PHOENIX MODEL®

Instruction Manual

Diamond

ELECTRIC GLIDER ARF

SPECIFICATION

- **Wingspan:** 2020mm (79.5 in)
- **Length:** 1237mm (48.7 in)
- **Flying weight:** 1500-1600gr
- **Wing area:** 36 dm2
- **Wing loading:** 40-45 g/dm2
- **Wing type:** RG airfoils
- **Covering type:** Genuine ORACOVER®
- **Radio:** 6 channel – 6 mini servo: 2 aileron; 2 flap; 2 elevator (not included)
- **Propeller:** suit with your engine
- **Motor:** brushless outrunner 400-500W, 920 KV
- **Gravity CG:** 75-80 mm (3,1 in) Back from the leading edge of the wing, at the fuselage
- **Control throw aileron:** Low: 6mm right/left, 15% expo; High: 8mm right/left, 15% expo
- **Control throw Elevators:** Low: 6mm up/down, 12% expo; High: 8mm up/down, 12% expo
- **Experience level:** Intermediate
- **Plane type:** Sailplane

RECOMMENDED MOTOR AND BATTERY SET UP

- **Motor:** OS OMA-3810-1050 Or Xpower C3520/12 (not included)
- **Propeller:** 12x8 foilding (not included)
- **Lipo cell:** 3 cells / 2000 – 2400mAh (not included)
- **Esc:** 40-60A (not included)

TABLE OF CONTENTS

Introduction 1
Warranty.....2
Disclaimer.....2
Safety precaution 2
Important building notes.....2
Suggestion.....2
Flight warnings.....2
Flight warnings.....3
Covering tools.....3
Adhesives and required tools 3
Academy of model aeronautics national
model aircraft safety code.....3
Preparations.....5
Installing the ailerons.....5
Installing the aileron servos 5
Installing the control horns.....6
Installing the flap servo 7
Installing the flaps control horn 7
Installing the aileron linkages 7
Installing the flaps linkages.....8
Installing the horizontal stabilizer 8
Installing the elevator, pushrod and linkages 9
Installing the engine 11
Installing the battery and receiver.....11
Glue the plastic cover 11
Balancing.....11
Lateral balance 12
Control throws 12
Flight preparation pre flight check 12

INTRODUCTION

Thank you for purchasing Phoenix Model products. With over 20 years experience in production and fly testing, Phoenix Model is committed to bring the best quality products and good service to customers. Along with a team of creative engineers and skilled workers, we will always accompany with customers by our great experiences, fully enthusiasm... which will burn our passion!! Joining with us to explore and conquer challenges in the sky ...

Your satisfaction is our success. Please read through this manual before starting construction.

Academy of Model Aeronautics: If you are not already a member of the AMA, please join! The AMA is the governing body of model aviation and membership provides liability insurance coverage, protects modelers' rights and interests and is required to fly at most R/C sites.

Academy of Model Aeronautics
5151 East Memorial Drive Muncie, IN 47302-9252

Tele. (800) 435-9262
Fax (765) 741-0057

Or via the Internet at: http://www.modelaircraft.org

AMA
SINCE 1936

WARRANTY

Phoenix Model guarantees the component parts in this kit to be free from defects in both material and workmanship at the date of purchase by the purchaser.

This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product.
This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than Phoenix Model.

Further, Phoenix Model reserves the right to change or modify this warranty without notice.

DISCLAIMER

Read this disclaimer carefully before using this product. Please strictly follow the instruction manual to assemble and use this.

In that Phoenix Model has no control over the final assembly or material used for final assembly, Phoenix Model is not responsible for loss of use , or other incidental or consequential damages.
Furthermore, Phoenix Model cannot be held liable for personal injury or property damage caused by the use or misuse of Phoenix Model products. By the act of using the user-assembled products, the user accepts all resulting liability.

SAFETY PRECAUTION

- This is not a toy and pilots must be over the age of 14
- Be sure that no other flyers are using your radio frequency.
- Do not smoke near fuel
- Store fuel in a cool, dry place, away from children and pets.
- Wear safety glasses.
- The glow plug clip must be securely attached to the glow plug.
- Do not flip the propeller with your fingers.
- Keep loose clothing and wires away from the propeller.
- Do not start the engine if people are near. Do not stand in line with the side of the propeller.
- Make engine adjustments from behind the propeller only. Do not reach around the spinning propeller.
- Moisture causes damage to electronics. Avoid water exposure to all equipment not specifically designed and protected for this purpose.

IMPORTANT BUILDING NOTES

- Please trial fit all the parts. Make sure you have the correct parts and that they fit and are aligned properly before gluing! This will assure proper assembly. This kit is hand made from natural materials, every plane is unique and minor adjustments may have to be made. However, you should find the fit superior and assembly simple.

- The painted and plastic parts used in this kit are fuel proof. However, they are not tolerant of many harsh chemicals including the following: paint thinner, C/A glue accelerator, C/A glue debonder and acetone. Do not let these chemicals come in contact with the colors on the covering and the plastic parts.

- Some parts included in this kit such as the cowl or wheel pants are made of fiberglass, the fibers of which may cause eye, skin and respiratory tract irritation. Never blow into a part to remove fiberglass dust, as the dust will blow back into your eyes. Always wear safety goggles, a particle mask and rubber gloves when grinding, drilling and sanding fiberglass parts. Vacuum the parts and the work area thoroughly after working with fiberglass parts.

SUGGESTION

To avoid scratching your new airplane, do not unwrap the pieces until they are needed for assembly. Cover your workbench with an old towel or brown paper, both to protect the aircraft and to protect the table. Keep a couple of jars or bowls handy to hold the small parts after you open the bag.

FLIGHT WARNINGS

- Always operate in open areas, away from factories, hospitals, schools, buildings and houses etc.
- NEVER fly your aircraft close to people or built up areas.
- NEVER fly near power lines, aerials or other dangerous areas including airports, motorways etc
- NEVER fly in wet conditions or on windy or stormy days.
- ALWAYS adjust the engine from behind the propeller, and do not allow any part of your body to be in line with the propeller.
- THE PROPELLER IS DANGEROUS Keep fingers, clothing (ties, shirt sleeves, scarves) or any other loose objects that could be caught or drawn in, away from the propeller. Take care at ALL times.
- NEVER use damaged or deformed propellers or spinners.
- Keep all onlookers (especially small children and animals) well back from the area of operation. This is a flying aircraft, which will cause serious injury in case of impact with a person or animal.
- DO NOT dispose of empty fuel containers on a fire this can lead to an explosion.

FLIGHT WARNINGS

- When ready to fly, first extend the transmitter aerial.
- Switch on the transmitter.
- Switch on the receiver.
- Check that the wings are correctly fitted to the fuselage.
- Operate the control sticks on the transmitter and check that the control surfaces move freely and in the CORRECT directions.
- Check that the transmitter batteries have adequate power.
- ALWAYS take off into the wind.
- If the model does not respond correctly to the controls, land it as soon as possible and correct the fault.
- ALWAYS land the model INTO the wind, this ensures that the model lands at the slowest possible speed.
- Switch off the receiver.
- Switch off the transmitter.
- Empty the fuel tank after flying, fuel left in the tank can cause corrosion and lead to engine problems.

