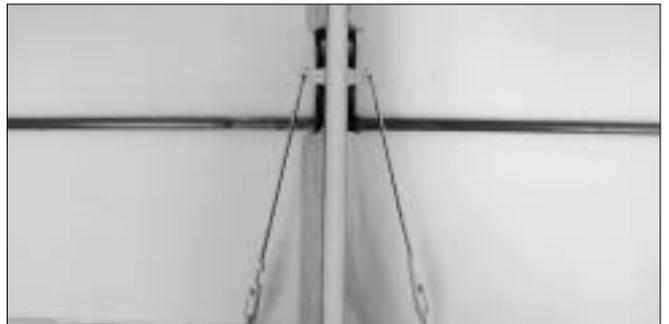
17. Install rudder control horn, slowly insert the control horn to avoid any damage of surface at the other side.



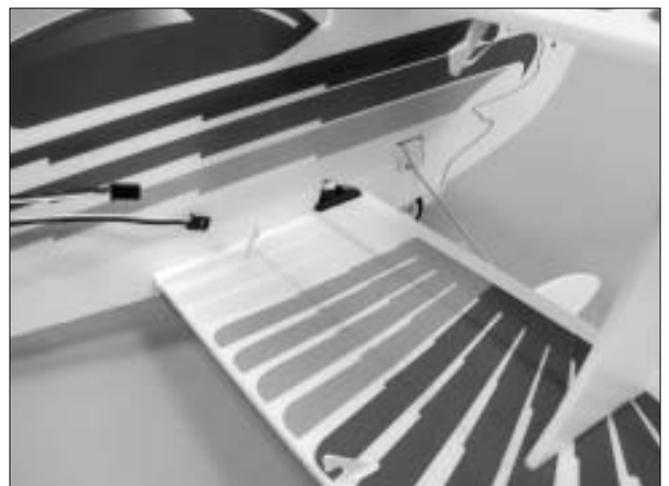
18. Press and lock the control horn by the backplate. Note the orientation of the backplate. Apply tiny of epoxy will help secure the control horn in place firmly.



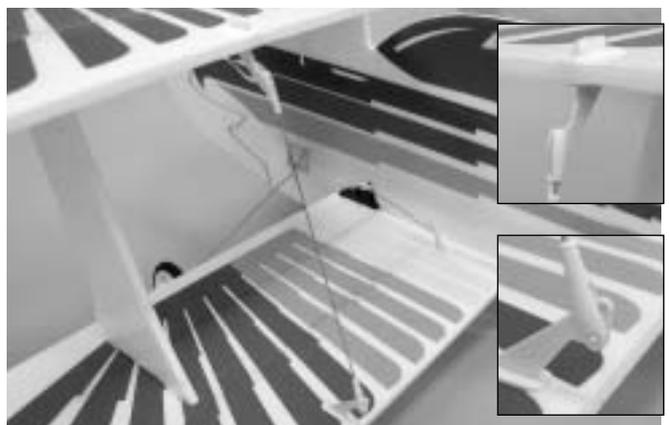
19. Install aileron control horns.



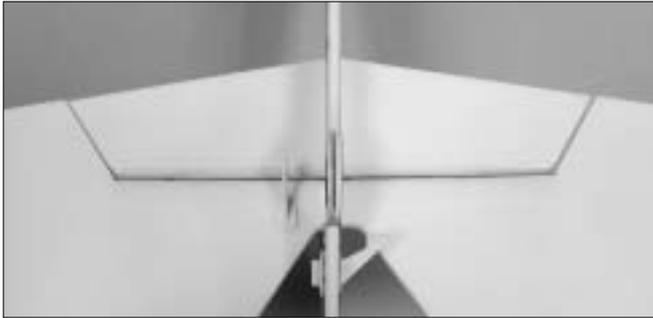
20. Install aileron pushrods as shown.



21. For Christen Eagle owner, please install control horn on two wings for aileron linkage.



22. Locate aileron linkage rod and thread clevises on two ends. Snap the clevis on the lowest hole of the control horn for best control throw.



