



**READ THROUGH THIS MANUAL BEFORE STARTING CONSTRUCTION. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.**



## SPECIFICATION

- Wingspan: 1444mm (56.8in)
- Length: 1168mm (45.9 in)
- Flying weight: 2400-2600 gr
- Wing area: 35.2 dm<sup>2</sup>
- Wing loading: 70g/dm<sup>2</sup>
- Wing type: Naca airfoils
- Covering type: V-kote film
- Spinner size: Plastic 58mm (included)
- Radio: 4 channel minimum (not included)
- Servo: 5 standard servo: 2 aileron; 1 elevator; 1 rudder; 1 throttle (not included)
- Recommended receiver battery: 4.8-6V / 800-1200mAh NiMH (not included)
- Servo mount: 21mm x 42 mm
- Propeller: suit with your engine
- Engine: .46-.55 / 2-stroke (not included)
- Motor: brushless outrunner 1000-1400 W, 480 KV (not included)
- Gravity CG: 70mm (2.7in) Back from the leading edge of the wing, at the fuselage

- Control throw Ailerons: Low: 11mm up/down, 10% expo; High: 14mm up/down, 10% expo
  - Control throw Elevators: Low: 11mm up/down, 12% expo; High: 14mm up/down, 12% expo
  - Control throw Rudder: Low: 25mm right/left, 15% expo; High: 40mm right/left, 15% expo
  - Experience level: Intermediate
  - Plane type: Low wing sport
- RECOMMENDED MOTOR AND BATTERY SET UP**
- Motor: RIMFIRE .46 (not included)
  - Lipo cell: 4-6cells / 4000-5000mAh (not included)
  - Esc: 50-70A (not included)



## **UNDER SAFETY PRECAUTIONS**

**This radio control model is not a toy!**

- It is highly recommended that first-time builders seek advice of experienced modelers before beginning assembly.
- Assemble this kit only in places out of children's reach!
- Take enough safety precautions prior to operating this model.  
You are responsible for this model's assembly and safe operation!
- Always keep this instruction manual ready at hand for quick reference, even after completing the assembly.

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## 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>



**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)

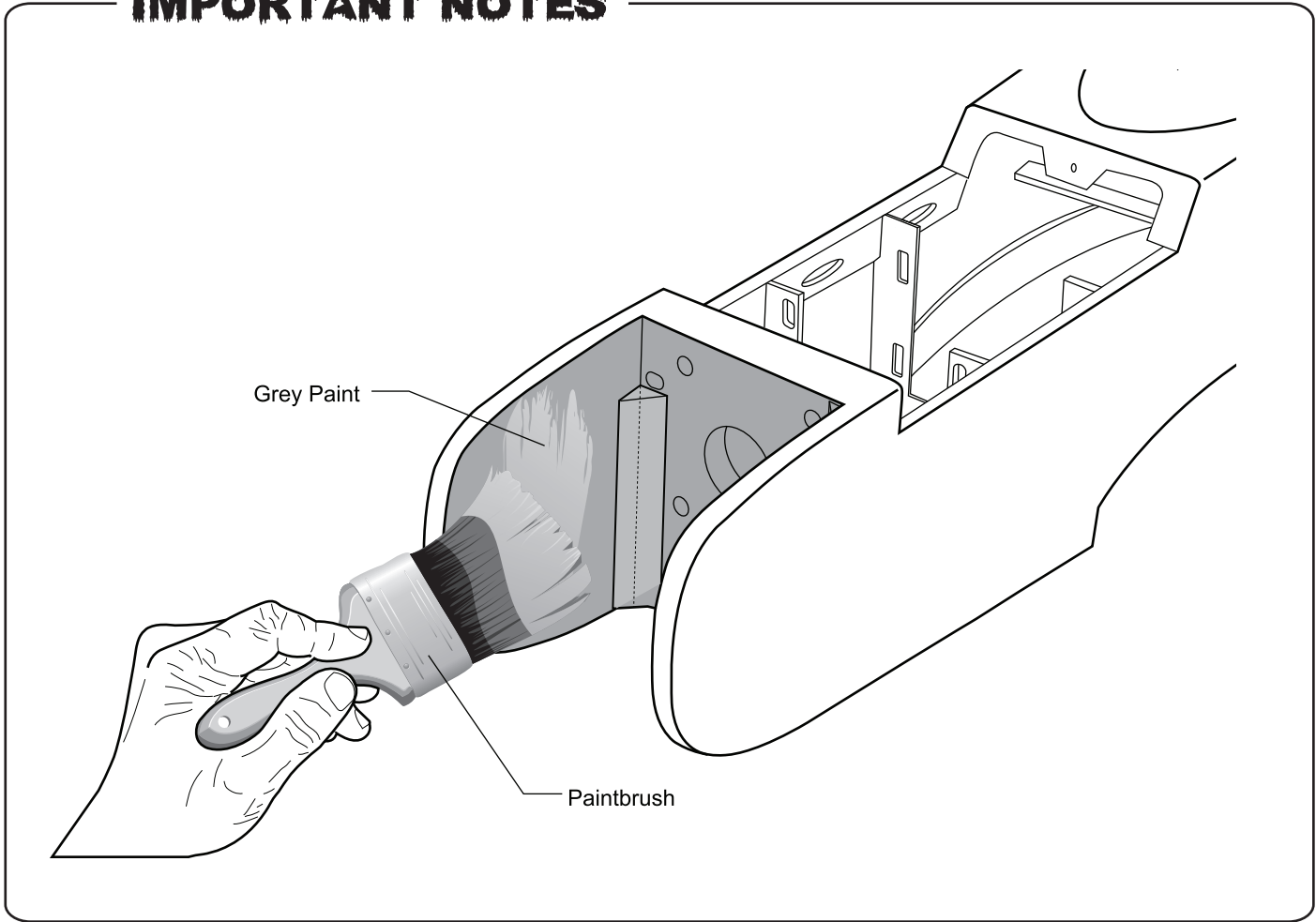
**Academy of Model Aeronautics National Model Aircraft Safety Code**

**Effective January 1, 2014**

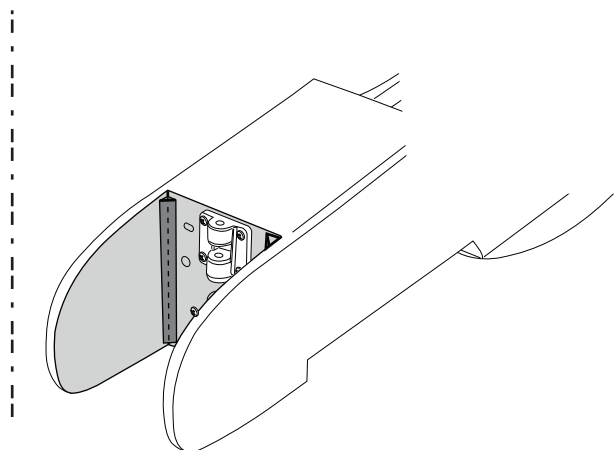
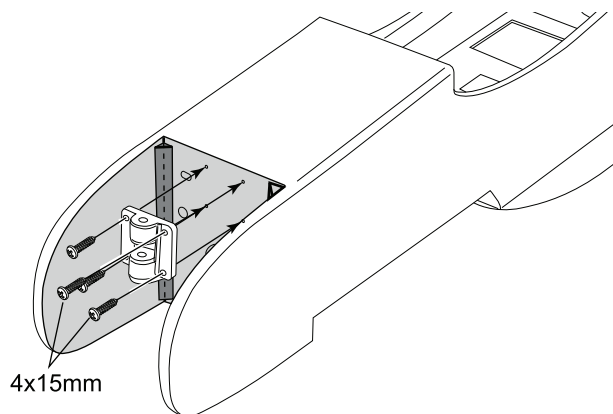
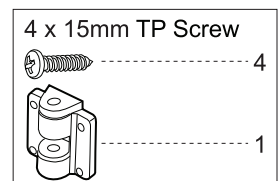
- A. GENERAL: A model aircraft is a non-human-carrying aircraft capable of sustained flight in the atmosphere. It may not exceed limitations of this code and is intended exclusively for sport, recreation, education and/or competition. All model flights must be conducted in accordance with this safety code and any additional rules specific to the flying site.
1. Model aircraft will not be flown:
    - (a) In a careless or reckless manner.
    - (b) At a location where model aircraft activities are prohibited.
  2. Model aircraft pilots will:
    - (a) Yield the right of way to all 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 within the Team AMA Program Document. (AMA Document #718.)
- (j) Not operate a turbine-powered aircraft, unless in compliance with the AMA turbine regulations. (AMA Document #510-A.)
- 3. Model aircraft will not be flown in AMA sanctioned events, air shows or model demonstrations unless:
  - (a) The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipated prior to the specific event.
  - (b) An inexperienced pilot is assisted by an experienced pilot.
- 4. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.
- B. RADIO CONTROL (RC)
  - 1. All pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others.
  - 2. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.
  - 3. At all flying sites a safety line(s) must be established in front of which all flying takes place. (AMA Document #706.)
    - (a) Only personnel associated with flying the model aircraft are allowed at or in front of the safety line.
    - (b) At air shows or demonstrations, a straight safety line must be established.
    - (c) An area away from the safety line must be maintained for spectators.
    - (d) Intentional flying behind the safety line is prohibited.
  - 4. RC model aircraft must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
  - 5. RC model aircraft will not 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 under power, except to divert it from striking an individual.
  - 8. RC night flying requires a lighting system providing the pilot with a clear view of the model's attitude and orientation at all times. Hand-held illumination systems are inadequate for night flying operations.
  - 9. The pilot of 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 its function.
- D. CONTROL LINE
  - 1. The complete control system (including the safety thong where applicable) must have an inspection and pull test prior to flying.
  - 2. The pull test will be in accordance with the current Competition Regulations for the applicable model aircraft category.
  - 3. Model aircraft not fitting a specific category shall use those pull-test requirements as indicated for Control Line 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 feet 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.