COVERING TOOLS

- Top Flite® MonoKote® Sealing Iron
- Top Flite Hot Sock Iron Cover
- Top Flite MonoKote Trim Seal Iron
- Top Flite MonoKote Heat Gun

ADHESIVES AND REQUIRED TOOLS

- Thin CA
- 30-minute epoxy
- 6-minute epoxy
- Threadlocker thread locking cement
- Mixing sticks
- Mixing cups (GPMR8056)
- Epoxy brushes
- Denatured alcohol
- Canopy Glue
- Felt-tipped pen or pencil
- Flat screwdriver
- Adjustable wrench
- Drill
- Hobby knife
- Masking tape
- Phillips screwdriver (large)
- Phillips screwdriver (small)
- Ruler
- Sandpaper
- Soldering iron
- Solder
- Hex wrench
- Drill bit: 1/16-inch (1.5mm), 5/64-inch (2mm), 1/8-inch (3,2mm), 3/16-inch (4,8mm),11/64-inch (4.5mm), 13/64-inch (5,2mm), 1/4-inch (6,4mm)

Academy of Model Aeronautics National Model Aircraft Safety Code

Effective January 1, 2014

A. GENERAL: A model aircraft is a non-human-carrying aircraft capable of sustained flight in the atmosphere. It may not exceed limitations of this code and is intended exclusively for sport, recreation, education and/or competition. All model flights must be conducted in accordance with this safety code and anyadditional rules specific to the flying site.

1. Model aircraft will not be flown:

(a) In a careless or reckless manner.

(b) At a location where model aircraft activities are prohibited.

2. Model aircraft pilots will:

(a) Yield the right of way to all human-carrying aircraft.

(b) See and avoid all aircraft and a spotter must be used when appropriate. (AMA Document #540-D.)

(c) Not fly higher than approximately 400 feet above ground level within three (3) miles of an airport without notifying the airport operator.

(d) Not interfere with operations and traffic patterns at any airport, heliport or seaplane base except where there is a mixed use agreement.

(e) Not exceed a takeoff weight, including fuel, of 55 pounds unless in compliance with the AMA Large Model Airplane program. (AMA Document 520-A.)

(f) Ensure the aircraft is identified with the name and address or AMA number of the owner on the inside or affixed to the outside of the model aircraft. (This does not apply to model aircraft flown indoors.)

(g) Not operate aircraft with metal-blade propellers or with gaseous boosts except for helicopters operated under the provisions of AMA Document #555.

(h) Not operate model aircraft while under the influence of alcohol or while using any drug that could adversely affect the pilot's ability to safely control the model.

(i) Not operate model aircraft carrying pyrotechnic devices that explode or burn, or any device which propels a projectile or drops any object that creates a hazard to persons or property.

Exceptions:

- Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight.
- Rocket motors (using solid propellant) up to a G-series size may be used provided they remain attached to the model during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code but may not be launched from model aircraft.

- Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined withir the Team AMA Program Document. (AMA Document #718.)

(j) Not operate a turbine-powered aircraft, unless in compliance with the AMA turbine regulations. (AMA Documen #510-A.)

3. Model aircraft will not be flown in AMA sanctioned events, air shows or model demonstrations unless:

(a) The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipatec prior to the specific event.

(b) An inexperienced pilot is assisted by an experienced pilot.

4. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT ANSI, SNELL or NOCSAE approved or comply with comparable standards.

B. RADIO CONTROL (RC)

1. All pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoic endangerment of life and property of others.
2. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.
3. At all flying sites a safety line(s) must be established in front of which all flying takes place. (AMA Documen #706.)

(a) Only personnel associated with flying the model aircraft are allowed at or in front of the safety line.

(b) At air shows or demonstrations, a straight safety line must be established.

(c) An area away from the safety line must be maintained for spectators.

(d) Intentional flying behind the safety line is prohibited.

4. RC model aircraft must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment or Amateur Band frequencies.
5. RC model aircraft will not knowingly operate within three (3) miles of any pre-existing flying site without a frequency-management agreement. (AMA Documents #922 and #923.)
6. With the exception of events flown under official AMA Competition Regulations, excluding takeoff and landing, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and the pilot's helper(s) located at the flightline.
7. Under no circumstances may a pilot or other person touch an outdoor model aircraft in flight while it is still unde power, except to divert it from striking an individual.
8. RC night flying requires a lighting system providing the pilot with a clear view of the model's attitude and orientation at all times. Hand-held illumination systems are inadequate for night flying operations.
9. The pilot of an RC model aircraft shall:

(a) Maintain control during the entire flight, maintaining visual contact without enhancement other than by corrective lenses prescribed for the pilot.

(b) Fly using the assistance of a camera or First-Person View (FPV) only in accordance with the procedures outlined in AMA Document #550.

(c) Fly using the assistance of autopilot or stabilization system only in accordance with the procedures outlined in AMA Document #560.

C. FREE FLIGHT

1. Must be at least 100 feet downwind of spectators and automobile parking when the model aircraft is launched.
2. Launch area must be clear of all individuals except mechanics, officials, and other fliers.
3. An effective device will be used to extinguish any fuse on the model aircraft after the fuse has completed it function.

D. CONTROL LINE

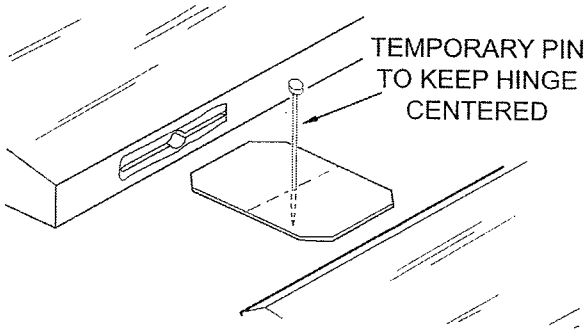
1. The complete control system (including the safety thong where applicable) must have an inspection and pull tes prior to flying.
2. The pull test will be in accordance with the current Competition Regulations for the applicable model aircra category.
3. Model aircraft not fitting a specific category shall use those pull-test requirements as indicated for Control Lin Precision Aerobatics.
4. The flying area must be clear of all utility wires or poles and a model aircraft will not be flown closer than 50 fee to any above-ground electric utility lines.
5. The flying area must be clear of all nonessential participants and spectators before the engine is started.

PREPARATIONS

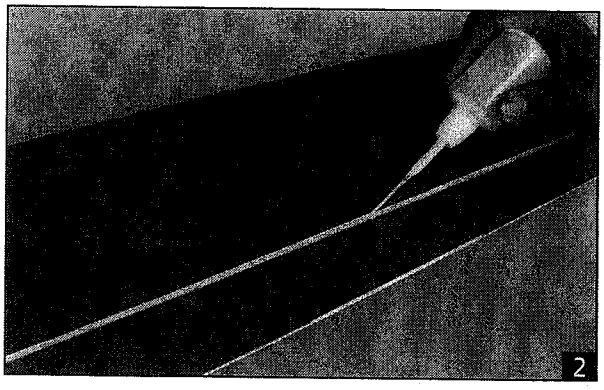
Use a covering iron with a covering sock on high heat to tighten the covering if necessary. Apply pressure over sheeted areas to thoroughly bond the covering to the wood.

INSTALLING THE AILERONS

1. Test fit the ailerons to the wing with the hinges. If the hinges don't remain centered, stick a pin through the middle of the hinge to hold it in position.