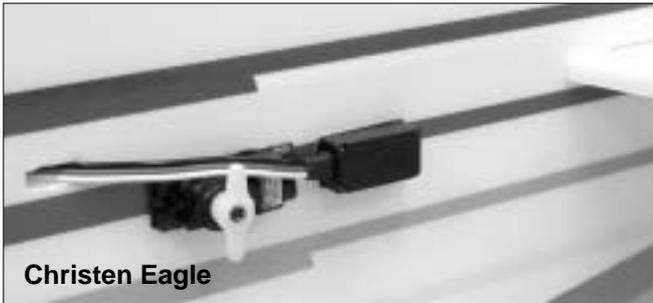
23. Use the same way to install control horns for elevator and rudder.



Expo 3D



G202



Christen Eagle

24. Install rudder and elevator servo note the orientation of servo output shaft. Above photos shown are all at left side.



Expo 3D



G202

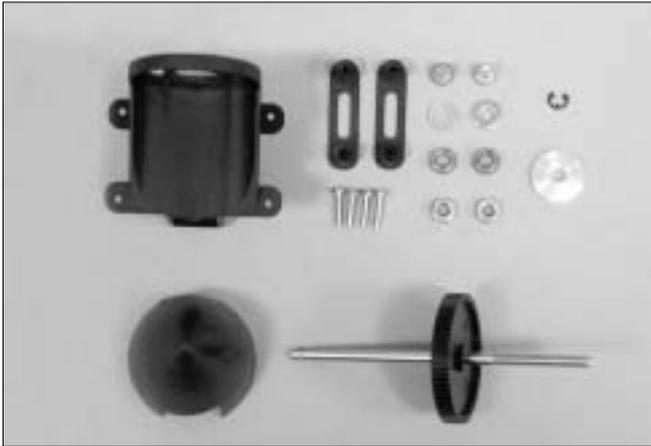


Christen Eagle



25. Install the elevator and rudder pushrods when servos are in neutral position and make sure rudder and elevator are even with the vertical fin and horizontal tail respectively.

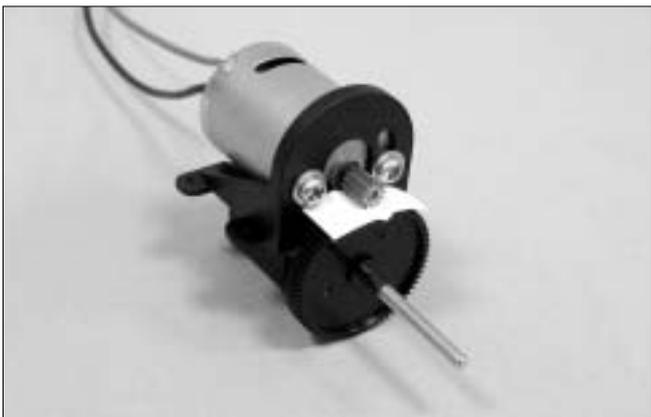
ASSEMBLY / MOTOR



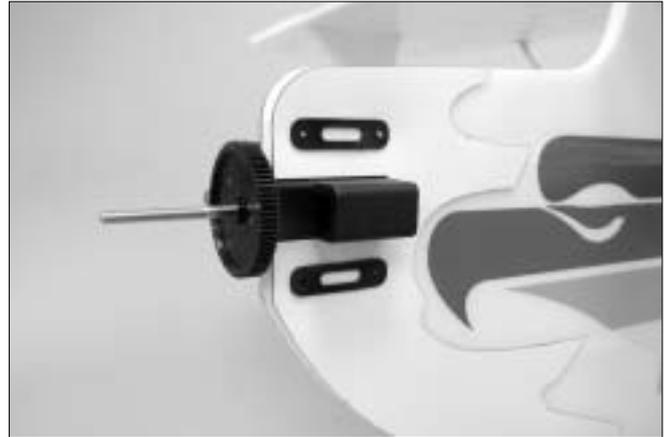
26. Locate all the parts of universal power unit.



27. Press the bearings all the way in then insert the Spur Gear Drive Shaft. Snap on the E clip. Try pull the drive shaft and make sure E clip is well positioned and drive shaft will not come off.