### IMPORTANT NOTES



### STEERABLE NOSE WHEEL MOUNT



**\*\*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 bags.

**\*\*NOTE\*\*** 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. Since the Scanner ARF 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.

**\*\*WARNING\*\*** The paint 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.

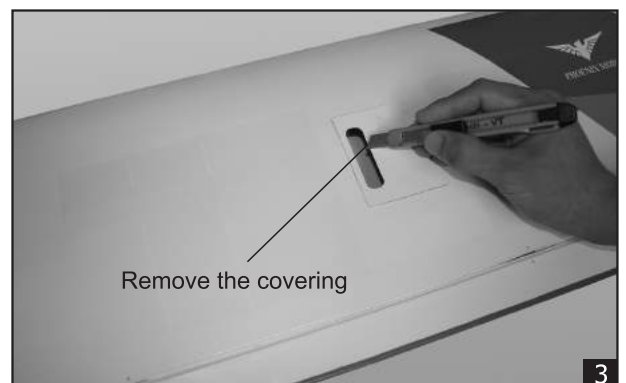
## **PREPARATIONS**

Remove the tape and separate the ailerons from the wing and the elevators from the stab. 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 AILERON SERVOS**

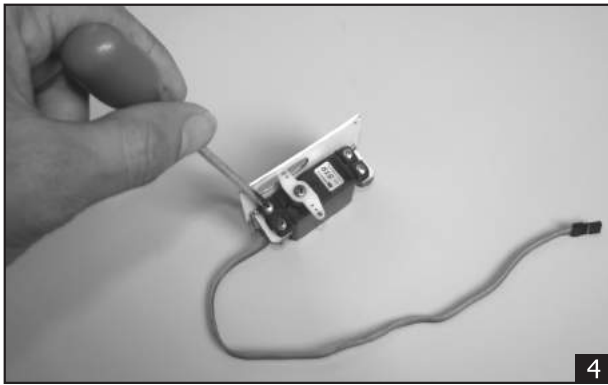
1. Install the rubber grommets and brass eyelets onto the aileron servo.
2. Using a modeling knife, remove the covering from over the pre-cut servo arm exit hole on the aileron servo tray / hatch. This hole will allow the servo arm to pass through when installing the aileron pushrods.



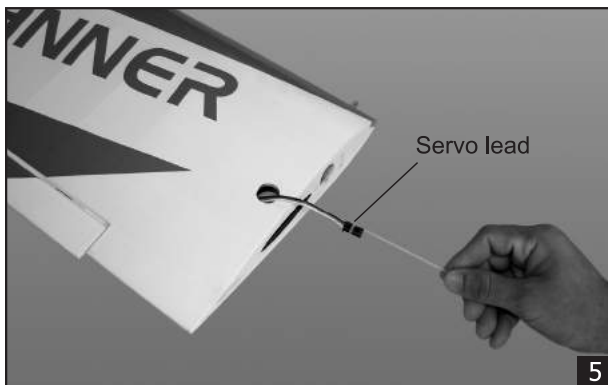
## **INSTALLING THE AILERONS**

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.
2. 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.

3. Place the servo into the servo tray. Center the servo within the tray and drill 1,6mm pilot holes through the block of wood for each of the four mounting screws provided with the servo.



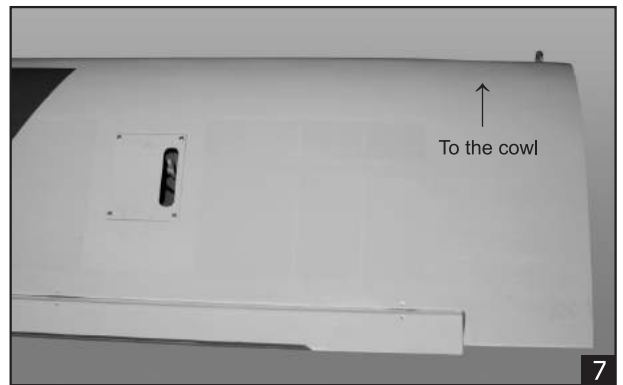
- Using the thread as a guide and using masking tape, tape the servo lead to the end of the thread: carefully pull the thread out. When you have pulled the servo lead out, remove the masking tape and the servo lead from the thread.



- Place the aileron servo tray / hatch into the servo box on the bottom of the wing and drill 1,6mm pilot holes through the tray and the servo box for each of the four mounting screws. Secure the servo tray in place using the mounting screws provided ( 2mm x 12mm ).



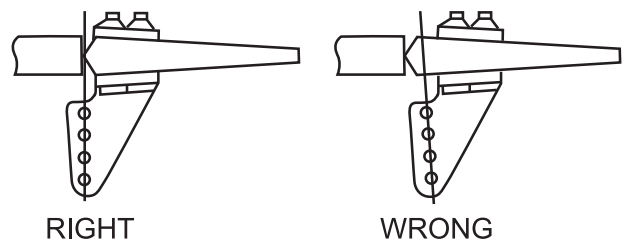
- Repeat step # 2 - # 5 to install the second aileron servo in the opposite wing half.



- Using masking tape, tape the servo leads on to the top of the wing.

### **INSTALLING THE CONTROL HORNS**

- 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.
- Drill two 1.6mm holes through the aileron using the control horn as a guide and screw the control horn in place.

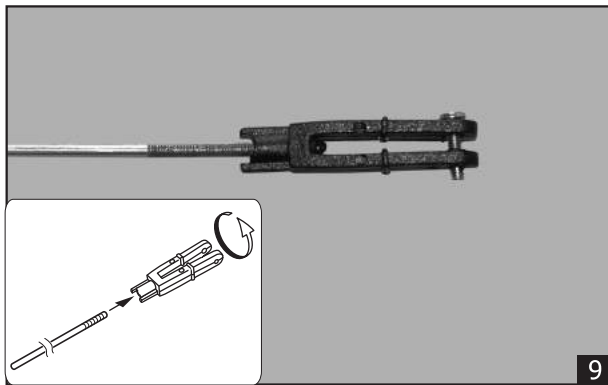


- Repeat step # 1 - # 2 to install the control horn on the opposite aileron.

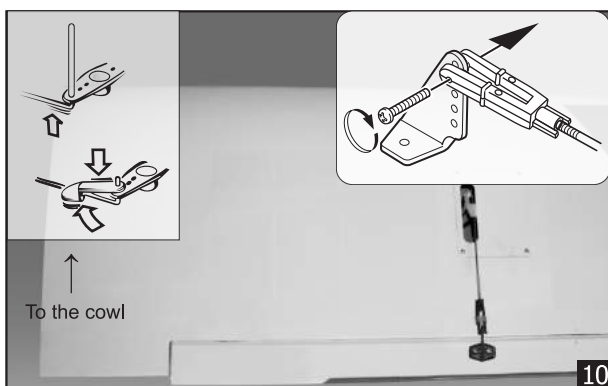
### **INSTALLING THE AILERON LINKAGES**

- Working with the aileron linkage for now, thread one nylon clevis onto one of the 2mm x 180mm threaded wires.

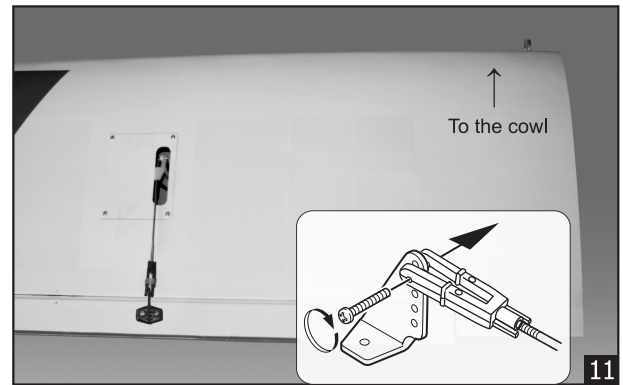




2. Attach the clevis to the outer hole in the control horn.
3. Locate one nylon servo arm, and using wire cutters, remove all but one of the arms. Using a 2mm drill bit, enlarge the third hole out from the center of the arm to accommodate the aileron pushrod wire.
4. Plug the aileron servo into the receiver and center the servo. Install the servo arm onto the servo. The servo arm should be perpendicular to the servo and point toward the middle of the wing.
5. Center the aileron and hold it in place using a couple of pieces of masking tape.
6. With the aileron and aileron servo centered, carefully place a mark on the aileron pushrod wire where it crosses the hole in the servo arm.
7. Using pliers, carefully make a 90 degree bend down at the mark made. Cut off the excess wire, leaving about 4mm beyond the bend.
8. Insert the 90 degree bend down through the hole in the servo arm. Install one nylon snap keeper over the wire to secure it to the arm. Install the servo arm retaining screw and remove the masking tape from the aileron.