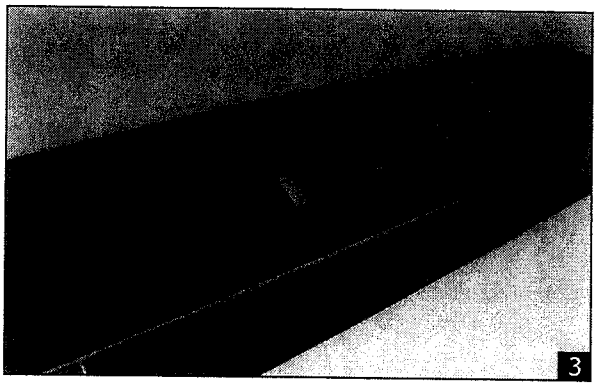


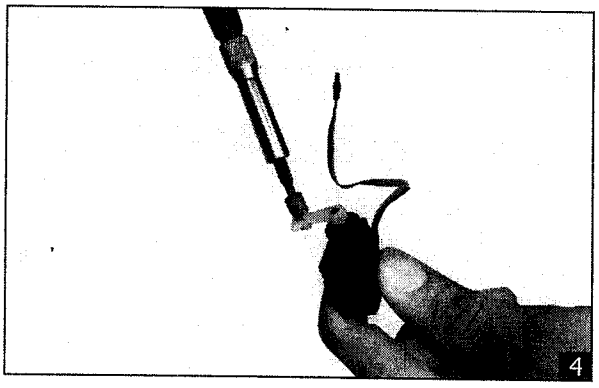
5. Apply six drops of thin CA to the top and bottom of each hinge. Do not use CA accelerator. After the CA has fully hardened, test the hinges by pulling on the aileron.



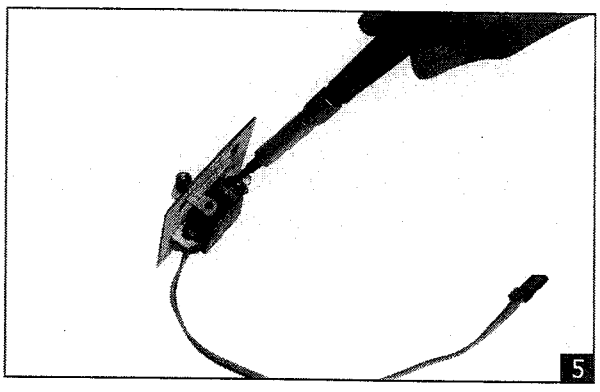
INSTALLING THE AILERON SERVOS

1. Install the rubber grommets and brass eyelets onto the aileron servo.
2. Install the metal connector to the servo arm.
3. Using a modeling knife, remove the covering from over the pre-cut servo arm exit hole on the aileron servo tray / hatch. This hole will allow the servo arm to pass through when installing the aileron pushrods.

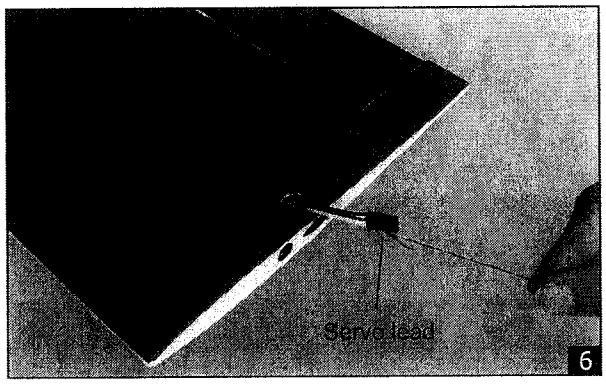




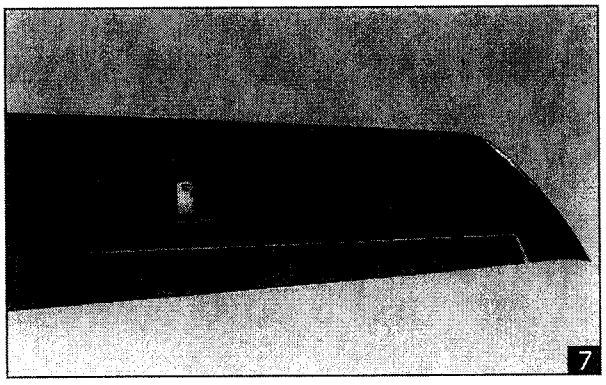
4. Install the servo to the servo box.



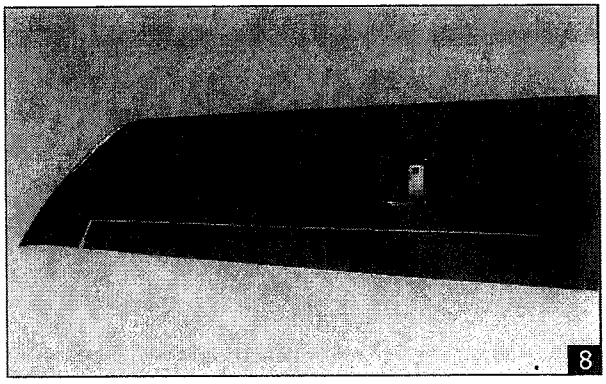
5. Using the thread as a guide and using masking tape, tape the servo lead to the end of the thread: carefully pull the thread out. When you have pulled the servo lead out, remove the masking tape and the servo lead from the thread.



6. Secure the servo box into the wing.



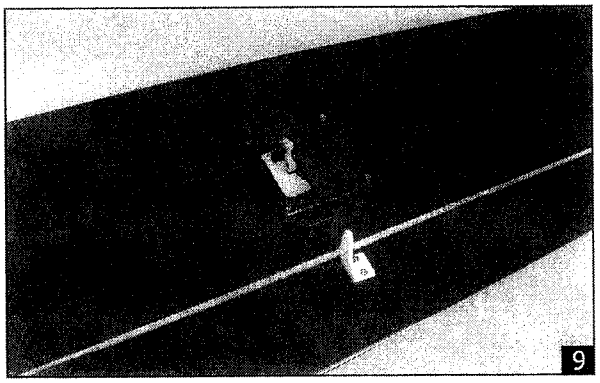
7. Make the same way to install the second aileron servo.

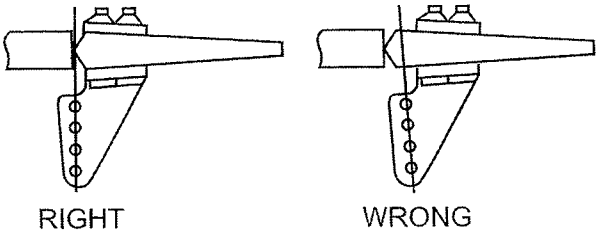


INSTALLING THE CONTROL HORNS

1. One aileron control horn in positioned on each aileron. Using a ruler and a pen, locate and mark the location of the control horn. It should be mounted on the bottom side of the aileron at the leading edge, in line with the aileron pushrod.

2. Drill two holes through the aileron using the control horn as a guide and screw the control horn in place.





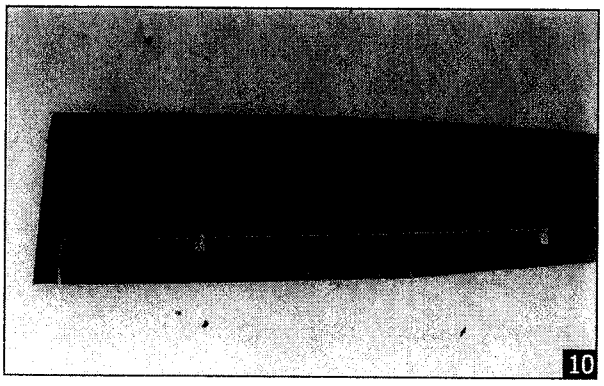
3. Repeat step # 1 - # 2 to install the control horn on the opposite aileron.

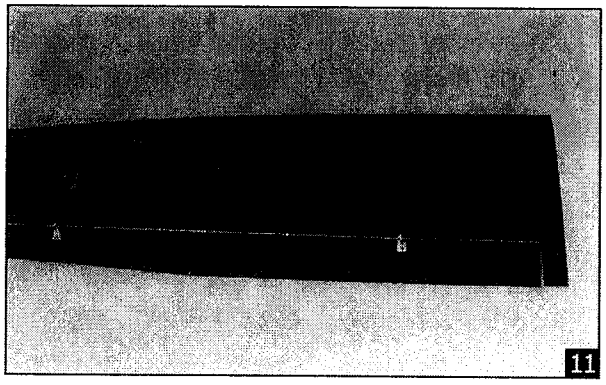
INSTALLING THE FLAP SERVO

- Repeat step #1 - #7 from installing the aileron servo to install the flap servo.