28. Install the motor in the power unit. To get good gear mesh, use a piece of thin paper and set between the pinion and spur gear. Then secure the motor tightly with 3x5mm machine screw and washer. Remove the paper by rotating the gear.



29. Secure power unit on the fuselage with the mounting plates by four 2x8mm self-tapping screws. Drive shaft should be in line with the fuselage without any thrust angle.



30. Locate M3 nut, put it in the propeller then thread the propeller on the drive shaft. Next attach propeller washer and another nut. Secure it firmly and make sure to leave at least 6mm drive shaft for rubber spinner.

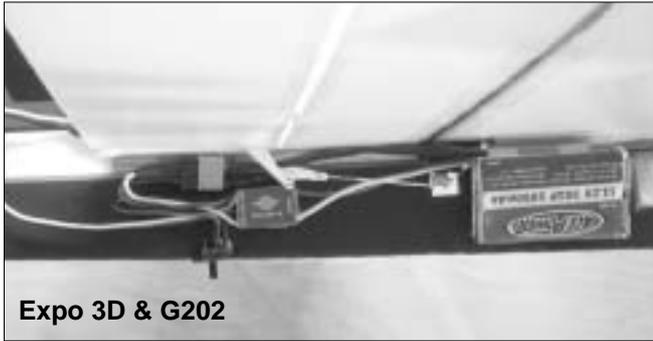


31. Install the rubber spinner on drive shaft properly and make sure it is not transformed.

CONTROL THROWS

The following control throw of 3D Profile EP is merely a starting point for your radio setup and can be tailored to fit your flying style.

For All three models the aileron and elevator are of the same throws but rudder are different as shown below.



Expo 3D & G202

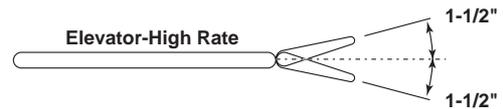
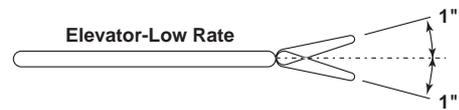
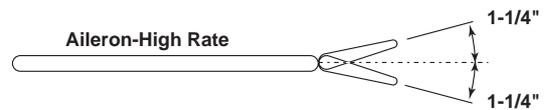
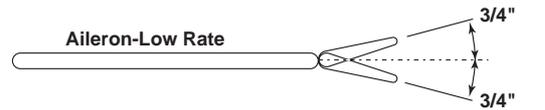


Christen Eagle

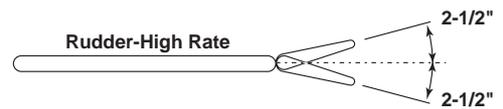
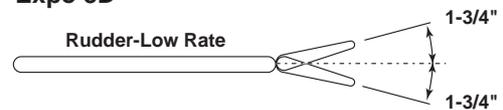
32. Connect the servo wires to receivers and speed controller as shown. You will need one servo extension to connect aileron servo. Use Velcro to secure battery as photo shown. Secure the RX and ESC with the furnished Double-Sided tape. Organize the wires and fix them on fuselage with tape if necessary.



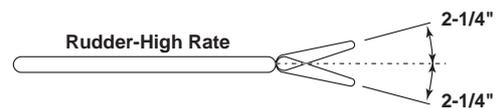
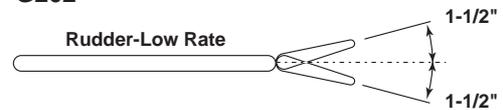
33. Route the antenna wire to the tail and tape it on fuselage.