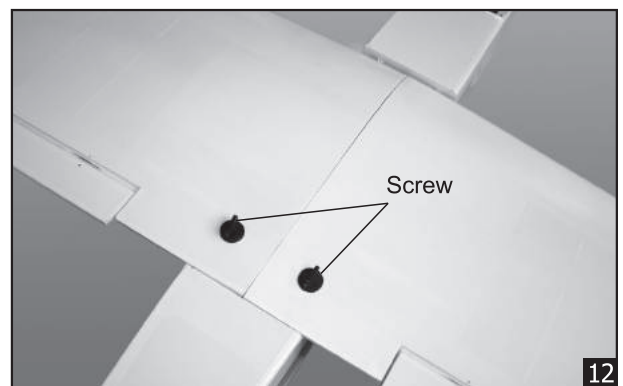


9. Repeat step # 4 - # 8 to install the second aileron linkage. After both linkages are completed, connect both of the aileron servo leads using a Y-harness you have purchased separately.



## INSTALLING THE WING TO THE FUSELAGE

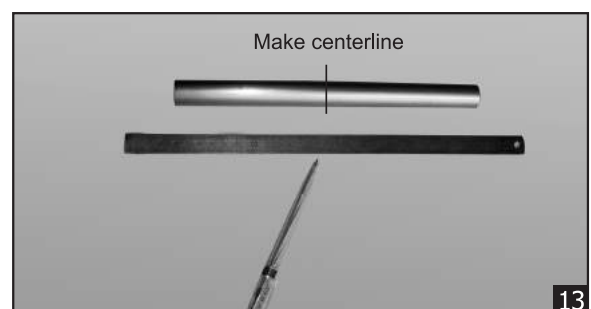
Attach the wings to the joiner tube and using the nylon thumbscrews to secure the wing panels to the fuselage.



## WING ASSEMBLY

**\*Note\*** We highly recommend using 30 Minute Epoxy over faster curing epoxies for several reasons. First, slower curing epoxy is stronger. It also provides more working time, allowing the builder to properly align the parts. Using fast cure epoxy when joining the wing halves could result in the glue drying before the wing halves are aligned properly, causing damage to the wing assembly. Also, when joining the wing halves, the entire area of both center ribs need to be joined completely with no gaps existing. Not following these steps carefully, may result in failure of the wing center section during flight.

- 1) Locate the plywood wing dihedral brace. Using a ruler, locate it's center and place a mark. Draw a vertical line at the mark just made . See **photo #1 below**.

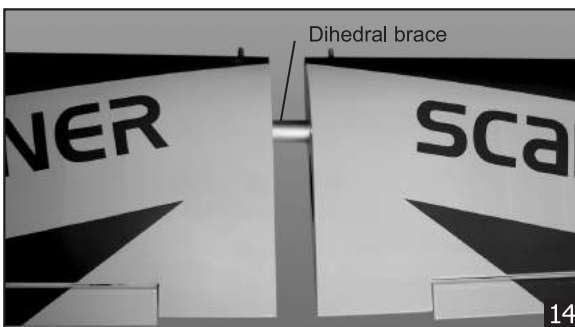


2) Test fit the dihedral brace into each wing half. The brace should slide in easily up to the centerline you drew. If it does not, use 220 grit sandpaper with a sanding block and sand down the edges and ends of the brace until the proper fit is obtained.

**\*Note\*** the dihedral brace is cut in the shape of a "V". This shape gives the wing the correct dihedral angle. Make sure you don't test fit the brace upside down.

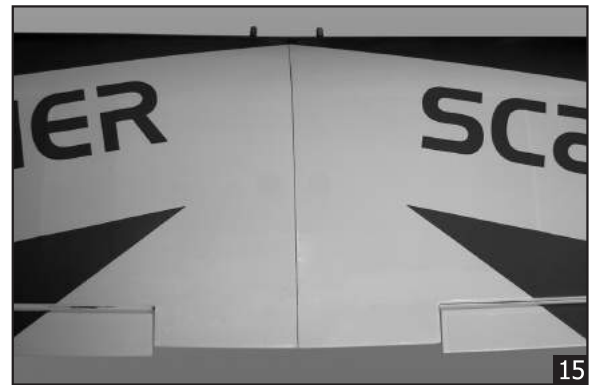
3) When satisfied with the fit of the dihedral brace in each wing half, remove the brace. Mix equal amounts of part A and part B 30 minute epoxy. Coat all sides of the dihedral brace box and half of the wing brace with the epoxy. Make sure to cover the top and bottom as well as the sides. Use enough epoxy to fill any gaps.

4) Insert the dihedral brace into one wing half up to the centerline. Wipe off any excess epoxy that may have squeezed out of the joint using paper towels. **See photo #2 below**



5) Once the epoxy has cured, trial fit both wing halves together. The center ribs should fit flush together with little or no gaps existing. If gaps do exist, use 220 Grit sandpaper and sand down the high spots on the root ribs and the wing joiner until the proper fit is obtained. The amount of dihedral is built into the wings by angling the root ribs the correct amount. With one wing half flat on the table, the other wing tip should be approximately 2" off of the surface of the table. If this need to be adjusted, you may do so by sanding small amount from the center ribs or dihedral brace.

6) To protect the covering from the epoxy used to glue the wing halves together, carefully apply masking tape around the edge of the root rib on the top and bottom of each wing half. **See photo #3 below.**



7) Mix a generous amount of 30 minute epoxy. Coat the exposed half of the dihedral brace, the wing joiner box and both root ribs with epoxy. Slide the two wing halves together and carefully align them at the leading and trailing edges. Wipe away any excess epoxy using paper towels. Use masking tape wrapped around the center section to hold the halves in place until the epoxy cures. **See photo # 4below.**

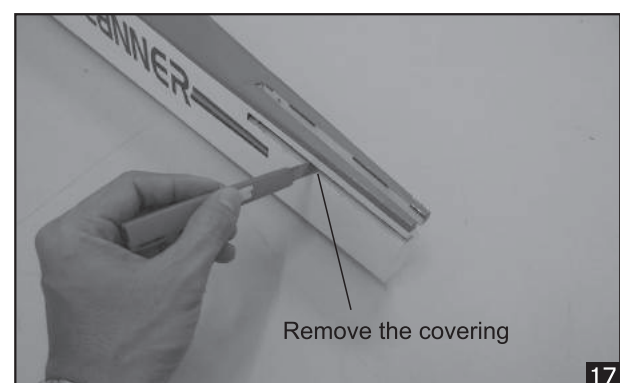


8) When the epoxy has cured, carefully remove the masking tape from the wing.

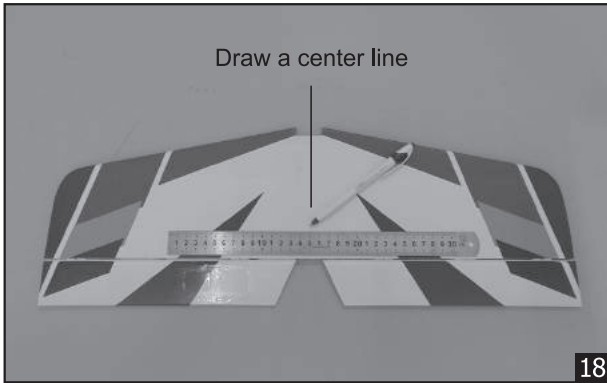
9) Peel off the backing from the self adhesive covering strip used to cover the center section wing joint seam. Apply the strip to the center section of the wing on the bottom first, and the top using the rest of the material.