INSTALLING THE FLAP CONTROL HORN

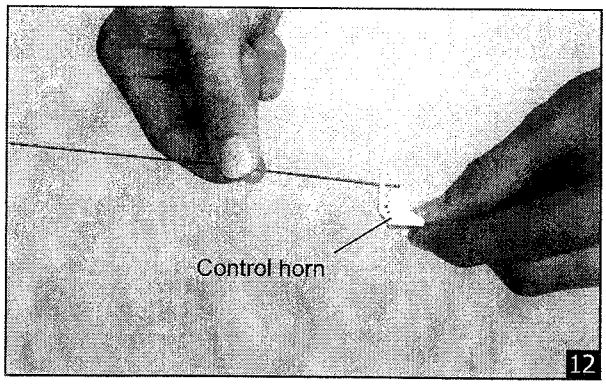
- Repeat step #1 - #3 from installing the control horn aileron to install the control horn flap.


10


11

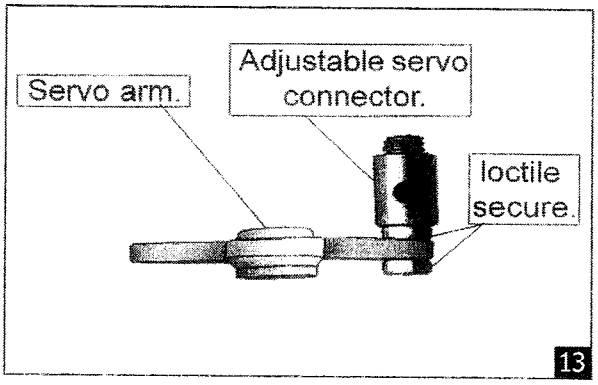
INSTALLING THE AILERON LINKAGES

1. Locate the long piece of wire used for the aileron pushrod. One end of the wire has been pre-bend into a "Z " bend at factory. This "Z" bend should be inserted into the control horn for aileron.



12

2. Install the metal connector to the servo arm of the aileron servo.



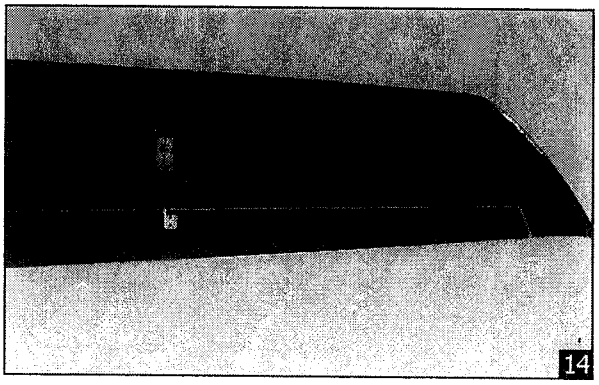
13

3. Plug the aileron servo into the receiver and center the servo. Install the servo arm onto the servo.

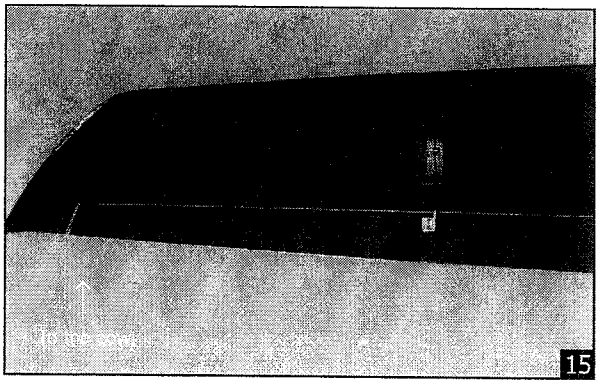
4. Slide the aileron pushrod through the metal connector.

5. Center the aileron and hold it in place using a piece of masking tape.

6. With the aileron and the aileron servo center. Secure the screw on the metal connector.

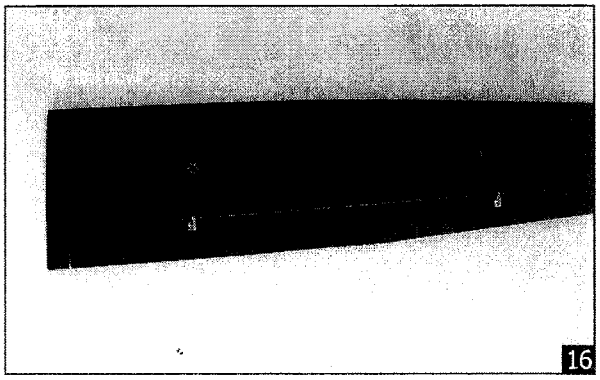

14

7. Repeat step # 1 - # 6 to install the second aileron linkage. After both linkages are completed, connect both of the aileron servo leads using a Y-harness you have purchased separately.

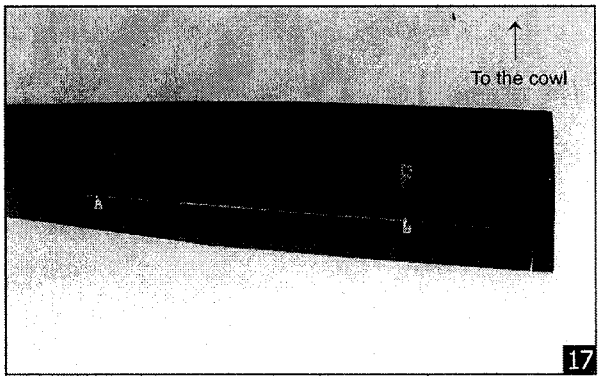

15

INSTALLING THE FLAP LINKAGES

1. Repeat #1 - #6 from installing the aileron linkage to install the flap linkage.

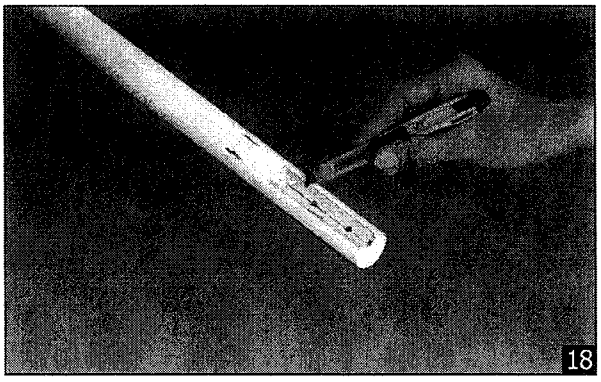


2. Repeat #1 - #6 from installing the aileron linkage to install the second flap linkage. After both linkages are completed, connect both of the aileron servo leads using a Y-harness you have purchased separately.



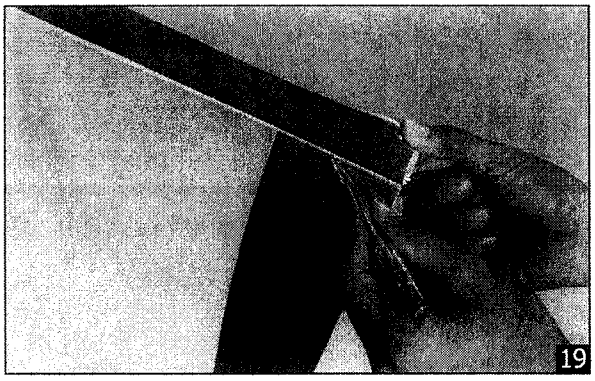
INSTALLING THE HORIZONTAL STABILIZER

1. Using a modeling knife, cut away the covering from the fuselage for the stabilizer and remove it.



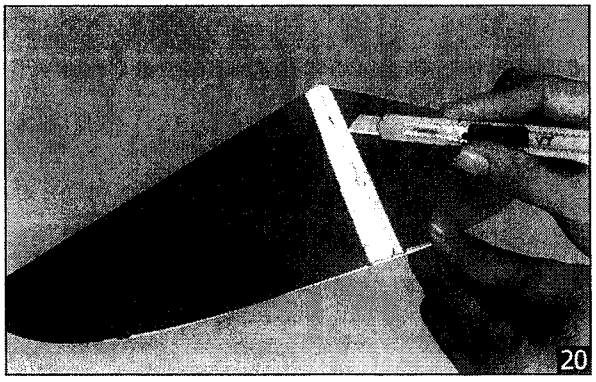
2. Check the fit of the horizontal stabilizer in its slot. Make sure the horizontal stabilizer is square and centered to the fuselage by taking measurements, but don't glue anything yet.