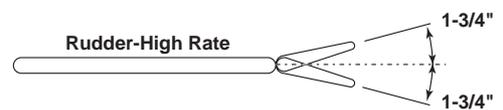
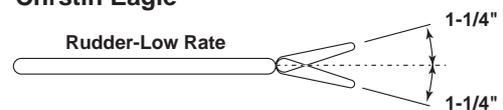
Expo 3D



G202



Christen Eagle

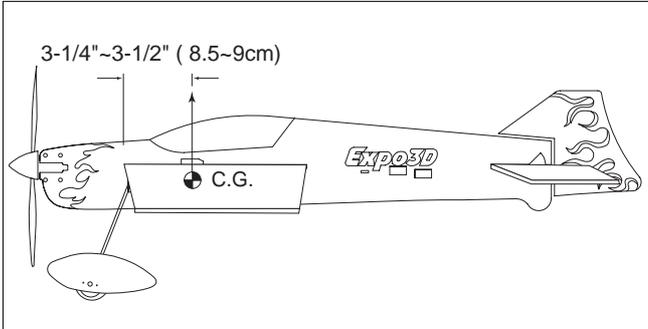


ASSEMBLY / BALANCE

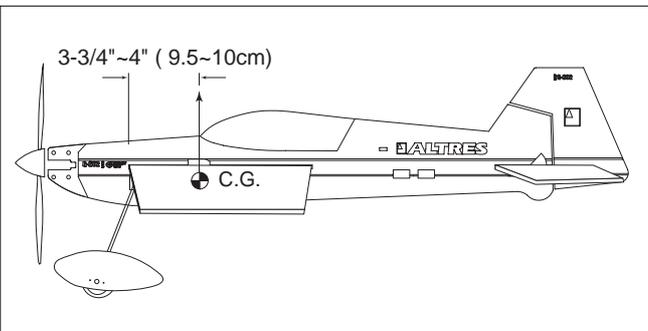
BALANCE

It is important to balance the plane to get correct CG before you fly.

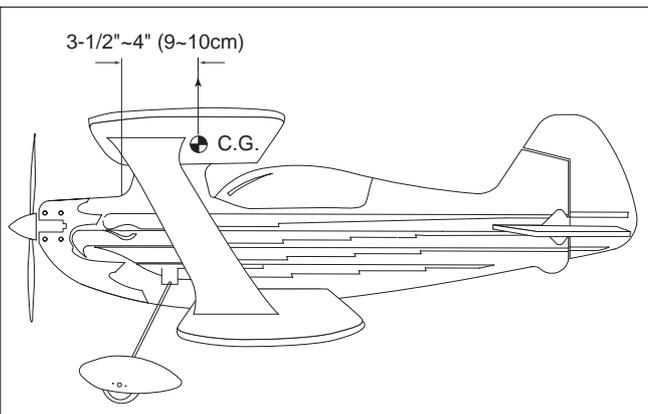
Balance Point as indicated in each diagram.



Expo 3D



G202

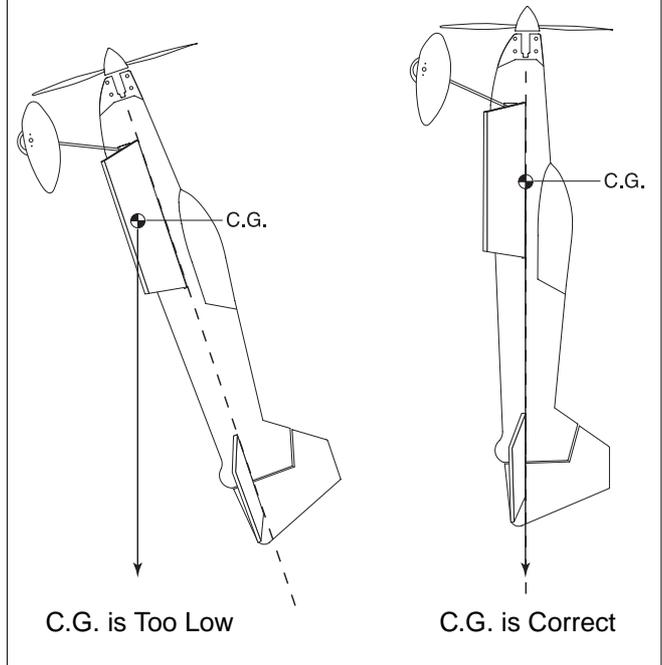


Christen Eagle

Note: For the best flight performance of the Christen Eagle, a high center of gravity is important. Following the manual shown in Step 32 which shows the location of battery.