## INSTALLING THE HORIZONTAL STABILIZER

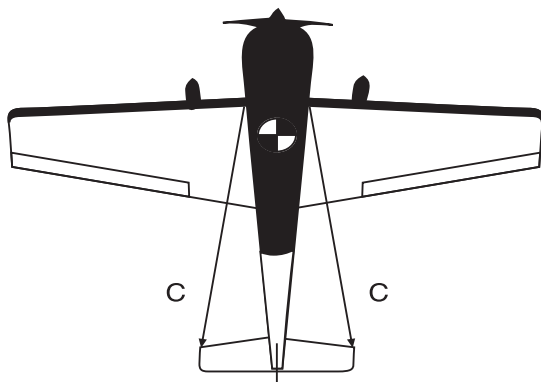
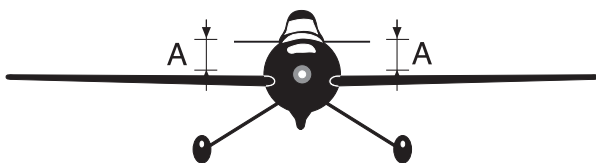
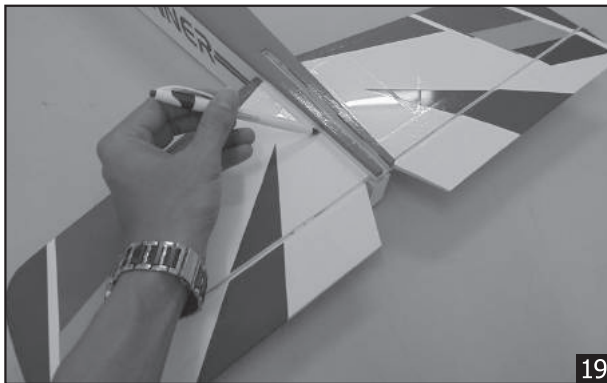
1. Using a modeling knife, cut away the covering from the fuselage for the stabilizer and remove it.



2. Draw a center line onto the horizontal stabilizer.



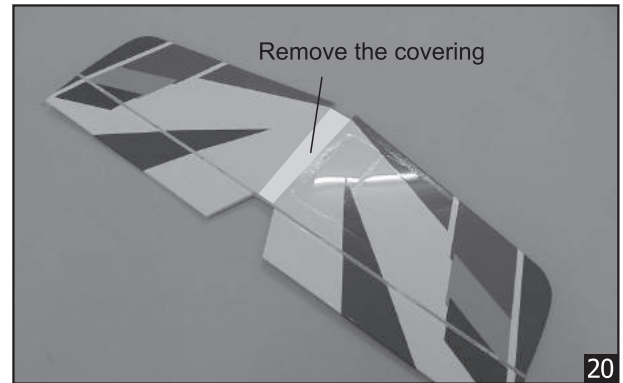
3. Check the fit of the horizontal stabilizer in its slot. Make sure the horizontal stabilizer is square and centered to the fuselage by taking measurements, but don't glue anything yet.
4. With the horizontal stabilizer correctly aligned, mark the shape of the fuselage on the top and bottom of the tail plane using a water soluble / non-permanent felt-tip pen.



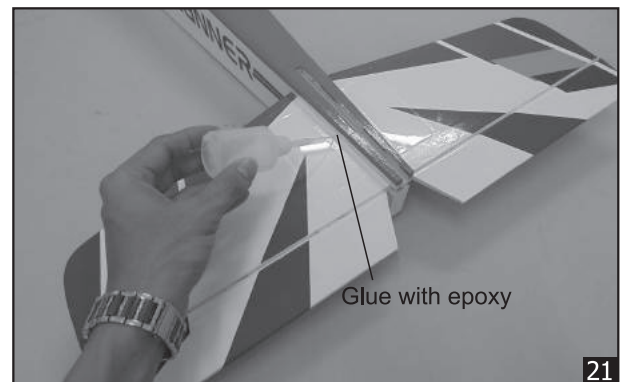
5. Remove the stabilizer. Using the lines you just drew as a guide, carefully remove the covering from between them using a modeling knife.



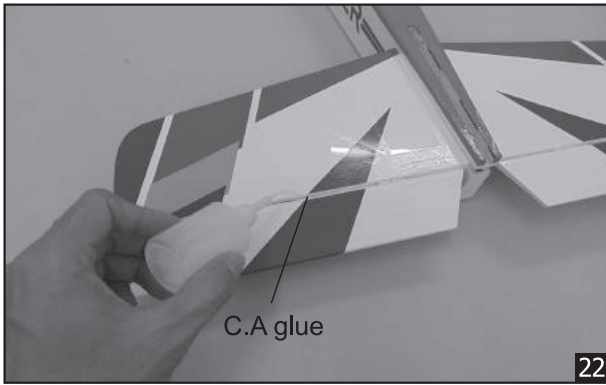
*When cutting through the covering to remove it, cut with only enough pressure to only cut through the covering it's self. Cutting into the balsa structure may weaken it. This could lead to possible failure during flight.*



6. When you are sure that everything is aligned correctly, mix up a generous amount of 30 minute epoxy. Apply a thin layer to the top and bottom of the stabilizer mounting area and to the stabilizer mounting platform sides in the fuselage. Slide 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.

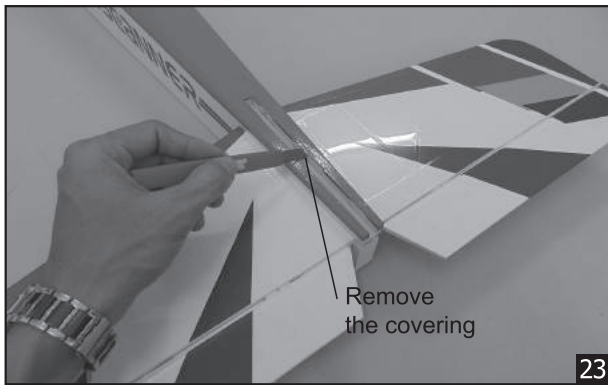


7. After the epoxy has fully cured, remove the masking tape or T-pins used to hold the stabilizer in place and carefully inspect the glue joints. Use more epoxy to fill in any gaps that were not filled previously and clean up the excess using a paper towel and rubbing alcohol.
8. Installing the elevator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



**INSTALLING THE VERTICAL STABILIZER**

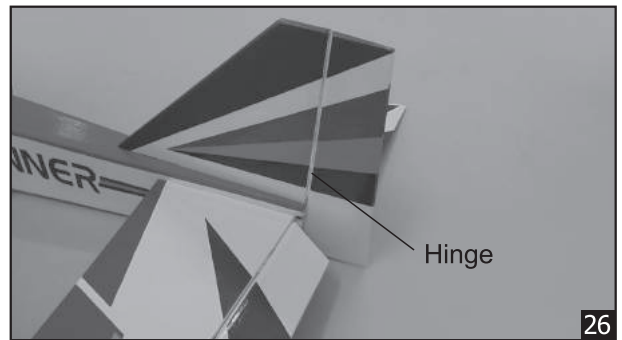
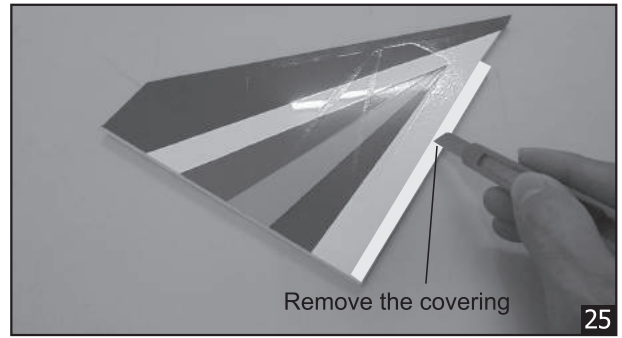
1. Using a modeling knife, remove the covering on the top of the fuselage for the vertical stabilizer.



2. Slide the vertical stabilizer into the slot in the mounting platform in the top of the fuselage. Mark the shape of the fuselage on the left and right sides of the vertical stabilizer using a felt-tip pen.



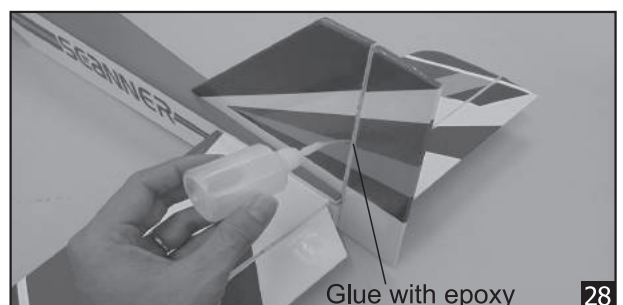
3. Now, remove the vertical stabilizer and using a modeling knife, carefully cut just inside the marked lines and remove the film on both sides of the vertical stabilizer. Just as you did with the horizontal stabilizer, make sure you only press hard enough to cut the film, not the balsa vertical stabilizer.