3. With the horizontal stabilizer correctly aligned, mark the shape of the fuselage onto the bottom of the horizontal stabilizer using a water soluble/ non-permanent felt-tip pen.

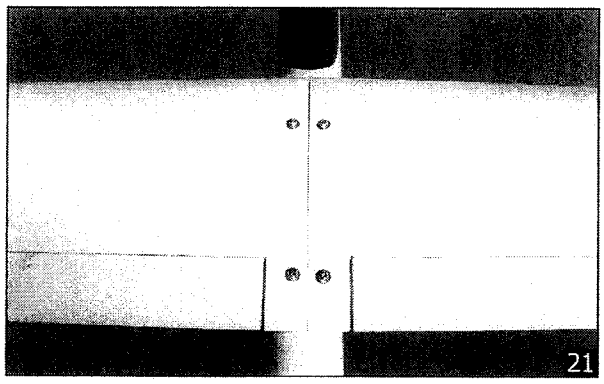


4. Remove the stabilizer. Using the lines you just drew as a guide, carefully remove the covering from between them using a modeling knife.

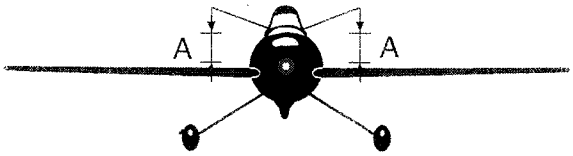
⚠ *When cutting through the covering to remove it, cut with only enough pressure to only cut through the covering it's self. Cutting into the balsa structure may weaken it. This could lead to possible failure during flight.*

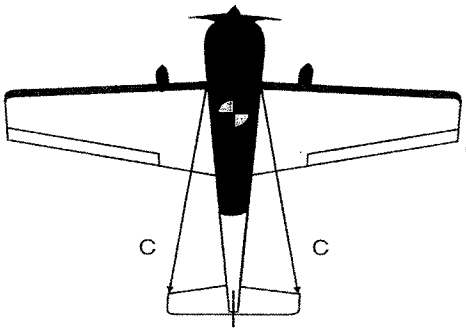


5. Attach the wing to the fuselage as picture.

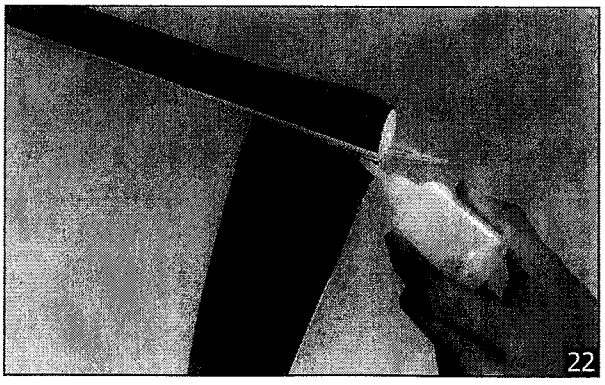


6. Test the position of the elevator and adjust it as shown.



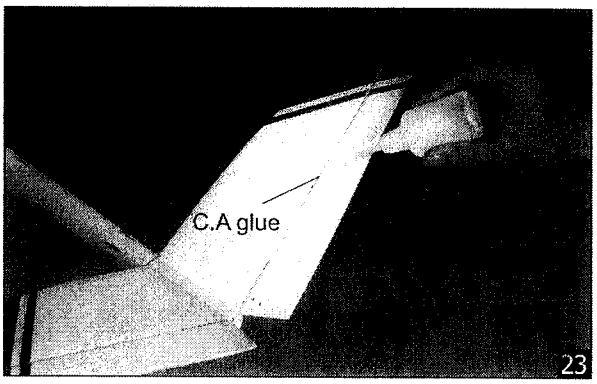


7. When you are sure that everything is aligned correctly, mix up a generous amount of 30 minute epoxy. Apply a thin layer to the bottom of the stabilizer mounting area and to the stabilizer mounting platform sides in the fuselage. Insert the stabilizer in place and re-align. Double check all of your measurements one more time before the epoxy cures. Remove any excess epoxy using a paper towel and rubbing alcohol and hold the stabilizer in place with T-pins or masking tape.



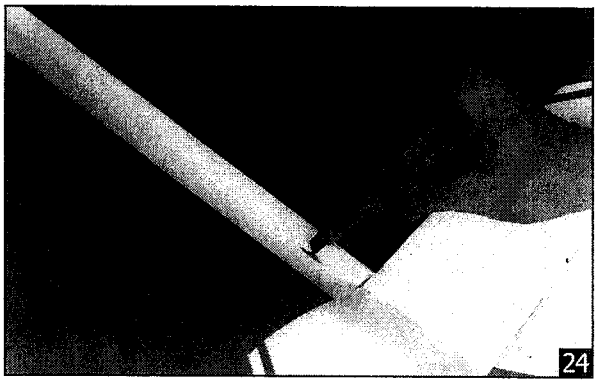
8. After the epoxy has fully cured, remove the masking tape or T-pins used to hold the stabilizer in place and carefully inspect the glue joints. Use more epoxy to fill in any gaps that were not filled previously and clean up the excess using a paper towel and rubbing alcohol.

9. Repeat step #1 - #5 from install the aileron to install the elevator.

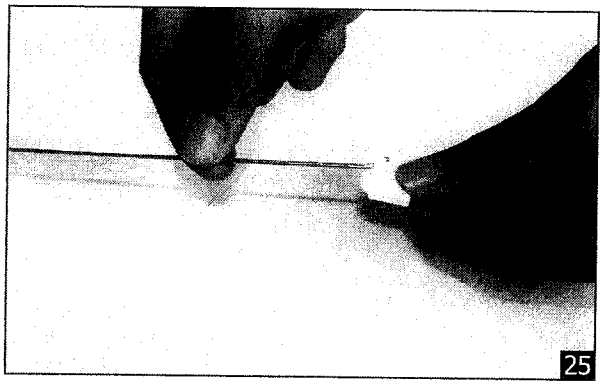


INSTALLING THE ELEVATOR, PUSHROD AND LINKAGES

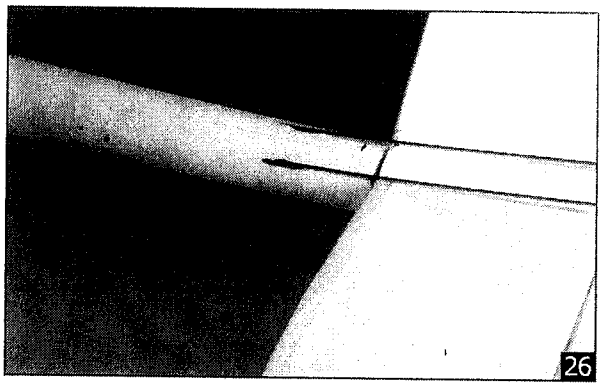
1. Carefully cut away the covering material from the slot.