LONGITUDE BALANCE

C.G. Must be Set on Thrust Line



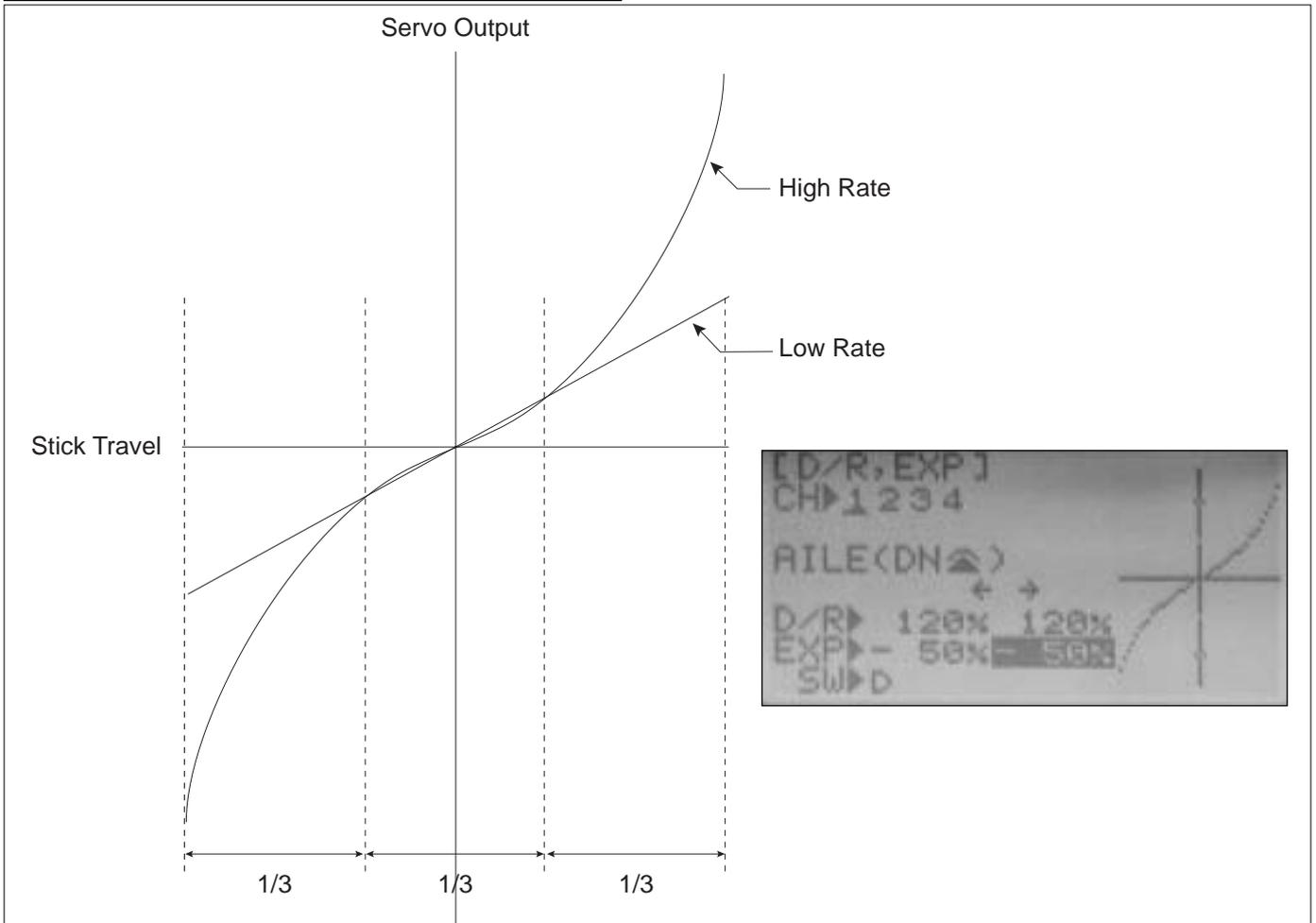
As 3D planes do a lot of hovering so it is very important to do longitude balance to make hovering much more stable. Try to create a small hole after the motor and on the thrust line. Get music wire or string then thread the wire through the hole. Make sure that model hangs perfectly vertical as illustration. If not then try to adjust the location of battery, receiver or ESC to get good longitude balance.