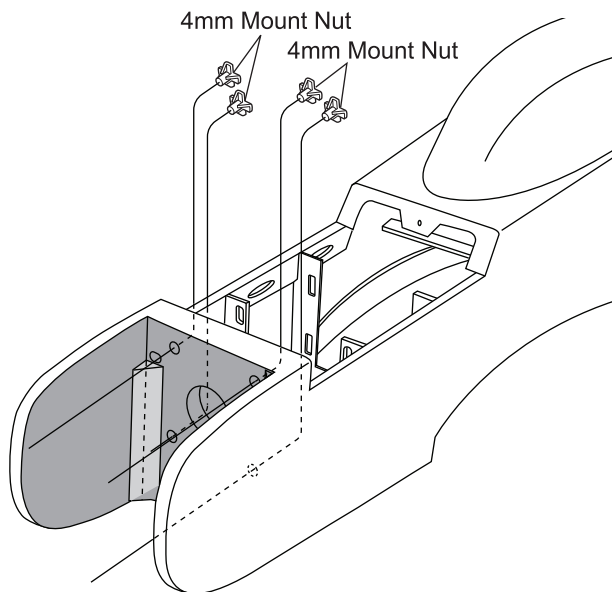
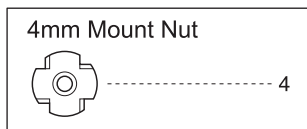
4. Slide the vertical stabilizer back in place. Using a triangle, check to ensure that the vertical stabilizer is aligned 90 degree to the horizontal stabilizer.
5. When you are sure that everything is aligned correctly, mix up a generous amount of 30 minute epoxy. Apply a thin layer to the slot in the mounting platform and to the vertical stabilizer mounting area. Apply epoxy to the lower rudder hinge. Set the stabilizer in place and re-align. Double check all of your measurements once more 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. Allow the epoxy to fully cure before proceeding.



6. Installing the rudder using C.A glue as installing the aileron.



**INSTALLING THE ENGINE MOUNT**



**ENGINE MOUNTING**

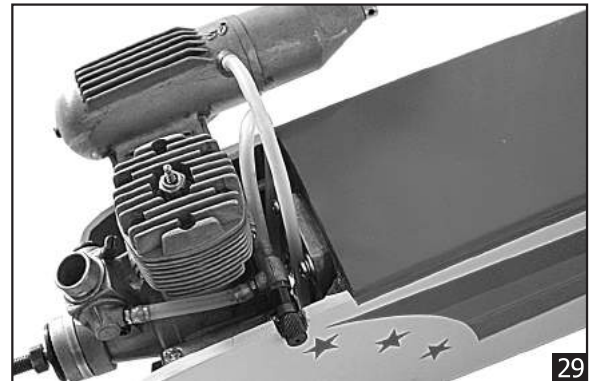
1) Test fit your engine into the engine mount. Because the width of different engines differ, the motor mount may need to be widened to accommodate your engine. You can do this by loosening the motor mount screw and sliding the mounting beams apart. When satisfied with the fit, tighten the mounting screws.

2) Remove the muffler from the engine and set the engine in the mount. Adjust the depth of the engine in the mount. The front of the thrust washer should be 5/16" forward of the front edge of the fuselage sides. This will allow clearance for the propeller.

3) Once satisfied with the fit of the engine, mark the position of the four engine mounting holes onto the mount. Remove the engine and drill out the mounting holes using a 7/64" drill bit. Drill one hole at a time, checking the alignment after each hole is drilled.

4) When reinstalling the engine into the motor mount, connect the carburetor arm to the preinstalled throttle pushrod. The Z-Bend fits into the lower hole in the throttle arm. Mount the engine using the four 3\*25mm flat head wood screws. **See photo #11 below.**

4) When reinstalling the engine into the motor mount, connect the carburetor arm to the preinstalled throttle pushrod. The Z-Bend fits into the lower hole in the throttle arm. Mount the engine using the four 3\*25mm flat head wood screws. **See photo #11 below.**



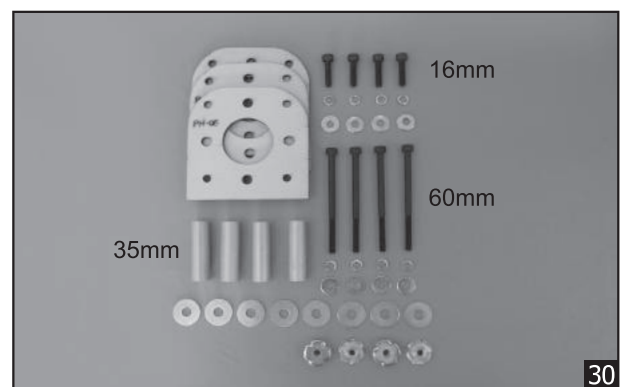
5) Mount the muffler to the engine using the mounting bolts provided with your engine.

**INSTALLING THE MOTOR AND BATTERY**

Installing the electric motor

This model can fly with electric, here is our recommended for set up the system.

- Motor brushless: Rimfire .46
- Lipo cells: 4-6 cells / 4000 - 5000 mAh.
- ESC: 50A - 70A.





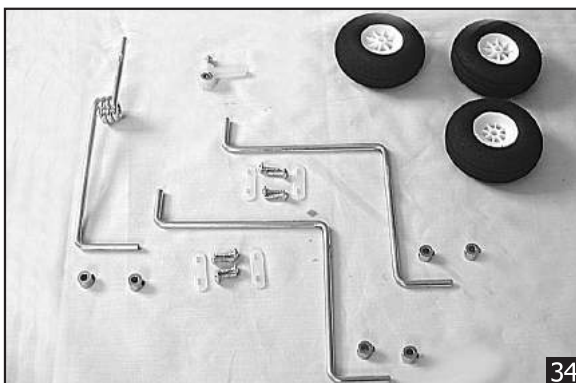
32



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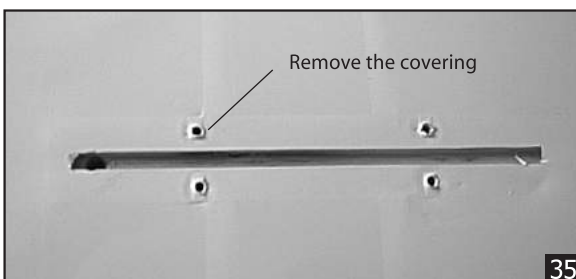
**LANDING GEAR INSTALLATION**

1) Locate the two main landing gear wires, one nose gear wire, four nylon mounting straps eight 3\*12mm Phillips head sheet metal screws, three wheels, six wheel collars w/set screws, and one nylon steering arm with set screw. **See photo #12 below.**



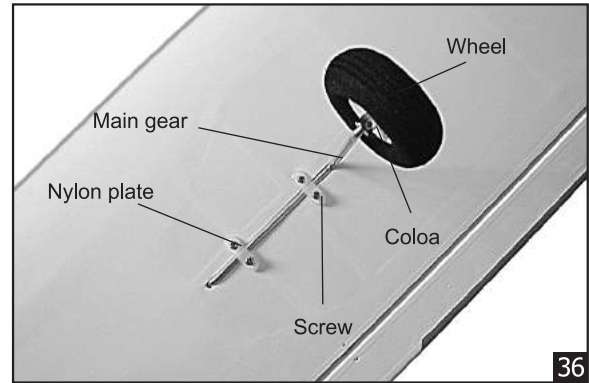
34

2) There are two hardwood landing gear blocks with one precut channel in each block in the bottom of the wing. Locate the two landing gear blocks on the bottom of the wing and using a modeling knife, remove the covering from over the precut channels. **See photo #13 below.**



35

3) Test fit the two main gear wires into the channels. When satisfied with the fit, secure the wires in place using the four nylon straps and eight 3\*12mm sheet metal screws. If you look closely at the wing surface surrounding the channel for the wire, you will notice that there are already four pilot holes drilled to accommodate the screws for the straps. Mount the straps at these locations. **See photo # 14 below.**

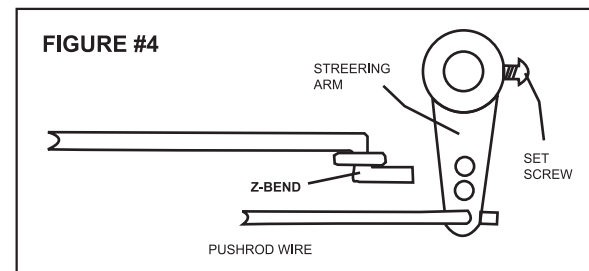


36

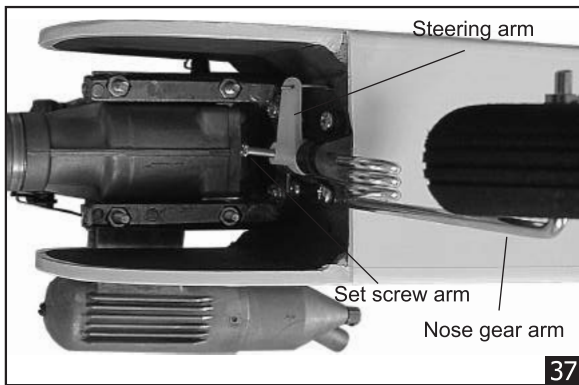
4) Install two of the wheels onto the axles using the four wheel collars and set screws provided. The wheels should be centered on the axles with a wheel collar on each side, holding them in place. Tighten the set screws on the collars to secure them in place. The wheels should rotate freely. You should apply a small drop of lock-Tite thread lock to each set screw to prevent them from coming loose.

5) Remove the hatch cover from the bottom front of the fuselage. Working with the preinstalled nylon steering housing, position it so the end of it is flush with the front of the firewall. When satisfied with the fit, glue the housing to the firewall from the inside of the fuselage using 5 Minute Epoxy.