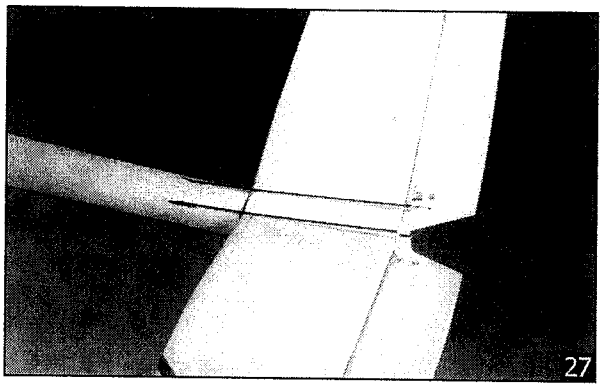
2. Locate the long piece of wire used for the elevator pushrod. One end of the wire has been pre-bend into a "Z " bend at factory. This "Z" bend should be inserted into the control horn for elevator.



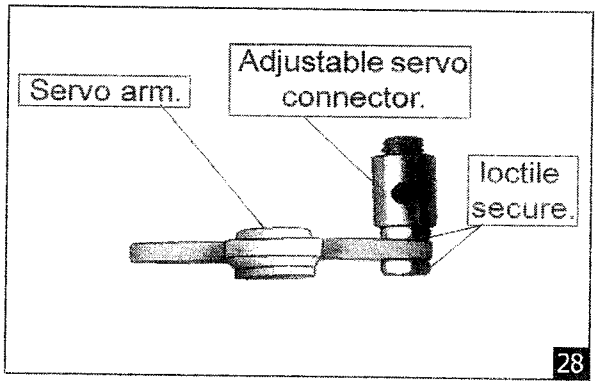
3. Slide the wire pushrod into the fuselage.



4. Place the control horn onto the elevator, and drill two 1.6mm holes through the elevator using the control horn as a guide and screw the control horn in place.



5. Install the metal connector to the servo arm of the elevator servo.

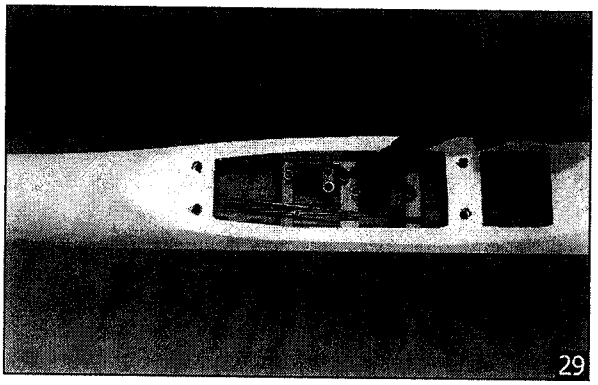


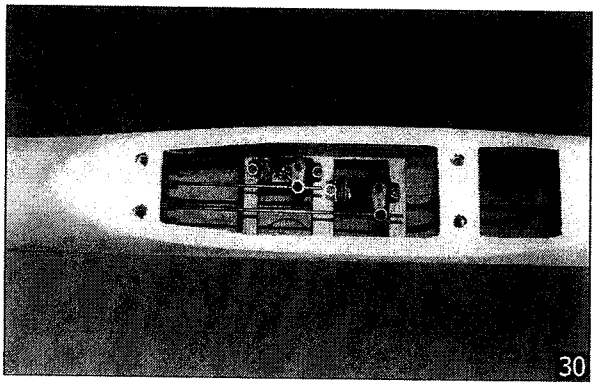
6. Plug the elevator servo into the receiver and center the servo. Install the servo arm onto the servo.

7. Slide the elevator pushrod through the metal connector.

8. Center the elevator and hold it in place using a piece of masking tape.

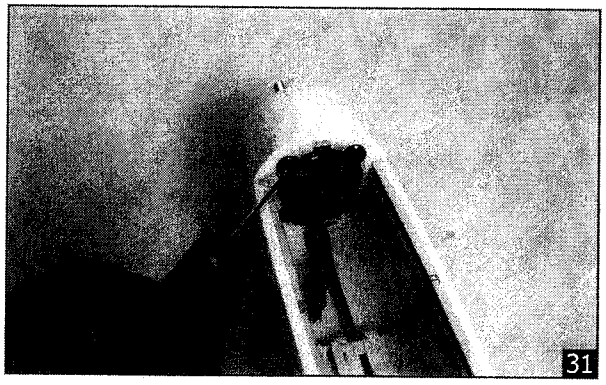
9. With the elevator and the elevator servo center. Secure the screw on the metal connector.



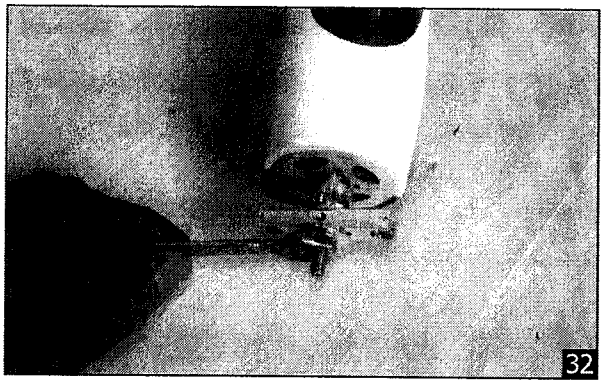


INSTALLING THE ENGINE

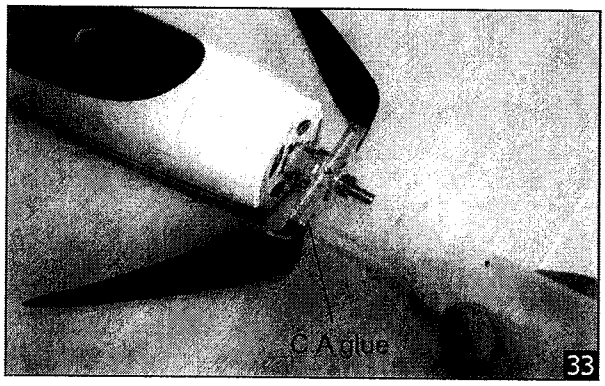
1. Secure the motor.



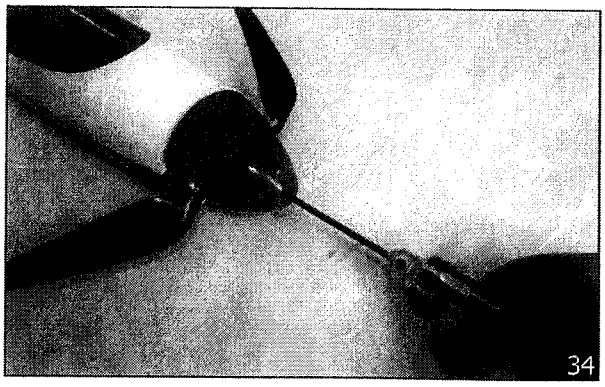
2. Secure the aluminum hub to the adafter.



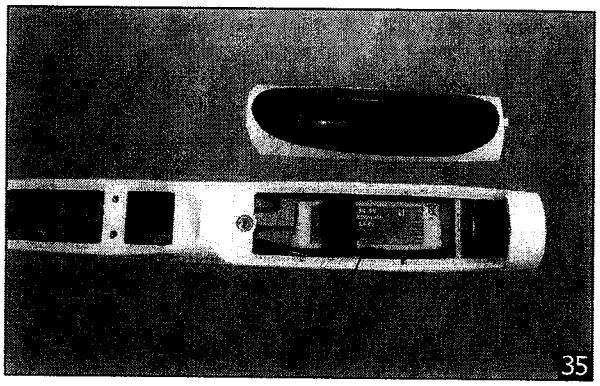
3. Screw the nut and secure it by C.A glue.