CONGRATULATIONS

Your done, may you have many successful flights filled with fun and lots of 3D maneuvers.

Thank you for purchasing this 3D Profile EP from Thunder Tiger and we look forward to providing you with other great R/C products in the near future.

SETTING UP FOR 3D FLIGHT



Exponential

To make your 3D flight successful, the most important is to set up your radio properly and fine-tune the exponential. We would suggest you use a computerized radio plus a big LCD screen that could show the exponential graph as the illustration. Normally this computerized radio has dual rates or even triple rates. Once you fly it fine with low rate in normal flight, next you will have to set up 3D rate.

We suggest the 3D-rate setting is same as low-rate setting around 1/3 of the total stick travel in the beginning. If you look at the graph, the middle section of 1/3 travel are most likely the same at low rate and 3D high rate. Beyond this middle section the 3D rate setting is far higher than the low rate.

Simulator A good tool to practice 3D easier is to fly simulator. One may say simulator is not realistic but this is not true. There are some simulators

available in the market and its scenery and performance are just like a real thing. For example, Aerofly Pro Deluxe USB version from Ikarus or Real Flight G3 from Greatplanes are all good simulators you can choose from.

Simulator is a must buy tool if you seriously want to fly 3D aerobatics. There is no genius or born 3D pilot, remember that practice makes perfect. 30 minutes a day on a simulator can help you do hovering, torque roll easily as well as other aerobatics. If you would like to be a good 3D pilot, flying everyday is necessary. The reaction to control the airplane will be more nature. As there is no time to think when you do 3D aerobatics.

Simulator practice might be perfect yet we suggest to do some actual flying as the supplemental so it will not go too far from the real thing as there are many things that you can not learn in the screen.

ASSEMBLY / 3D SETUP

CG

Normally the correct CG position is beneficial to hovering flight. Actually, for 3D profiles its CG range is pretty large. Just give enough control surface movement, softened correctly with exponential throws then you may control the plane at a large range of CG positions. Why, it is because no airfoil of the plane. The only force to keep it in air is the thrust.

Flying

Even though you set up the airplane, it needs to be setup and fine-tuned in the air. Always start on low rates when launch the airplane or take off of the ground. Once you fine trim the airplane in the air then tune the exponential setting, you will be able to fly it all the time on the 3D rates.

Once you got confidence to do hovering or do 3D aerobatics, we suggest you fly it near you. The closer the airplane, the better you can control the plane as you can see it very clear even if it has a slight movement. The other advantage is the lower or closer to ground, the less damage of the plane as it has less potential energy. It is useful for a dead battery or ESC cut off suddenly.



2004 Official AMA National Model Aircraft Safety Code

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 previously, 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) The maximum takeoff weight of a model is 55 pounds, except models flown under Experimental Aircraft rules.
- 5) 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.)
- 6) 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.

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 flier, unless assisted by an experienced helper.
- 3) 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 at or in the front of the flight line. Intentional flying behind the flight line is prohibited.
- 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) Flying sites separated by three miles or more are considered safe from site-to site interference, even when both sites use the same frequencies. Any circumstances under three miles separation require a frequency management arrangement, which may be either an allocation of specific frequencies for each site or testing to determine that freedom from interference exists. Allocation plans or interference test reports shall be signed by the parties involved and provided to AMA Headquarters. Documents of agreement and reports may exist between
 - (1) two or more AMA Chartered Clubs,
 - (2) AMA clubs and individual AMA members not associated with AMA Clubs, or
 - (3) two or more individual AMA members.
- 6) For Combat, distance between combat engagement line and spectator line will be 500 feet per cubic inch of engine displacement. (Example: .40 engine = 200 feet.); electric motors will be based on equivalent combustion engine size. Additional safety requirements will be per the RC Combat section of the current Competition Regulations.
- 7) 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.
- 8) With the exception of events flown under AMA Competition rules, after launch, except for pilots or helpers being used, no powered model may be flown closer than 25 feet to any person.
- 9) Under no circumstances may a pilot or other person touch a powered model in flight.