6) The preinstalled wire steering pushrod has a factory made Z-Bend on the front end of it. Connect the nylon steering arm to this pushrod. The pushrod should be installed in the outermost hole in the steering arm. **See figure # 4 below.**



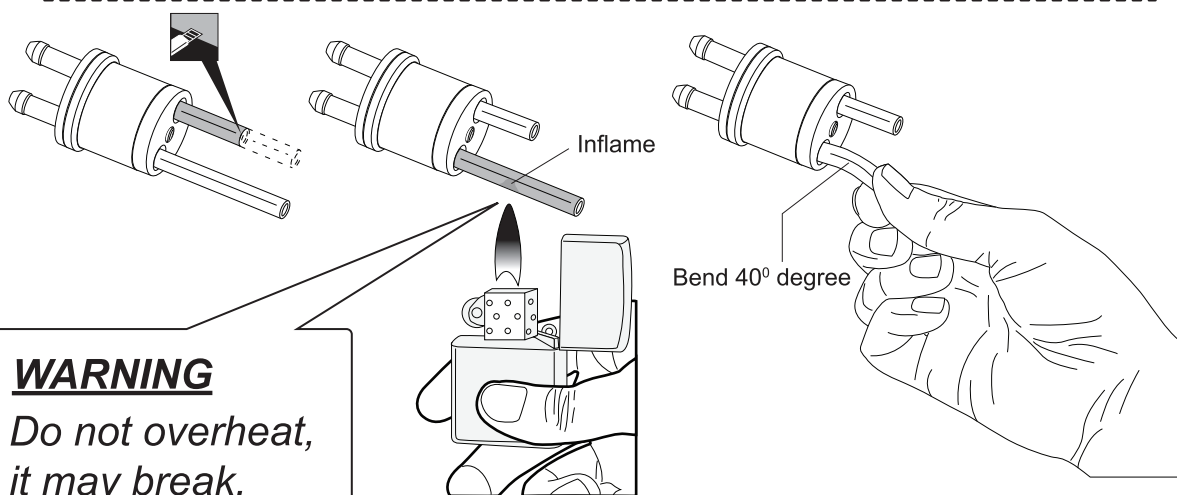
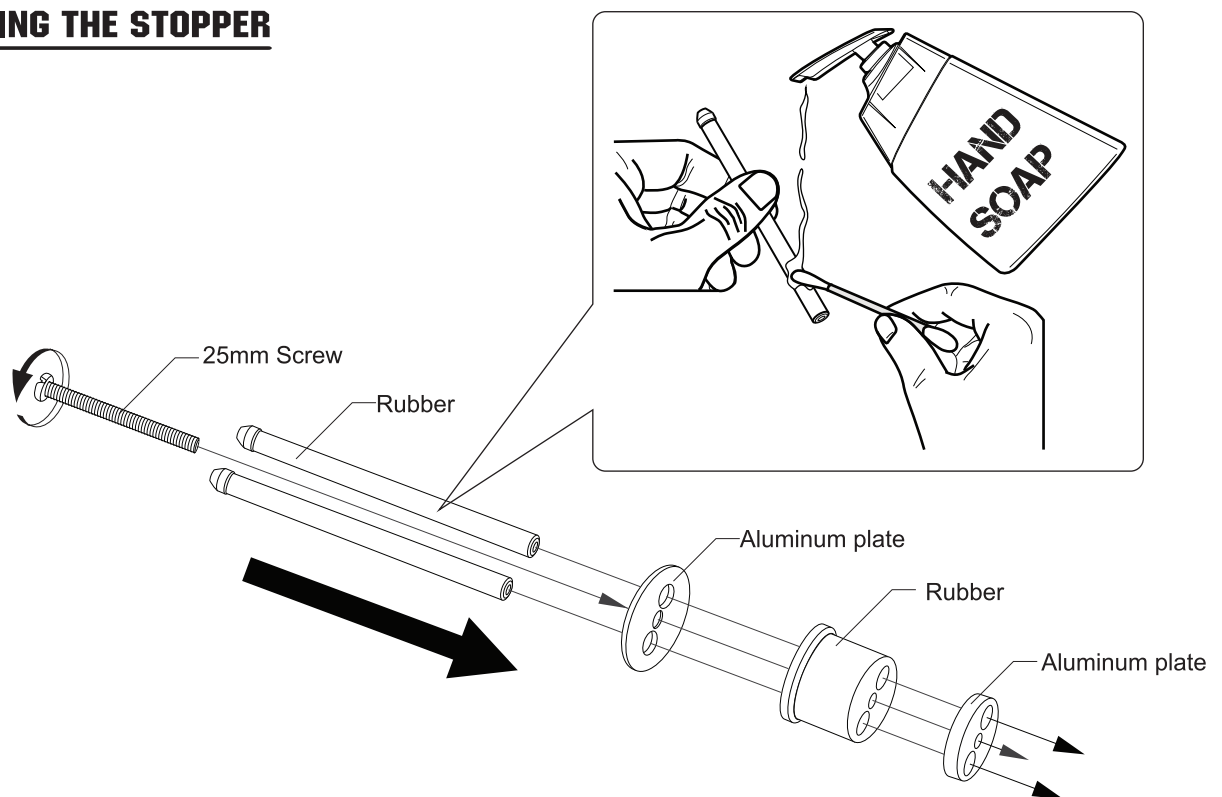
7) Locate the nose gear wire. Slide the nose gear wire up through the lower portion of the nose gear block, then through the nylon steering arm, then through the upper portion of the nose gear block. The top of the nose gear wire should be flush with the top of the nose gear bracket. **See photo # 15 below.**



8) With the nose gear wire straight, angle the nylon steering arm about 30° forward of the fire-wall and tighten the set screw. Angling the arm forward like this will allow room for the arm to move back for more adequate steering.

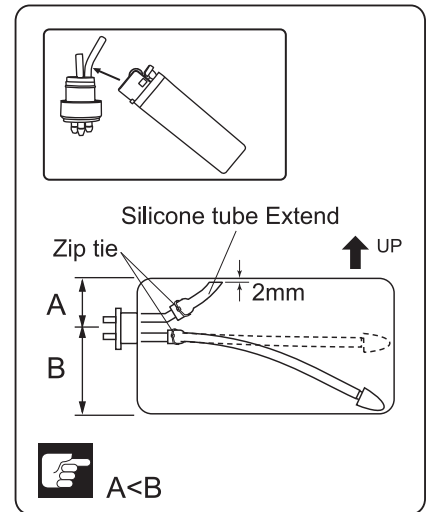
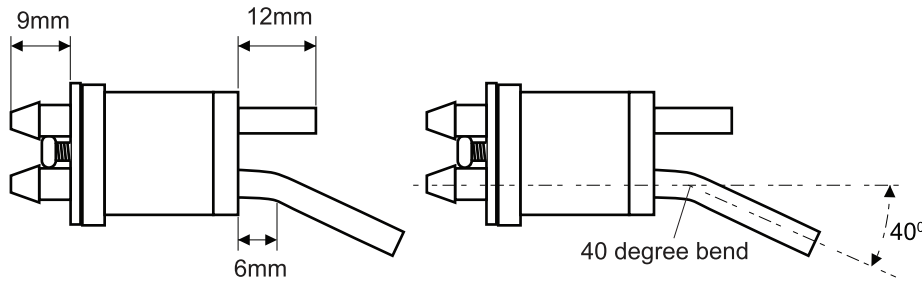
9) Install the remaining wheel onto the axle using the two wheel collars and set screws provided. The wheel should be centered on the axle with a wheel collar on each side, holding it in place. Tighten the set screws on the collars to secure them in place. The wheel should rotate freely. You should apply a small drop of Lock\_tite thread lock to each set screw to prevent them from coming loose.

**INSTALLING THE STOPPER**



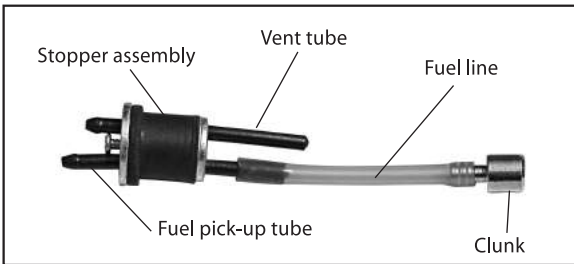
**! WARNING**  
Do not overheat,  
it may break.

Cut off shaded portion



**FUEL TANK ASSEMBLY**

1) Locate the plastic molded fuel tank, preassembled stopper assembly, weighted pick-up and a length of fuel line about 2-1/2 " long (not included). For steps # 2-4, **refer to photo #16 below.**



2) Attach the weighted pick-up, more com-momly referred to as the "clunk", to one end of the silicon fuel line.

3) Slide the other end of the silicon fuel line onto the end of one of the tubes coming out of the rear of the stopper assembly. This will be your fuel pickup line. When mounted the clunk should rest 3/8" from the rear of the tank and should move freely within the tank. The silicon tubing should be trimmed to fit.