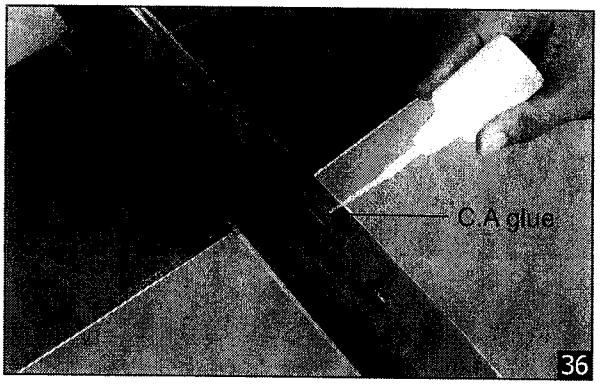
4. Secure the spinner.

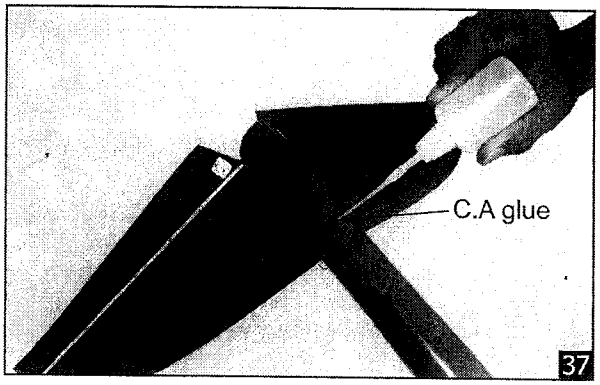


INSTALLING THE BATTERY AND RECEIVER



GLUE THE PLASTIC COVER





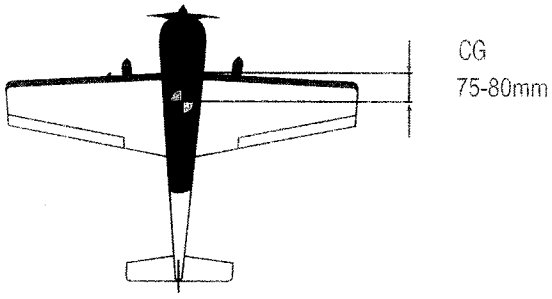
BALANCING

1. It is critical that your airplane be balanced correctly. Improper balance will cause your plane to lose control and crash.

   THE CENTER OF GRAVITY IS LOCATED 75-80mm BACK FROM THE LEADING EDGE OF THE WING, AT THE FUSELAGE. BALANCE A PLANE UPSIDE DOWN WITH THE FUEL TANK EMPTY.

2. Mount the wing to the fuselage. Using a couple of pieces of masking tape, place them on the top side of the wing 75-80mm back from the leading edge, at the fuselage sides.

3. If the nose of the plane falls, the plane is nose heavy. To correct this first move the battery pack further back in the fuselage. If this is not possible or does not correct it, stick small amounts of lead weight on the fuselage under the horizontal stabilizer. If the tail of the plane falls, the plane is tail heavy. To correct this, move the battery and receiver forward or if this is not possible, stick weight into the firewall. When balanced correctly, the airplane should sit level or slightly nose down when you lift it up with your fingers.



LATERAL BALANCE

⚠ *After you have balanced a plane on the C.G. You should laterally balance it. Doing this will help the airplane track straighter.*

5. Turn the airplane upside down. Attach one loop of heavy string to the engine crankshaft and one to the tail wheel wire. With the wings level, carefully lift the airplane by the string. This may require two people to make it easier.

6. If one side of the wing fall, that side is heavier than the opposite. Add small amounts of lead weight to the bottom side of the lighter wing half's wing tip. Follow this procedure until the wing stays level when you lift the airplane.

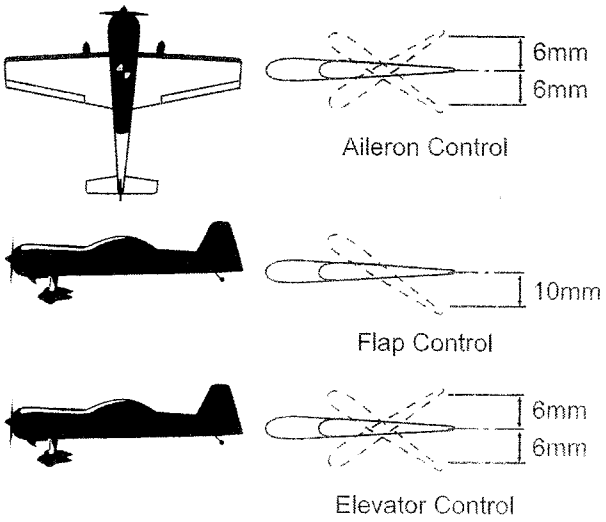
CONTROL THROWS

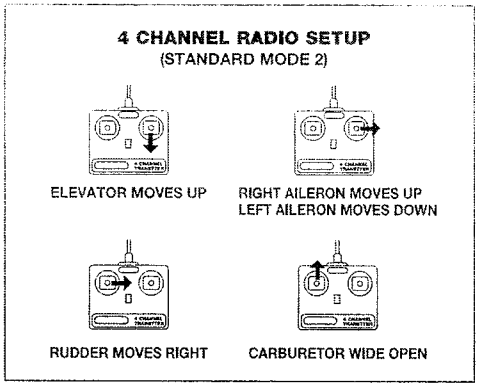
1. We highly recommend setting up a plane using the control throws listed.

2. The control throws should be measured at the widest point of each control surface.

3. Check to be sure the control surfaces move in the correct directions.

Aileron	: 6 mm right	6 mm left
Flap	: 10 mm down	
Elevator	: 6mm up	6mm down





FLIGHT PREPARATION

PRE FLIGHT CHECK

1. Completely charge your transmitter and receiver batteries before your first day of flying.

2. Check every bolt and every glue joint in your plane to ensure that everything is tight and well bonded.

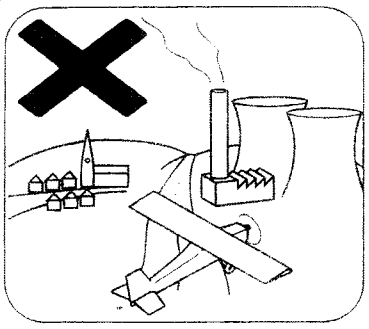
3. Double check the balance of the airplane.

4. Check the control surface.

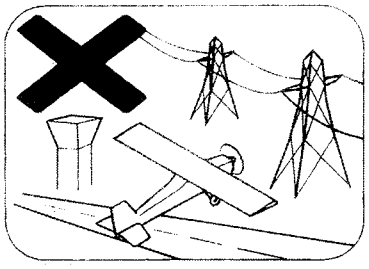
5. Check the receiver antenna. It should be fully extended and not coiled up inside the fuselage.

6. Properly balance the propeller.

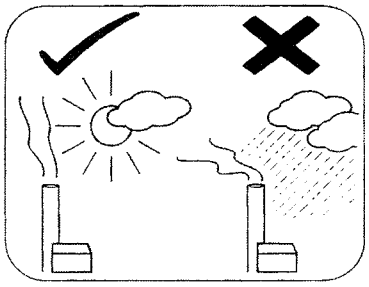
I/C FLIGHT WARNINGS



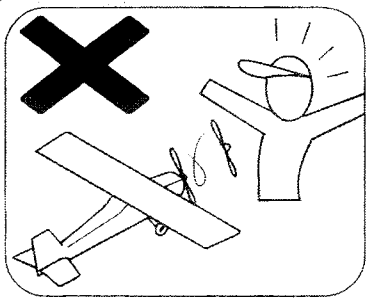
Always operate in open areas, away from factories, hospitals, schools, buildings and houses etc. **NEVER** fly your aircraft close to people or built up areas.