4) Using your Fingers, gently bend the second tube upwards. This will become the muffler pressure tube. When inside the tank, it should rest just within the bubble in the top of the tank's roof.

5) Push the stopper assembly into the opening in the tank. Adjust the assembly until the muffler pressure tube is resting in the top of the bubble in the tank, but not touching the bubble. The fuel pick-up should also be 3/8" from the back of the tank. When satisfied with the fit, insert the long machine screw through the center hole in the stopper. Tighten the screw to expand the stopper and seal the tank opening. Tighten the stopper only enough to make a good seal. If you over-tighten the stopper, you may accidentally crack the front of the tank.

6) Mix up a batch of 30 Minute Epoxy and using an small pain brush, completely coat the inside of the fuel tank compartment in the forward section of the fuselage. This will seal the wood from any fuel that might accidentally leak from the tank.

7) When the epoxy has cured, connect two lengths of fuel line to the plastic tubes coming out of the tank. Keep track which one is for the fuel pick-up and which one is for the muffler pressure.

8) Run the tubes through the hole in the firewall and slide the tank assembly into place. The tank should rest at the top of the compartment and be up against the back of the firewall. Make sure there are no kinks in the fuel tubing and that the bubble in the tank is towards the top of the airplane.

9) Use pieces of the foam provided to hold the tank in place. Be careful the tank or the foam doesn't interfere with the pushrods.

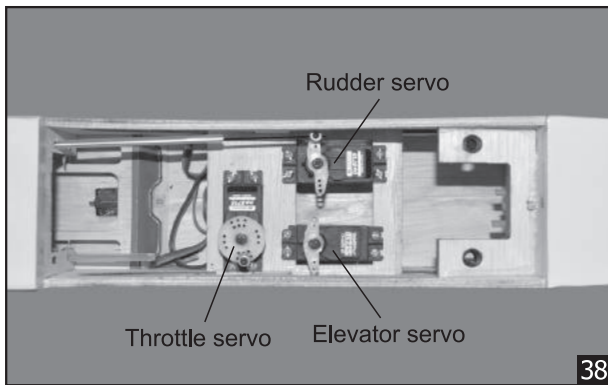
10) Connect the fuel pick-up line to the carburetor fuel inlet nipple and the muffler pressure line to the pressure nipple on your engine's muffler.

**SERVO INSTALLATION**

**INSTALLING THE FUSELAGE SERVOS**

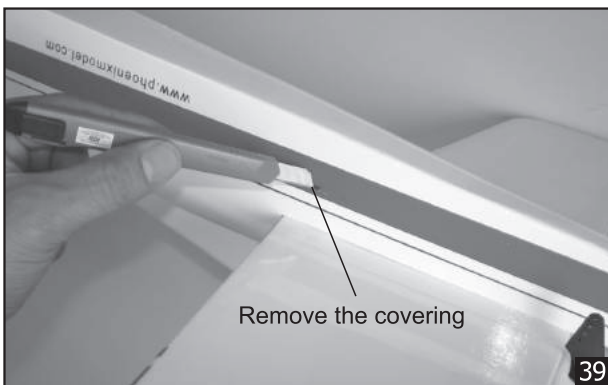
1. Install the rubber grommets and brass collets into the elevator, rudder and throttle servos. Test fit the servos into the servo tray. Trim the tray if necessary to fit your servos
2. Mount the servos to the tray using the mounting screws provided with your radio system.



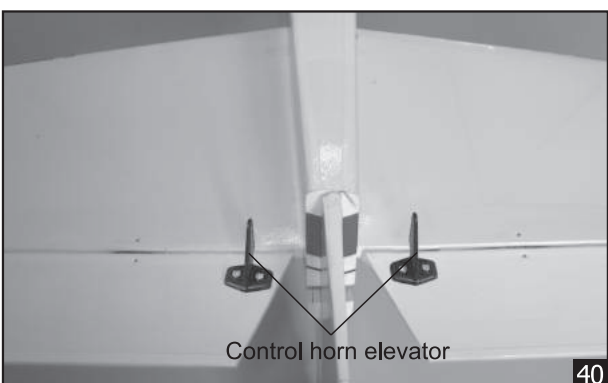


**INSTALLING THE ELEVATOR PUSHROD**

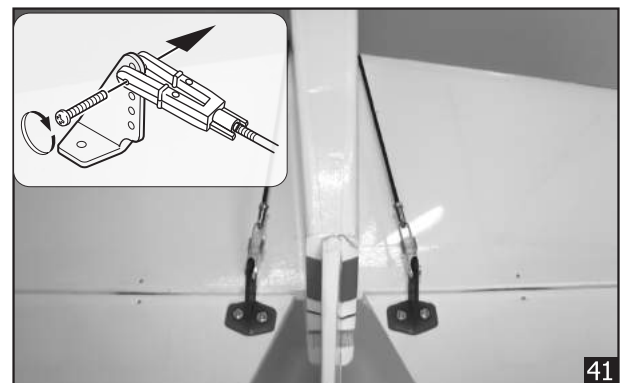
1. Locate the pushrod exit slot on the right side and left side of the fuselage. It is located slightly ahead and below the horizontal stabilizer.
2. Carefully cut away the covering material from the slot.



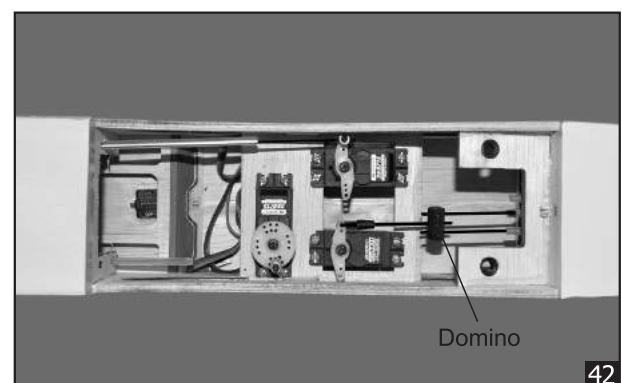
3. Working from inside the fuselage, slide the threaded end of the pushrod until it reaches the exit slot. Carefully reach in with a small screw driver and guide the pushrod out of the exit slot.
4. Install the clevis on the elevator pushrod. Make sure 6mm of thread shows inside the clevis.
5. The control horn should be mounted on the bottom, left side and right side of the elevator at the leading edge, in line with the elevator pushrod.
6. Drill two holes through the elevator using the control horn as a guide and screw the control horn in place.



7. Attach clevis to the third hole in the control horn.

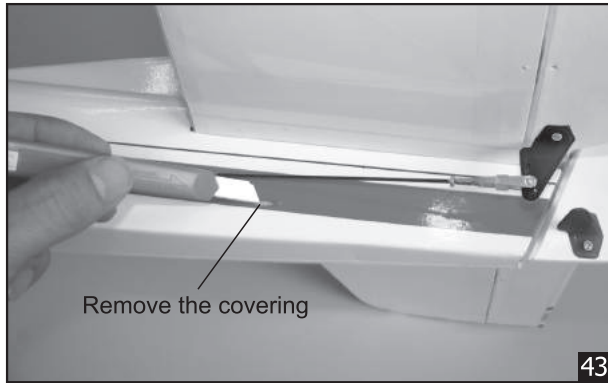


8. Locate one nylon servo arm, and using wire cutters, remove all but one of the arms. Using a 2mm drill bit, enlarge the third hole out from the center to accommodate the elevator pushrod wire.
9. Plug the elevator servo into the receiver and center the servo. Install the servo arm onto the servo. The servo arm should be perpendicular to the servo and point toward the middle of the fuselage.
10. Be sure both elevator halves are flat. Center both elevator halves and hold them in place using a couple of pieces of masking tape.
11. Connect two elevator pushrod to the domino connector and secure it. Insert the wire pushrod into the domino connector and secure it.
12. With the elevator halves and elevator servo centered, carefully place a mark on the elevator pushrod wire where it crosses the hole in the servo arm.
13. Using pliers, carefully make a 90 degree bend up at the mark made. Cut off the excess wire, leaving about 8mm beyond the bend.
14. Insert the 90 degree bend up through the hole in the servo arm, install one nylon snap keeper over the wire to secure it to the arm. Install the servo arm retaining screw and remove the masking tape the elevator halves.
15. Using thick CA glue, secure the pushrod sleeves to the pushrod sleeve guide.



### INSTALLING THE RUDDER PUSHROD

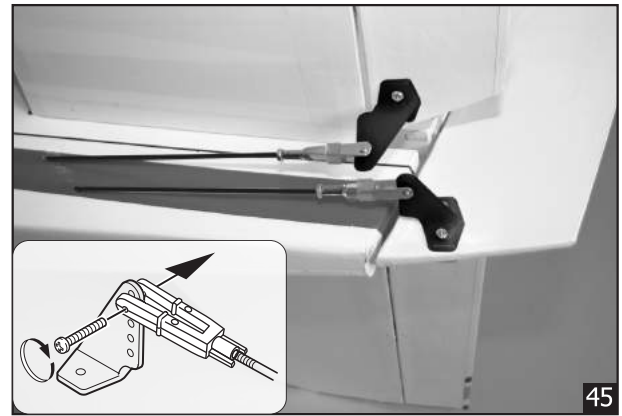
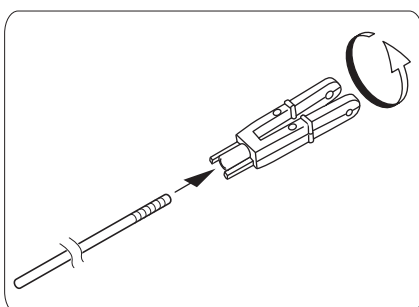
1. Locate the pushrod exit slot on the left of the fuselage.
2. Carefully cut away the covering material from the slot.