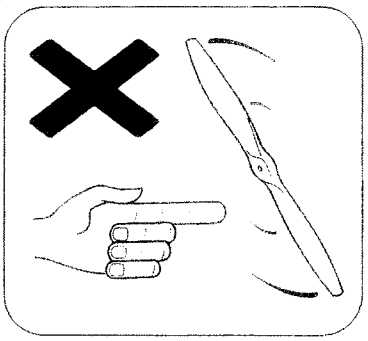
NEVER fly near power lines, aerials or other dangerous areas including airports, motorways etc.



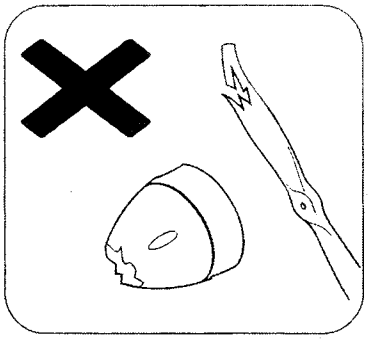
NEVER fly in wet conditions or on windy or stormy days.



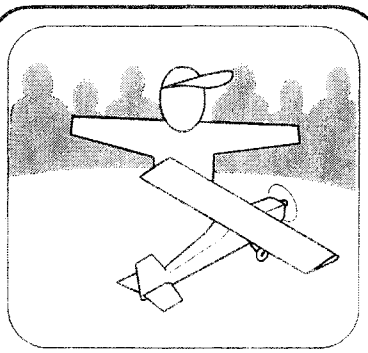
ALWAYS adjust the engine from behind the propeller, and do not allow any part of your body to be in line with the propeller.



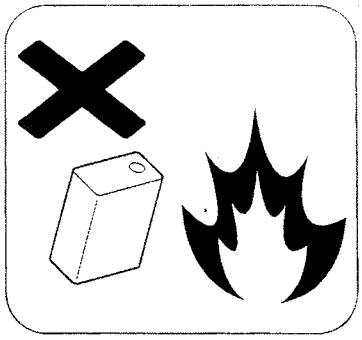
THE PROPELLER IS DANGEROUS
Keep fingers, clothing (ties, shirt sleeves, scarves) or any other loose objects that could be caught or drawn in, away from the propeller. Take care at **ALL** times.



NEVER use damaged or deformed propellers or spinners.

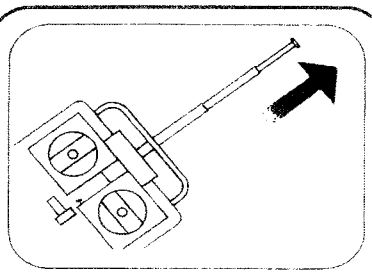


Keep all onlookers (especially small children and animals) well back from the area of operation. This is a flying aircraft, which will cause serious injury in case of impact with a person or animal.

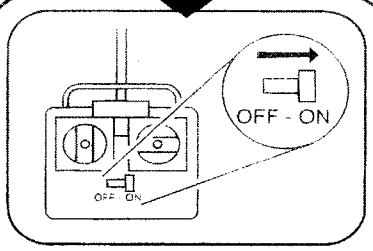


DO NOT dispose of empty fuel containers on a fire, this can lead to an explosion.

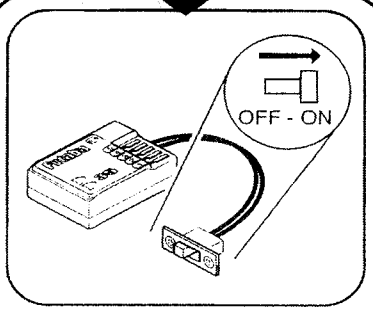
I/C FLIGHT GUIDELINES



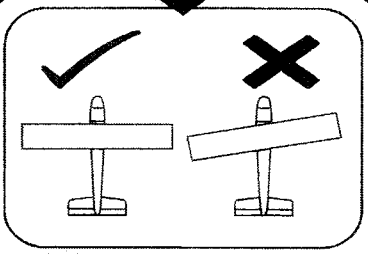
When ready to fly, first extend the transmitter aerial.



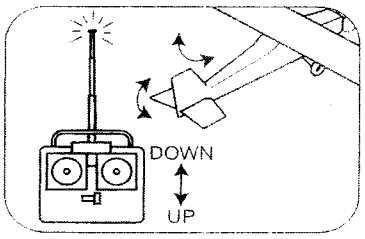
Switch on the transmitter.



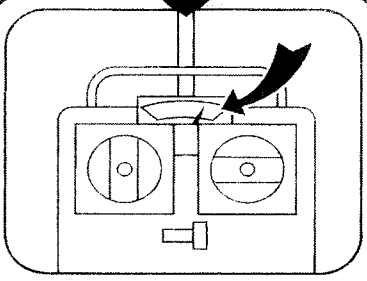
Switch on the receiver.



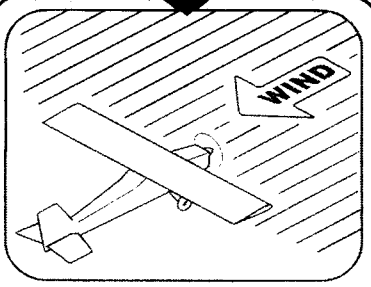
Check that the wings are correctly fitted to the fuselage.



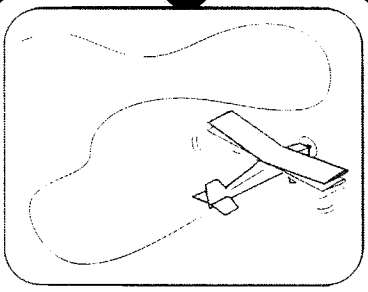
Operate the control sticks on the transmitter and check that the control surfaces move freely and in the CORRECT directions.



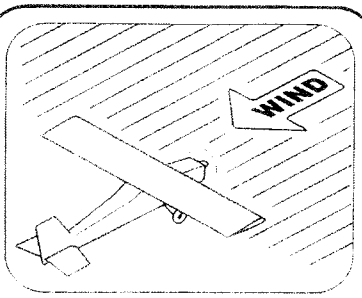
Check that the transmitter batteries have adequate power.



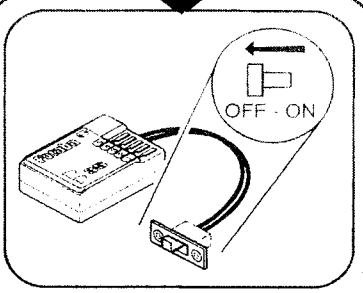
ALWAYS take off into the wind.



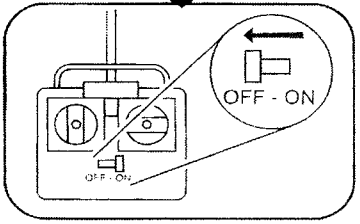
If the model does not respond correctly to the controls, land it as soon as possible and correct the fault.



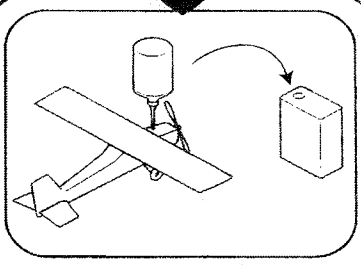
ALWAYS land the model INTO the wind, this ensures that the model lands at the slowest possible speed.



Switch off the receiver.



Switch off the transmitter.



Empty the fuel tank after flying, fuel left in the tank can cause corrosion and lead to engine problems.

Made in Vietnam