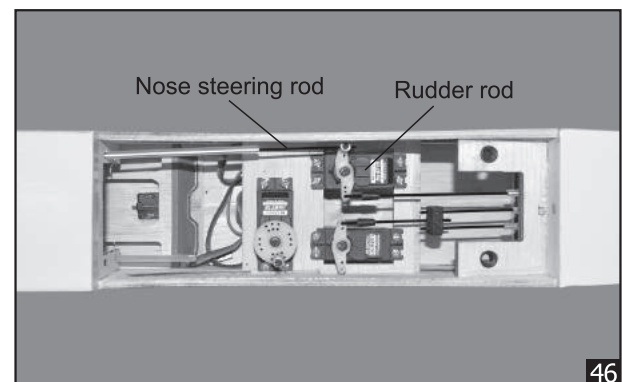
3. Working from inside the fuselage, slide the threaded end of the remaining pushrod down the inside of the fuselage until the pushrod reaches the exit slot. Carefully reach in with a small screw driver and guide the pushrod out of the exit slot.
4. Install the clevis on the rudder pushrod. Make sure 6mm of thread shows inside the clevis.
5. The control horn should be mounted on the left side of the rudder at the leading edge, in line with the rudder pushrod.
6. Drill two holes through the rudder using the control horn as a guide and screw the control horn in place.



7. Attach clevis to the third hole in the control horn.



8. Locate one nylon servo arm, and using wire cutters, remove all but one of the arms using a 2mm drill bit, enlarge the third hole out from the center to accommodate the rudder pushrod wire.
9. Plug the rudder servo into the receiver and center the servo. Install the servo arm onto the servo.
10. Center the rudder and hold it in place using a piece of masking tape.
11. With the rudder and rudder servo centered, carefully place a mark on the rudder pushrod wire where it crosses the hole in the servo arm.
12. Using a pliers, carefully make a 90 degree bend up at the mark made. Cut off excess wire, leaving about 8mm beyond the bend.
13. Insert the 90 degree bend up through the hole in the servo arm. Install one nylon snap keeper over the wire to secure it to the arm. Install the servo arm retaining screw and remove the masking tape from the rudder.
14. Using thick CA glue, secure the pushrod sleeves to the pushrod sleeve guide.



**RECEIVER & BATTERY INSTALLATION**

1) The battery should be wrapped in foam and mounted under the fuel tank to add in balancing. We used a 500mah flat pack. The receiver should be wrapped in foam and mounted just behind the fuel tank.

2) Uncoil the receiver antenna completely and drill a 1/16" hole in the side of the fuselage, opposite the muffler, for the antenna to exit. Secure the end of the antenna to the top the vertical fin using a rubber band or similar method.

3) Install the switch on the side of the fuselage opposite the muffler. Use the faceplate of the switch as a pattern for drilling the holes and the cutout for the switch itself.

**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 2-1/2" back from the leading edge of the wing at the fuselage sides. This location is recommended for initial test flying and trimming. There is a 3/8" margin forward and aft, but it is not recommended that the center of gravity be located any further back than 2-7/8". Balance the Scanner with the fuel tank empty.

2) Using a couple of pieces of masking tape or a pen, make a mark on each side of the top of the wing 2-1/2" back from the leading edge.

3) If the nose of the plane falls, the plane is nose heavy. To correct this, try moving your battery pack back. If that is not enough change, add a little lead weight to the tail. If the tail of the plane falls, double check that you have mounted the battery pack under the fuel tank. If the airplane is still tail heavy add lead weight to the firewall or even better, use a sufficient heavy hub under the spinner.

**CONTROL THROWS**

● **LOW RATE**

Ailerons : 11 mm up	11 mm down
Elevator: 11mm up	11 mm down
Rudder : 25 mm right	25 mm left

● **HIGH RATE**

Ailerons : 14 mm up	14 mm down
Elevator: 14mm up	14 mm down
Rudder : 40 mm right	40 mm left

**FLIGHT PREPARATION**

1) Check the operation and direction of the elevator, rudder, ailerons and throttle.

A) Plug in your radio system per the manufacturer's instructions and turn everything on.

B) Check the elevator first. Pull back on the elevator stick. The elevator should go up. If it does not, flip the servo reversing switch on your transmitter to change the direction.

C) Check the rudder. Looking from behind the airplane, move the rudder stick to the right. The rudder should move to the right. The nose wheel should move to the right as well. If it does not, flip the servo reversing switch on your transmitter to change the direction.

D) Check the throttle. Moving the throttle stick forward should open the carburetor barrel. If it does not, flip the servo reversing switch on your transmitter to change the direction.

E) From behind the airplane, look at the aileron on the right wing. Move the aileron stick to the right. The aileron should move up and the other aileron should move down. If it does not, flip the servo reversing switch on your transmitter to change the direction.

2) Check Control Surface Throw.

A) The rudder should move 1/2" left and 1/2" right from center.

B) The elevator should move 3/8" up and 3/8" down from center.

C) The aileron should move 3/8" up and 3/8" down from center. If they move too far, move the adjustable horn away from the aileron a few turns. Do the opposite if there is not enough throw. It is important that both ailerons move the same amount, both up and down.

D) Once the control throws and movements are set, tubing must be added to the clevises to ensure they do not release in the air. Cut 1/4" lengths of fuel tubing and slide one over each clevis prior to attaching it to the control horn. This will ensure the clevis will not release in flight.

## **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 Scanner to ensure everything is tight and well bonded.
- 3) Check that the tubes used for clevis retainers are in place.
- 4) Double check the balance of the airplane. Do this before filling the tank with fuel.
- 5) Check the control surfaces. All should move in the correct direction and not bind in any way.
- 6) Check the receiver antenna. It should be fully extended and not still coiled up in the fuselage.

## **FLYING THE SCANNER**

If you are unfamiliar with flying low wing sport aircraft, please seek out an experienced pilot to help you with the first few flights of the airplane. The design of the Scanner allows the airplane to fly smoothly and stable, yet perform good aerobatics as well. Landings are smooth and predictable, but because this is not a primary trainer, its stall speed is higher and power should be used to bring it in for landings and slow speed flight. It does not have the self-recovery characteristics of a primary R/C trainer, so again, if you don't feel comfortable for the first flight have someone with more experience help you get it in the air.

Although this model has good low speed characteristics with power on, you should always build up as much speed as your runway will permit before lifting off, as this will give you a safety margin in case the engine quits after take off.

It is important that the plane rolls out on the ground until sufficient airspeed is achieved. Pulling the Scanner off the ground too soon could result in a stall and crash. Allow the airplane to pick up speed and gently lift off and climb out gradually. We recommend that you take it easy with your Scanner for the first several flights, gradually getting acquainted with the air plane and allowing your engine to fully break-in.

Add and practice one maneuver at a time, learning how the airplane behaves in each. For smooth flying and normal maneuvers, we recommend using the low rate settings described earlier, High rate may be required for more crisp aerobatics. Before your first landing, practice landing approaches in the air. This will get you familiar with the stall characteristics of the Scanner.

When it's time to land, fly a normal landing pattern and approach decreasing power to about one-quarter. It is important that when power is reduced and flying speed has diminished, do not make high angle turns onto the final approach. Too high an angle of bank with too little power can cause the airplane to stall. When you turn final, reduce power to just a few clicks over idle. When you are a few feet off the ground, reduce power to idle and let the airplane settle onto the runway. Land slightly faster than the stall speed and on the main wheels, as this is the easiest way to land the Scanner and will reduce the risk of stalling the airplane.

## **SPINNER INSTALLATION**

- 1) Locate the molded plastic spinner, two 3\*12mm Phillips head sheet metal screws and the Propeller to suit your engine (not included).
- 2) Most .40 size displacement engines use a 1/4" diameter crankshaft. You may need to enlarge the hole in the spinner backplate and the propeller to fit the crankshaft. If you do, enlarge the holes using a prop reamer or a 1/4" size drill bit.
- 3) Slide the backplate, then the propeller onto the engine and secure in place with the prop washer and nut included with your engine.
- 4) Install the spinner cone onto the spinner backplate using the two 3\*12mm Phillips head sheet metal screws. You will need to trim the openings in the spinner cone to clear the propeller. Trim the opening using a sharp modeling knife until the spinner cone clears the propeller. It is important that no part of the spinner cone touches the propeller.

